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RESEARCH

SELF-CONFIDENCE AND SATISFACTION OF NURSING STUDENTS IN EMERGENCY SIMULATION

AUTOCONFIANÇA E SATISFAÇÃO DOS ESTUDANTES DE ENFERMAGEM EM SIMULAÇÃO DE EMERGÊNCIA

AUTOCONFIANZA Y SATISFACCIÓN DE ESTUDIANTES DE ENFERMERÍA EN SIMULACIÓN DE EMERGENCIAS

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ABSTRACT

Objective: to compare self-confidence for Nursing evaluation and intervention in simulated emergency clinical settings and to verify the satisfaction of Nursing students in participating in the method. ***Methods:*** this is single-arm, longitudinal intervention research of before and after type, conducted with 35 Nursing students from a public university in southern Brazil. The intervention was a high-fidelity simulation using the National League Nursing/Jeffries Simulation Theory model in five emergency clinical scenarios with a progressive level of complexity that included the evaluation and intervention in the neurological, respiratory and cardiac areas. Outcome measurements were performed using the Self-Confidence Questionnaire and the Satisfaction Scale with Simulated Clinical Experiences. ***Results:*** the comparison of results showed a significant increase ($p < 0.05$) in the acquisition of self-confidence for evaluation and intervention in simulated clinical cases of emergency, in the neurological ($p = 0.0073$ and $p = 0.0431$), respiratory (values between $p < 0.0001$ and $p = 0.0060$) and cardiac (values between $p < 0.0001$ and $p = 0.0494$). The average satisfaction score was 8.4 points out of a maximum of 10.0, indicating a high degree of satisfaction with the experiences. ***Conclusions:*** the simulated clinical scenarios with an increasing level of complexity promoted an increase in self-confidence for Nursing assessment and intervention, and from that self-confidence, the students felt competent and satisfied because they were able to evaluate and intervene in the clinical situations presented and, therefore, it is possible to infer that they felt prepared for the real clinical experience.

Keywords: Trust; Personal Satisfaction; High Fidelity Simulation Training; Education, Nursing; Students, Nursing; Emergency Nursing.

RESUMO

Objetivo: *comparar a autoconfiança para avaliação e intervenção de enfermagem em cenários clínicos simulados de emergência e verificar a satisfação dos estudantes de Enfermagem em participar do método.* ***Métodos:*** *pesquisa de intervenção, de braço único, longitudinal do tipo antes e depois, realizado com 35 estudantes de Enfermagem de uma universidade pública do Sul do Brasil. A intervenção foi a simulação de alta fidelidade utilizando o modelo da National League Nursing/Jeffries Simulation Theory em cinco cenários clínicos de emergência com nível progressivo de complexidade que incluíram a avaliação e intervenção nas áreas neurológica, respiratória e cardíaca. A mensuração dos desfechos foi realizada mediante o Self Confidence Questionnaire e a Escala de Satisfação com as Experiências Clínicas Simuladas.* ***Resultados:*** *a comparação dos resultados demonstrou significativo aumento ($p<0,05$) na aquisição de autoconfiança para avaliação e intervenção em casos clínicos simulados de emergência, nas áreas neurológica ($p=0,0073$ e $p=0,0431$), respiratória (valores entre $p<0,0001$ e $p=0,0060$) e cardíaca (valores entre $p<0,0001$ e $p=0,0494$).*

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O escore de satisfação médio foi de 8,4 pontos, do máximo de 10,0, indicando elevado grau de satisfação com as experiências vivenciadas. ***Conclusões:*** *os cenários clínicos simulados em nível crescente de complexidade promoveram aumento da autoconfiança para avaliação e intervenção de enfermagem, e a partir dessa autoconfiança os estudantes se sentiram competentes e satisfeitos porque conseguiram avaliar e intervir nas situações clínicas apresentadas e, portanto, pode-se inferir que se sentiram preparados para a experiência clínica real.*

Palavras-chave: *Confiança; Satisfação Pessoal; Treinamento com Simulação de Alta Fidelidade; Educação em Enfermagem; Estudantes de Enfermagem; Enfermagem em Emergência.*

