

## ORIGINAL RESEARCH

# Theoretical and simulation classes in the emergency nursing curriculum in Cape Verde: Effect on the self-confidence to intervene in emergencies

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## Abstract

**Background/Objective:** Self-confidence is an attitude often associated with repeated experiences and with the realistic perception of individual weaknesses and strengths. It is not the same as competence but, with a view to a safe and timely intervention in the emergency context, it is necessary that nurses feel confident in their ability to intervene appropriately. In the context of simulation, the students' self-confidence is an important outcome that needs to be evaluated.

**Objective:** To evaluate the effect of theoretical and simulation classes on the nursing students' self-confidence.

**Methods:** Quasi-experimental study, without control group, with evaluation at three moments: before the classes, after the theoretical classes (40 hours) and after the simulation classes (25 hours). Questionnaires with the Portuguese version of the Self-confidence Scale were applied to 59 nursing students in two courses, in 2011 (25 students) and 2012 (34 students). All the students were taking the third year of the nursing undergraduate program. Formal and ethical principles were followed.

**Results:** The mean global self-confidence score corresponded to 2.35 on the first evaluation, increasing to 3.07 on the second and 3.34 on the third. The *t*-test reveals that these differences are highly significant ( $p < .001$ ). The individual analysis of each dimension (neurological, breathing and circulation) reveals similar and statistically highly significant improvements.

**Conclusions:** The classes were effective to improve the level of self-confidence. Simulated practice is a good strategy to improve the confidence to intervene in an emergency situation.

## Key words

Emergency nursing, Simulation, Education, Self-confidence

## 1 Introduction

Self-confidence is an attitude often associated with repeated experiences and with the realistic perception of individual weaknesses and strengths. It is not the same as being competent, but, for a safe and timely intervention in emergency

contexts, it is necessary that nurses feel confident that they are able to intervene appropriately <sup>[1]</sup>. Self-confidence results from the perception of the actual skills and weaknesses of each individual and it always concerns a specific behavior or task <sup>[2]</sup>.

Confidence is an important variable in training nurses. In an emergency situation, even when endowed with the appropriate knowledge and skills, nurses are reluctant to start some interventions, unless they are confident to do so <sup>[3]</sup>.

Students with increased self-confidence have a better chance at succeeding in their interventions because they are able to test and use their skills more easily, are more available to take on new challenges and recover more quickly from failure <sup>[2]</sup>.

When confronted with a patient in critical condition, one of the factors that may influence a quick and appropriate start of the intervention is exactly the professional's self-confidence to intervene. Given the characteristics of care organizations, the nurse plays a central role in this process. Therefore, when nurses complete their undergraduate training, they should be able to respond effectively to an emergency situation, identify a potentially critical situation and make the right decisions to prevent deterioration and revert the situation.

Effective and efficient resuscitation training is one of the essential elements in the translation of guidelines into clinical practice <sup>[4]</sup>. This training is crucial for high quality interventions in complex situations, such as cardiopulmonary arrests. It is important to remember that quality interventions are able to double or triple the patient's chance of survival <sup>[5]</sup>.

Simulation is a pedagogical strategy with high potential, with documented results at the level of undergraduate and graduate training <sup>[1, 6]</sup>. A modern curriculum includes simulation as a teaching/learning strategy and uses reflective observation and immersion experiences as instruments for the construction of knowledge <sup>[7]</sup>. And this is a safe way to learn for the different actors <sup>[1]</sup>.

Current scientific evidence shows that multiple results associated to simulation strategies in health professionals' training, especially when high-fidelity simulation is used. Examples of those results are more effective learning and appropriate usage of knowledge and skills <sup>[8, 9]</sup>, students' satisfaction <sup>[1, 10-12]</sup>, increased self-confidence to intervene in emergencies <sup>[1, 11, 13-16]</sup>, and the transferability of the skills learned to clinical practice <sup>[10, 17, 18]</sup>. Moreover, it is important to mention the advantages related to the development of more global skills, such as clinical judgment, priority setting, decision making, taking the right actions, teamwork and correcting errors without observing their effects on the patients <sup>[1]</sup>. Recommendations for training professionals in the resuscitation area include the use of realistic techniques, such as high-fidelity human patient simulators and realistic environments <sup>[4]</sup>.