RESUMEN

Objetivo: *comparar la autoconfianza para la evaluación e intervención de enfermería en entornos clínicos de emergencia simulados y verificar la satisfacción de los estudiantes de enfermería al participar en el método.* ***Métodos:*** *investigación de intervención, brazo único, tipo longitudinal antes y después, realizada con 35 estudiantes de enfermería de una universidad pública del sur de Brasil. La intervención fue una simulación de alta fidelidad utilizando el modelo de la National League Nursing / Jeffries Simulation Theory en cinco escenarios clínicos de emergencia con un nivel progresivo de complejidad que incluyó evaluación e intervención en las áreas neurológica, respiratoria y cardíaca. Se utilizaron el Cuestionario de autoconfianza y la Escala de satisfacción con experiencias clínicas simuladas para la medición de resultados.* ***Resultados:*** *la comparación de resultados mostró un aumento significativo (p <0.05) en la adquisición de autoconfianza para la evaluación e intervención en casos clínicos simulados de emergencia, en lo neurológico (p = 0.0073 yp = 0.0431), respiratorio (valores entre p <0,0001 yp = 0,0060) y cardíaco (valores entre p <0,0001 yp = 0,0494). La puntuación media de satisfacción fue de 8,4 puntos, de un máximo de 10,0, lo cual indica un alto grado de satisfacción con las experiencias.* ***Conclusiones:*** *los escenarios clínicos simulados con un nivel de complejidad creciente promovieron aumento de la autoconfianza para la evaluación e intervención de enfermería, y a partir de esa autoconfianza los estudiantes se sintieron competentes y satisfechos porque fueron capaces de evaluar e intervenir en las situaciones clínicas presentadas y, por lo tanto, se puede deducir que se sintieron preparados para la experiencia clínica real.*

Palabras clave: *Confianza; Satisfacción Personal; Enseñanza Mediante Simulación de Alta Fidelidade; Educación en Enfermería; Estudiantes de Enfermería; Enfermería de Urgencia.*

INTRODUCTION

Simulation-based teaching (SBT) has been used in undergraduate Nursing for years to acquire skills. It is a pedagogical method that uses educational techniques and/or technological equipment in an experience to faithfully represent reality and allows students to understand and apply the theoretical knowledge acquired in the classroom to their clinical Nursing practices.[1]

The use of this method encourages the student to question, express feelings, share difficulties and emotions, overcoming possible limitations in a safe environment and without putting their safety and that the patient´s safety at risk.[2]

The SBT contributes to critical and reflective teaching-learning and can improve knowledge, skills, and attitudes for care and assist students in the development of practice in controlled environments, enhancing their experiences.[3] Thus, this method can be used during the Nursing training process until the students acquire experience and security so that they feel safe and self-confident for the practice.[3]

Several studies assess the implications of SBT for Nursing and show that student participation in simulation scenarios can increase clinical skills, critical thinking, clinical reasoning, cognitive, psychomotor, behavioral, and clinical skills, andthe evaluation for clinical judgment and interpersonal development.[3,4] This teaching method also increasesthe self-confidence, promotes students' satisfaction with their learning, and prepares them for professional attitudes during the real-life experience, facilitating the transition from the classroom to the professional career.[1,3-6]

Self-confidence means security in oneself and the ability to successfully perform tasks. On the other hand, satisfaction can be interpreted as a feeling of gratification from an event and related to previous expectations.[7]

The measurement of self-confidence and satisfaction of Nursing students during the learning process is important and can be a strategy for evaluating the teaching and learning method.[8]

Different simulated clinical scenarios can measure Nursing students' self-confidence and satisfaction.[5,6,9,10] However, the literature is incipient in experimental and longitudinal research with simulated emergency clinical scenarios with a progressive level of complexity, especially in the neurological, cardiac, and respiratory areas. This fact motivated the conduct of this research because it is about clinical situations that require speed and efficiency in Nursing assessments and interventions.

Thus, this research aimed to compare self-confidence for Nursing evaluation and intervention in simulated emergency clinical settings and to verify the satisfaction of Nursing students in participating in the method.

METHOD

This is single-arm, longitudinal intervention research of before and after type, carried out in the high-fidelity clinical simulation laboratory of a public university in southern Brazil. The survey was conducted between the second half of 2015 and the first half of 2016.

Study population

The sample was for convenience. All undergraduate Nursing students enrolled in the sixth period of the course were invited to participate in the research. The inclusion criterion was being regularly enrolled in the adult and elderly health subject during the second semester of 2015 (n = 22) and the first semester of 2016 (n = 15). The exclusion criterion was that the student had a degree in health, considering that this prior knowledge could favor his self-confidence. The discontinuity criterion was that the student missed one or more simulations.

Study protocol

The students were divided into teams of four or five people and participated in five clinical scenarios of emergency simulation, with the high-fidelity human patient simulator METIman®, with several technological resources.Among them, there is the possibility of checking the level of awareness, eye-opening and pupillary evaluation, checking the carotid pulse, observation of chest elevation, cardiac monitoring, and also allows the practice of cardiopulmonary resuscitation with the opportunity to analyze the participant's ability regarding the effectiveness of interventions.

The scenarios were planned, implemented, and evaluated using the National League Nursing (NLN)/Jeffries Simulation Theory[11] model. The model has five elements: facilitators, participants, educational practices, design and simulation characteristics, and results.[12]

The first author was the **facilitator** in this research. He is a specialist in Cardiovascular Nursing, with clinical experience and advanced training in realistic simulation and who planned, implemented, observed, and evaluated the entire development of the clinical scenarios, and coordinated the three phases of the simulation: prebriefing/briefing, simulation experience, and debriefing. The facilitator knew the **profile of theparticipants** and also evaluated their previous knowledge to develop the learning objectives.

Educational practices during the clinical setting involved active and collaborative learning, feedback, and interaction between the facilitator and the student.

The researchers defined the **design** and **characteristics of the simulation** according to the learning objectives and the desired skills. The final element of the model is the **result** involving knowledge, skills, acquired satisfaction, critical thinking, and self-confidence.

The three phases of the simulation of the five scenarios were carried out according to the guidelines recommended by the authors and according to the protocols specifically developed for this research.

The prebriefing and briefing lasted seven minutes on average and provided students with an overview of the stages of the simulation and the opportunity to become familiar with the environment, the simulator, and the learning objectives. There were five simulation scenarios with a progressive level of complexity: a) CVA (stroke); b) congestive heart failure with arrhythmias (CHF); c) basic life support (BLS); d) advanced life support I (ALSI); e) advanced life support II (ALSII), with previously defined objectives, including technical and non-technical skills. The scenarios and objectives were based on Advanced Cardiology Life Support (ACLS)[13]. Each scenario was implemented in a single day for all students, with a standardized interval of approximately 20 days between each student.

After the briefing, all students had the experience of practical simulation and acted actively in the scenario, lasting 10 minutes, and there were no observers. After the end of each scenario, everyone participated in the debriefing, conducted with good judgment[12], lasting 15 minutes on average.

Before data collection, this research protocol was implemented as a pilot test to 15 Nursing students who met the profile of participants in this research and were not part of the sample.

Data collection and organization

The data were collected longitudinally in each simulation meeting (Figure 1), which corresponded to the simulated practical classes of the course's pedagogical project. Data collection was carried out from August to November for students enrolled in the second semester of 2015 (n = 22), and for those enrolled in the first half of 2016 (n = 15), it was held between March and June.

A semi-structured instrument developed by the researchers and applied before the first simulation characterized the participants. After each simulation experience, the Self-confidence scale[9] was applied to assess self-confidence, after students had participated in the five simulation scenarios, the satisfaction scale with the simulated clinical experiences was applied.[10]

The Self-confidence scale has 12 items that are divided into three dimensions, called: "neurological area", "respiratory area" and "cardiac area". Each item has five Likert-type answer options: (1) not confident, (2) not very confident, (3) confident, (4) very confident, and (5) extremely confident. It was translated, culturally adapted, and validated into Portuguese, obtaining Cronbach's alpha of 0.918.[9]

The satisfaction scale with the simulated clinical experiences has 17 items that are divided into three factors: practical dimension, realism dimension, and cognitive dimension.[14] The options for the answers include a Likert scale that varies from 1 (low level of satisfaction) to 10 (high level of satisfaction), and the higher the score, the better the level of satisfaction.[14]

The data were tabulated in Microsoft Excel® by two independent typists and validated against the two spreadsheets.