Together with knowledge and skills, self-confidence is a central element in correct decision making within a clinical setting and the inherent judgment processes <sup>[19]</sup>. Some studies have shown that self-confidence for emergency response increases with repeated practice <sup>[2]</sup> and simulation training <sup>[1, 2]</sup>. According to Strzyzewski <sup>[20]</sup>, the most common errors nurses make during a patient resuscitation result from high levels of anxiety and low self-confidence. Students with higher levels of self-confidence have more chances to be well succeeded in the interventions, because they can more easily test and use their competences. Even with the appropriate knowledge and skills, nurses are often reluctant to initiate some interventions unless they feel confident to do so.

## 2 Methods

The University of Cape Verde is a young institution. The Degree in Nursing was established in 2008 through a partnership adopted between the University and the Nursing School of Coimbra, Portugal. The Emergency Nursing professors felt the need to evaluate the implemented pedagogical strategies.

A quasi-experimental study without a control group was conducted <sup>[21]</sup>, with the evaluation divided into three moments: before classes, after theoretical classes (40 hours) and after simulation classes (25 hours).

In the theoretical classes (40 hours), expositions and discussions were applied as teaching methods. Different themes were addressed with regard to airway-related emergencies, respiratory emergencies, cardiovascular emergencies and neurological emergencies. The classes followed the 2010 recommendations of the European Resuscitation Council.

In the practical classes (25 hours), the University simulation laboratories were used. The first classes were dedicated to the training of specific techniques (basic and advanced airways, use of AED, basic life support and trauma techniques) for adults and pediatrics. Subsequently, the scenario resolution method (adults and pediatrics) was used, with a progressive increase in difficulty. With regard to the scenarios, low-fidelity human patient simulators (Simulaid® Helal and Nasco® ALS Maniki manikins for adult scenario training and Laerdal® Baby Anne and ALS Baby manikin) were used. For each simulated practice, a group composed of four students developed a scenario while the remaining students watched. Following each scenario, a debriefing was conducted, aimed at reflecting on the practice and consolidating knowledge. The debriefings involved all students.

## 2.1 Participants

Questionnaires were applied to 59 nursing students of two different courses, in January 2011 (25 students) and November 2011 (34 students). All students were in the third year of the nursing program.

## 2.2 Instruments

The first part of the questionnaire contained demographic and pedagogical questions (applied only in the first evaluation), while the second part was the Portuguese version of the Self-confidence Scale (applied in the three evaluations) <sup>[22]</sup>.

The Portuguese version of the Self-confidence Scale <sup>[22]</sup> is a 12-item scale with Likert-style answers, asking the participant to indicate his/her confidence level. The answer may vary from “not at all confident” (1 point) to “very confident” (5 points). The different items identify the student’s abilities in the respiratory, cardiovascular and neurological areas: (1) to acknowledge signs and symptoms associated with changes in the mentioned areas, (2) to accurately evaluate the patient, (3) to intervene properly and (4) to evaluate the efficiency of the implemented interventions <sup>[2]</sup>.

In the adaptation and validation studies of the scale to the Portuguese population, high internal consistency rates were obtained for the complete scale (0.92) and for each individual dimension (> 0.83) <sup>[2]</sup>.

In this study, the Alpha coefficients were superior to 0.90 for the complete scale and superior to 0.84 for the three dimensions.

## 2.3 Formal and ethical procedures

The University granted authorization for the development of the study.

The study is part of the project “Simulation in Nursing Education”, registered at the Health Sciences Research Unit: Nursing of the Nursing School of Coimbra. The project received a positive assent from the Ethics Committee of that Research Unit (P01-09/2010).

The students were informed that the study was not related in any way with their course evaluation and that they could leave the research project at any time.

During the research process, the participants’ rights were respected, as well as the principles inherent to research involving human beings <sup>[23]</sup>. Written informed consent was used.

## 2.4 Data analysis

The data were analyzed by means of the SPSS software (version 19 for Windows). Statistical significance was set at  $p < .05$  for all tests.

### 3 Results

The students' average age was 22.38 years, with a standard deviation of 3.57 years. The youngest was 19 years old and the oldest 35. The median age was 21 years. The majority (86.4%) was female.