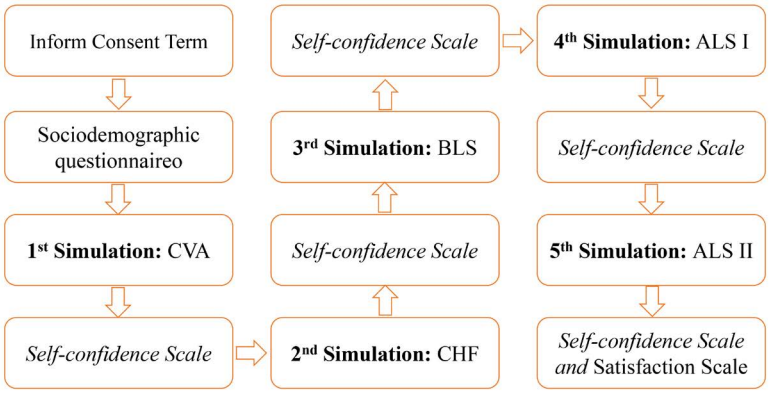

Figure 1 - Flowchart representing the five simulation and data collection scenarios

Data analysis

A statistical professional performed data analysis using the R® software. The data referring to the characterization of the participants and those from the scale of satisfaction with the simulated clinical experiences were analyzed using descriptive statistics (percentage, mean, standard deviation, minimum, and maximum values).

A linear model of mixed-effects analyzed the results from the Self-confidence scale, considering the assumption of normality for the residues.

The model used was represented by: $y_{ij} = \eta + \omega_i + \beta_j + \epsilon_{ij}$, as it is a dependent variable and represents the percentage of change from after to before, y_{ij} is the observation of the response variable in the question of the i-th individual, in the j-th simulation, η is a constant (an intercept); ω_i is a random effect of each individual i = 1,..., 35); β_j is the fixed effect of the j-th simulation (j = 1, ..., 5), estimating the difference in percentage for each simulation; and ϵ_{ij} is the error associated with the supposedly independent and identically distributed model with the normal distribution of zero mean and constant variance σ^2.[15]

Betweenthe simulations, multiple comparisons were performed using orthogonal contrasts. The statistical conclusions were taken considering a significance level of 5%.

Ethical aspects

The Research Ethics Committee involving Human Beings of a public university in the south of Brazil approved the research under opinion number 1,002,176, following Resolution 466/2012 of the National Health Council. All participants signed the Informed Consent Term in two copies. The authors authorized the use of the scale.

Results

A total of 37 students agreed to participate in the research; however, two participants were discontinued because they missed three consecutive simulations, totaling 35. Of these, 90.6% (n = 29) were female, with an average age of 23.6 years old and 97.1% (n = 34) had not completed another graduation.

When students' self-confidence for emergency evaluation and intervention was verified in each of the five simulation scenarios, we observed a progressive increase in the neurological area between simulation one and four (1: CVA x 4: ALS; p = 0.0073) and two and four (2: CHF x 4: ALS1; p = 0.0431) (Table 1).

In the respiratory area, there was a significant increase in the score between simulations one and two (1: CVA x 2: CHF; p = 0.0001), one and three (1: CVA x 3: BLS; p <0.0001), one and four (1: CVA x 4: ALS; p <0.0001), one and five (1: CVA x 5: ALS2; p <0.0001), two and three (2: CHF x 3: BLS; p = 0.0036), two and four (2: CHF x 4: ALS1; p = 0.0060) and two and five (2: CHF x 5: ALS2; p <0.0001).

In the cardiac area, except for simulations three and four (3: BLS x 4: ALS1; p = 0.9930) and four and five (4: ALSI x 5: ALSII; p = 0.0559), all others showed a significant increase in self-confidence.

Figure 2 shows the progressive and significant increase between simulation 1 and 4, with a decrease between 4 and 5 for the neurological area. In the respiratory area, there was a significant increase between simulations 1 and 3, followed by a slight decrease between 3 and 4 and a subsequent increase between 4 and 5. In the cardiac area, there was a progressive and significant increase between simulations 1 and 5.

The evaluation of students' satisfaction with the simulated clinical experiences, measured at the end of the fifth simulation had an overall average score of 8.4. The highest averages were in the cognitive and realism dimensions (Table 2).

Discussion

The results showed an increase in the student´s self-confidence related to Nursing evaluation and intervention in simulated emergency clinical cases, with a progressive level of complexity in the neurological, respiratory, and cardiac areas, and a positive impact on student´s satisfaction with the simulation-

Table 1 -Comparison between the five simulation scenarios for the self-confidence scores in the neurological, respiratory, and cardiac areas

Simulations	Neurological area n=35		Respiratory area n=35		Cardiac area n=35	
	Δ	p-value	Δ	p-value	Δ	p-value
1 (CVA) x 2 (CHF)	-0.2943	0.4770	-0.3857	0.0001*	-0.3457	0.0009*
1 (CVA) x 3 (BLS)	-0.5135	0.2264	-0.6804	<.0001*	-0.6923	<.0001*
1 (CVA) x 4 (ALSI)	-1.1728	0.0073*	-0.6687	<.0001*	-0.6932	<.0001*
1(CVA) x 5 (ALSII)	-0.6000	0.1653	-0.8240	<.0001*	-0.9088	<.0001*
2 (CHF) x 3 (BLS)	-0.2192	0.6047	-0.2947	0.0036*	-0.3466	0.0012*
2 (CHF) x 4 (ALSI)	-0.8786	0.0431*	-0.2829	0.0060*	-0.3475	0.0014*
2 (CHF) x 5 (ALSII)	-0.3057	0.4783	-0.4383	<.0001*	-0.5631	<.0001*
3 (BLS) x 4 (ALSI)	-0.6593	0.1358	0.01180	0.9094	-0.00096	0.9930
3 (BLS) x 5 (ALSII)	-0.08649	0.8442	-0.1435	0.1682	-0.2165	0.0494*
4 (ALSI) x 5 (ALSII)	0.5729	0.2020	-0.1553	0.1451	-0.2155	0.0559

CVA – cerebral vascular accident. CHF - Congestive heart failure. SBV - basic life support. ALS - advanced life support.Δ- difference (before-after) in percentage. * - statistical significance p<0.05.

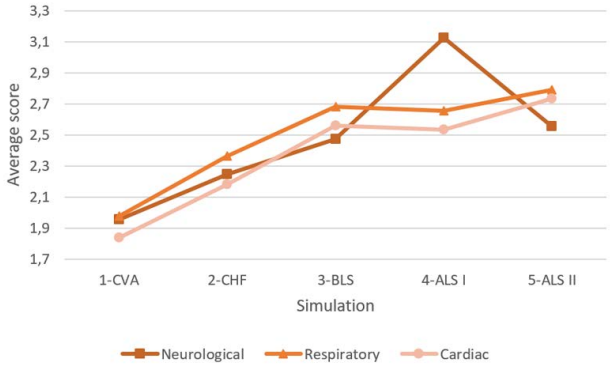

Figure 2 -Graphical representation of self-confidence among the five simulation scenarios in the neurological, respiratory, and cardiac areas

based learning. Authors agreed to state that SBT increase the self-confidence and satisfaction of the students, a fact that improves performance during academic training and prepares them for the real-life experience.[1,3,5,6]

Self-confidence is considered one of the factors that influence nurses' decision-making, especially in emergencies.[9]Afterthe completion of the Nursing degree, it is expected that future professionals have acquired knowledge and skills during their trainingthat enable coherent actions of quickly, systematically, and based on priorities, and SBTis a promising method for the development of these capabilities through the acquisition of self-confidence.[9]

Table 2 - Mean, minimum, maximum, and standard deviation scores for the satisfaction scale with simulated clinical experiences

Dimensions of the satisfaction scale	Scores		
	Mín*	Máx+	M±DP§
Practical Dimension	1.0	10.0	8.2±9.1
Realism dimension	6.0	10.0	8.5±1.1
Cognitive Dimension	4.0	10.0	8.5±1.3
General mean	3.6	10.0	8.4±3.8

*Minimum. + Maximum.±Mean. § Standard Deviation.