During the first two years of the degree, most students (55.9%) had the opportunity to observe, in a real context, professionals working in an emergency situation. Only 25.4% mentioned having actively participated in an emergency situation during the internship period.

Almost half of the students (45.8%) had spent one of the internship periods in an emergency service.

Before the start of the classes, the students' levels of self-confidence to intervene in an emergency situation were very low. The neurological dimension revealed the lowest scores and the respiratory dimension the highest. Table 1 shows the self-confidence scores on the first evaluation.

**Table 1.** Descriptive statistics concerning the level of self-confidence to intervene in an emergency situation before classes

Descriptive statistics	Neurological Dysfunction Dimension	Respiratory Dimension	Cardiovascular Dimension	Global Self-confidence
Mean	1.92	2.82	2.31	2.35
Median	2.00	3.00	2.25	2.38
Standard Deviation	.47	.61	.57	.46
Variance	.22	.37	.32	.21
Minimum	1.00	1.50	1.25	1.42
Maximum	3.00	4.50	3.75	3.50
Percentiles	25	1.50	2.25	2.00
	50	2.00	3.00	2.38
	75	2.25	3.00	2.67

After the theoretical classes, the students' self-confidence to intervene in an emergency situation increased in all dimensions and in the global result, as displayed in Table 2. The neurological dysfunction dimension still revealed the lowest score.

**Table 2.** Descriptive statistics concerning the level of self-confidence to intervene in an emergency situation after 40 hours of theoretical classes

Descriptive statistics	Neurological Dysfunction Dimension	Respiratory Dimension	Cardiovascular Dimension	Global Self-confidence
Mean	2.68	3.44	3.06	3.06
Median	2.75	3.50	3.00	3.00
Standard Deviation	.51	.59	.46	.45
Variance	.26	.35	.21	.20
Minimum	1.50	2.25	2.25	2.25
Maximum	3.75	5.00	4.50	4.00
Percentiles	25	2.25	3.00	2.67
	50	2.75	3.50	3.00
	75	3.00	3.75	3.33

After the practical simulation classes, the students' self-confidence to intervene in an emergency situation increased even more, in all dimensions and globally, as shown in Table 3. The neurological dysfunction dimension still revealed the lowest score, bordering on the midpoint. The respiratory dimension presented the highest scores, almost reaching four points.

A group of Student's *t*-tests for independent samples was conducted in an attempt to identify some confounding variables, showing that the fact that the students had observed the professionals in an emergency situation had not interfered in their levels of self-confidence. The same was true for the fact that they had actively participated in an emergency situation in one of the internships or the fact that they had done an internship in an emergency service.

**Table 3.** Descriptive statistics concerning the level of self-confidence to intervene in an emergency situation after 40 hours of theoretical classes plus 25 hours of simulated practice

	Neurological Dysfunction Dimension	Respiratory Dimension	Cardiovascular Dimension	Global Self-confidence
Mean	2.95	3.73	3.38	3.34
Median	3.00	3.75	3.25	3.33
Standard Deviation	.60	.57	.51	.49
Variance	.37	.33	.26	.24
Minimum	2.00	2.50	2.25	2.50
Maximum	5.00	5.00	4.75	4.58
Percentiles	25	2.50	3.25	3.00
	50	3.00	3.75	3.33
	75	3.25	4.00	3.75

The mean global Self-confidence score on the first evaluation was 2.35 points, increasing to 3.07 points on the second evaluation and to 3.34 points on the third evaluation. The Student's *t*-test revealed that these differences were highly significant ( $p < .001$ ). Similar values were obtained for each dimension (neurological, respiratory and cardiovascular) (see Table 4).