Self-confidence is related to the professionals' ability to believe in their abilities and in the self-success of their actions, factors that directly influence their safety to perform clinical care.[16] It is linked to self-efficacy and promotes professional autonomy, stability in decision making, and positive results with the assistance provided.[16]

The participation of Nursing students in clinical simulation scenarios favors the increase of specific self-confidence for their learning objectives, which may be related to the skills for cardiopulmonary evaluation,[17] to care in case of cardiopulmonary arrest with a focus on basic life support,[18] or advanced life support,[10,19] emergency interventions in cases of acute confusion, breathing difficulties and chest pain,[20] among others that include Nursing care in situations of low, medium and high complexity.[1,4,6,21]

In this sense, the simulated scenarios are important for the confidence of the future nurse, as it is not acquired momentarily, but over time, with support and preparation, and requiring persistence for its maintenance.[22]

This information is similar to the results of this research. Although there were variations in the change in self-confidence when comparing the five simulation scenarios, there was an increase in this variable. However, this increase may not have been progressive over the five scenarios since the objectives and clinical scenarios of each one were different. Thus, we believe that the student developed confidence according to the type of care proposed.

Self-confidence is also related to student satisfaction.[7] From the general score mean obtained by the scale of satisfaction with the simulated clinical experiences, we found that students showed high satisfaction, in which the cognitive dimension and that related to realism obtained the highest means and the lowest standard deviation values.

The mean in the cognitive dimension illustrates that, right after the simulation, most students reflected on their action, articulating theory with practice. Regarding the realism dimension, this means can show the scenario's ability to represent reality with legitimacy and fidelity. In the practical dimension, it influences the students' satisfaction with the simulations and the dynamism of the classes, which favors the student's teaching-learning process.

These dimensions also obtained the best means in a study developed in Portugal with the same scale to evaluate satisfaction after an emergency Nursing course. The authors attributed the lowest mean to the practical dimension due to the insufficient time dedicated to this component.[14]

Other studies thatevaluatedthe student´s satisfaction in different countries also showed positive results with the high-fidelity simulation.[5,23,24] A survey found that there was an increase in student satisfaction with the simulated experience, and they were more enthusiastic about activities with a significant and active involvement.[23]

In the United States, researchers conducted a quasi-experimental study with Nursing students at a beginner and advanced level. The results indicated more satisfaction and self-confidence in learning from high-fidelity simulation activities thananother low-fidelity training.[24]

These data corroborate this research since one of the highest averages obtained was for the realism dimension, which covers aspects related to the credibility and proximity of the scenarios developed with reality, and the quality of the material, equipment, and simulators used in the practices.

The satisfaction results obtained in this research can be promising for future research. Based on the means of each dimension, we can check and act on the items that require further improvement and planning, further improving satisfaction levels of students with simulated experiences and, consequently, teaching-learning.

Evidence shows that high-fidelity simulation has a positive impact on Nursing students' satisfaction with their learning. It can also influence the professional training process by relating to its performance, favoring the acquisition of self-confidence and self-efficacy and contributing to the construction of various skills in Nursing, especially in clinical conditions with the risk of death, in which students can improve their ability to assess and perform interventions in unstable patients, in a safe environment and without risks to the student and the patient.[5,23-25]

The aforementioned studies are consistent with the results of this research and demonstrate that the SBT is a method that can increase the satisfaction and self-confidence of the Nursing student, providing the training of nurses capable of making logical, safe, theoretically, and reasoned clinicaldecisions. Therefore, this research suggests that participation in the method can bring gains and benefits to real clinical experience.

CONCLUSION

The participants were satisfied with the simulated experiences and the clinical scenarios with progressive levels of complexity that allowed the increase of self-confidence for Nursing evaluation and intervention in emergencies, especially in the neurological, respiratory, and cardiac areas.

The NLN/Jeffries Simulation Theory model has the potential to assist teaching professionals in the development of scenarios sinceit facilitates and conducts the development of effective simulation scenarios and guarantees the conduct of the simulation in a technical, and professional way and with satisfactorylearning results.

The limitations of the research include the limited generalization of the results due to the only place of data collection and the fact that these students are linked to a curricular subject, which may have influenced their answers. Therefore, we suggest to replicate these scenarios in other public and private universities, and in different contextsto know, compare, and ratify these results.

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