**Table 4.** Student's *t*-tests for paired samples regarding the different evaluations of self-confidence

Pairs	Mean	Standard Dev.	<i>t</i>	<i>p</i>
Neurological Dysfunction Dimension (evaluation 1)	1.92	.47	-9.72	.000
Neurological Dysfunction Dimension (evaluation 2)	2.65	.49		
Neurological Dysfunction Dimension (evaluation 1)	1.90	.47	-10.41	.000
Neurological Dysfunction Dimension (evaluation 3)	2.88	.52		
Neurological Dysfunction Dimension (evaluation 2)	2.67	.51	-3.39	.001
Neurological Dysfunction Dimension (evaluation 3)	2.95	.60		
Respiratory Dimension (evaluation 1)	2.82	.61	-8.83	.000
Respiratory Dimension (evaluation 2)	3.45	.58762		
Respiratory Dimension (evaluation 1)	2.82	.61	-11.13	.000
Respiratory Dimension (evaluation 3)	3.73	.58		
Respiratory Dimension (evaluation 2)	3.44	.59	-3.86	.000
Respiratory Dimension (evaluation 3)	3.73	.57		
Cardiovascular Dimension (evaluation 1)	2.31	.57	-9.50	.000
Cardiovascular Dimension (evaluation 2)	3.08	.45		
Cardiovascular Dimension (evaluation 1)	2.30	.56	-11.49	.000
Cardiovascular Dimension (evaluation 3)	3.40	.51		
Cardiovascular Dimension (evaluation 2)	3.06	.46	-4.84	.000
Cardiovascular Dimension (evaluation 3)	3.38	.51		
Global Self-confidence (evaluation 1)	2.35	.46	-10.49	.000
Global Self-confidence (evaluation 2)	3.07	.43		
Global Self-confidence (evaluation 1)	2.33	.46	-11.36	.000
Global Self-confidence (evaluation 3)	3.31	.45		
Global Self-confidence (evaluation 2)	3.06	.45	-4.34	.000
Global Self-confidence (evaluation 3)	3.34	.49		

## 4 Discussion

On all the evaluations, the best score was observed for the respiratory dimension and the worst for the neurological dimension.

The easier nursing evaluation and intervention in the respiratory area explained the better results in this area. On the contrary, the greater complexity to identify and interpret neurological signs and symptoms and the greater level of difficulty to intervene made the students less confident to evaluate and intervene appropriately in this dimension. The larger number of scenarios focused on respiratory problems and the beginning of the action by the airway and respiratory (A and B) evaluation showed how repeated experiences may have a positive effect on self-confidence. Other authors<sup>[1,2]</sup> have also studied this aspect.

In global terms, the students' self-confidence to intervene in an emergency situation reached 2.35 points on the first evaluation (below the midpoint of the scale), increased to 3.06 points after the theoretical classes and to 3.34 points after the simulated practice. Simultaneously, the minimum and maximum obtained increased progressively. The t-tests showed that the increase in the mean global and dimension scores was statistically highly significant. Both the theoretical and the simulation classes added knowledge and skills, improving the students' self-confidence to intervene. In the study conducted by Smith *et al.*<sup>[24]</sup>, the advantage of using several strategies was demonstrated to promote confidence in decision making processes concerning the triage of patients in the emergency department. In the study by Wolf and Mass<sup>[25]</sup>, simulation appeared as an effective strategy to increase the nurses' confidence in triaging patients in the emergency department. Other studies show the efficacy of simulation to improve the students' self-confidence in other areas of nursing care<sup>[12-14, 26, 27]</sup>.

Simulation has the potential to safely confront the students with the difficulties and encourage them to learn<sup>[27]</sup>. It is therefore an excellent strategy to develop skills<sup>[1, 2, 6, 28, 29]</sup> and improve the nurses' self-confidence to intervene in emergency situations<sup>[11, 13, 14, 16]</sup>.

## Limitations

The results are valid for the sample studied and ought to be generalized with caution. The context specificity of the research was a limitation. Another limitation is related to the type and size of the sample. The fact that the students who did not attend all classes were not excluded from the sample is another factor that should be considered. Future studies with larger samples and greater control over other variables should provide further insight into the validity of the conclusions.

## 5 Conclusions

The pedagogical strategies adopted are effective to enhance the students' level of self-confidence. Simulated practice is a good strategy to improve confidence to intervene in an emergency situation. At the end of the curricular unit, the students obtained good results on the theoretical and practical evaluation, which probably illustrates their improved self-confidence.

Given the results, the need for greater investment in the neurological dimension is perceived. In addition, further research is necessary, with bigger samples and greater control over other variables. The sample and context specificity were limitations in this study.

## Implications for practice

These results can be applied at two different levels. For nurses who train nursing students, they prove the importance of combining different pedagogical strategies to optimize learning results. For nurses who manage the emergency

departments, the results help to put their nurses' continuous training in perspective, focused on simulation, and also to put the training programs in perspective, aiming for the integration of new nurses.

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