



## CLINICAL SIMULATION IN NURSING: EXPERIENCE REPORT ON THE CONSTRUCTION OF A SCENARIO

### SIMULAÇÃO CLÍNICA EM ENFERMAGEM: RELATO DE EXPERIÊNCIA SOBRE A CONSTRUÇÃO DE UM CENÁRIO

### SIMULACIÓN CLÍNICA EN ENFERMERÍA: RELATO DE EXPERIENCIA EN LA CONSTRUCCIÓN DE UN ESCENARIO

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#### ABSTRACT

**Objective:** to describe the experience of constructing a clinical simulation scenario in nursing. **Method:** a descriptive study, consisting of an experience report of graduate nurses on the construction of a clinical simulation scenario in nursing. The process of scenario construction started with the theoretical study on required steps and components for its construction. **Results:** a fictitious clinical case through which the scenes were developed, considering the skills expected from students during the simulation. The development and validation of the clinical simulation scenario was important to reduce uncertainties in its construction. **Conclusion:** clinical simulation allows for students and professionals to perform practice in different scenarios in a protected space. The construction and validation of the scenario contributes to a greater chance of simulation to achieve its objectives more efficiently. **Descriptors:** Simulation; Education, Nursing; Oncology.

#### RESUMO

**Objetivo:** descrever a experiência da construção de um cenário para simulação clínica em enfermagem. **Método:** estudo descritivo, tipo relato de experiência de enfermeiras pós-graduandas sobre a construção de um cenário para simulação clínica em enfermagem. O processo de construção do cenário se iniciou a partir do estudo teórico sobre as etapas e os componentes necessários para sua elaboração. **Resultados:** construiu-se um caso clínico fictício e por meio dele foram desenvolvidas as cenas, a partir das habilidades esperadas do aluno durante a simulação. A elaboração e a validação do cenário clínico para a simulação foi importante para reduzir incertezas na sua construção. **Conclusão:** a simulação clínica possibilita aos estudantes e profissionais executar a prática em diferentes cenários através de espaços protegidos. A construção e validação do cenário contribuem para que a simulação tenha maior chance de atingir seus objetivos de forma mais eficiente. **Descritores:** Simulação; Educação em Enfermagem; Oncologia.

#### RESUMEN

**Objetivo:** describir la experiencia de la construcción de un escenario para simulación clínica en enfermería. **Método:** estudio descriptivo que relata la experiencia de enfermeras de cursos de post-graduación en la construcción de un escenario de simulación clínica en enfermería. El proceso de construcción del escenario se inició a partir del estudio teórico de los pasos y componentes necesarios para su producción. **Resultados:** se construyó un caso clínico ficticio a través del cual se desarrollarán las escenas a partir de las competencias que se esperan de los estudiantes durante la simulación. El desarrollo y la validación del escenario para simulación clínica fueron importantes para reducir la incertidumbre en su construcción. **Conclusión:** la simulación clínica permite a los estudiantes y profesionales ejecutar la práctica en diferentes escenarios mediante áreas protegidas. La construcción y validación del escenario contribuyen para que la simulación tenga una mayor posibilidad de alcanzar sus objetivos de manera más eficiente. **Descriptores:** Simulación; Educación en enfermería; Oncología.

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INTRODUCTION

In nursing, teaching skills through simulation is historical, by using mannequins or other media and high fidelity devices, especially beginning in 1950.<sup>1</sup> Simulation through an artificial environment recreates a real situation to practice, learn, validate, test or develop understanding of human systems or actions, with a high degree of interactivity and realism for participants.<sup>2</sup>

The use of simulation in teaching is an important tool to assist students in developing the necessary skills. It is known that performance in health care settings requires extensive professional skill development, because in addition to knowledge related to the specific subject, there is also the need to develop teamwork, have an appropriate deportment, and be proactive.<sup>3</sup>

Over the past ten years, technological advances related to the development of mannequins<sup>4</sup>, as well as computer software<sup>5</sup>, allowed for the improvement of simulation-based medicine. Therefore, by using simulation, it is possible to facilitate learning of health professionals and to reduce complications in patients caused by inadequate interventions or treatments.<sup>6</sup>

Simulation in teaching of clinical skills, with a focus on psychomotor, cognitive, interpersonal, and ethical/legal skills, is preceded by some stages, the first of which requires the development of a scenario.<sup>7</sup> The description of this scenario should be performed in accord with an objective and should facilitate the achievement of positive outcomes in the learning process.<sup>8</sup>

The importance of the scenario is then highlighted in clinical simulation. It should be planned and constructed in order to provide the necessary structure for the acquisition of stipulated learning objectives;<sup>9</sup> it should provide participants with insight as close as possible to the feelings and emotions they may experience in the clinical setting.

The model proposed by Jeffries can be used<sup>9,10</sup> for the construction of a simulation, which recommends steps of planning, implementation and evaluation of the simulation activities. The author includes five components in the planning of simulation: the facilitator, the participants, the educational practice, the design of the simulation characteristics, and the findings. This model also has subcomponents for each component mentioned above; here we highlight those related to the design of the simulation characteristics, including: objectives, fidelity,

problem-solving, student and participant support, suggestions, thoughts and reflections during debriefing.<sup>9,10</sup>

For the construction of the scenario described in this report, the authors used Jeffries' model<sup>9,10</sup>, more specifically the component design of the simulation characteristics and its subcomponents, which guides the construction of scenarios.

It is understood in this study that care is related to the process of collecting patient information through assessment and physical examination in order to identify nursing diagnoses, establish expected outcomes and propose interventions for their resolution.

OBJECTIVE

- To describe the experience of constructing a scenario for the care of cancer patients with a totally implanted central venous catheter (TICVC).

METHOD

A descriptive study, consisting of an experience report of graduating nurses, on the construction of a nursing clinical simulation scenario, in order to promote nursing care for cancer patients with a TICVC.

The scenario was developed during participation in a graduate course about Clinical Simulation in Nursing at the School of Nursing of Ribeirão Preto, University of São Paulo (EERP-USP), in 2014.

Four nurses with experience in teaching and caring for cancer or critical patients participated in the construction and revision of the scenario to be administered to students in the last semester of an undergraduate nursing course.

This process of scenario construction started with a theoretical study on the required steps and components for the construction of a clinical simulation scenario, and also about the care of cancer patients with a TICVC experiencing pain.

According to the model proposed by Jeffries (2005)<sup>9</sup>, and Jeffries and Rogers (2012)<sup>10</sup>, in the study presented here the specific component simulation design was used, including the elements: definition of the simulation objectives, fidelity, problem-solving, student support, and debriefing.

♦ Simulation objectives

The simulation objective was that nurses could perform nursing care for cancer patients with a TICVC. This activity should include: collecting information (assessment and physical examination), establishing the

priority nursing diagnoses, expected outcomes, and the proposal of interventions for their resolution.

◆ Fidelity

For the selection of the mannequin, when considering fidelity, it was necessary to construct a previous case, namely, to determine the signs and symptoms that would be presented by the subject (mannequin) during the activity, including physiological responses to each intervention performed by the participants.

The clinical case developed was: "Mrs Julia R., 48 years old, has left breast adenocarcinoma, underwent a mastectomy, followed by intravenous chemotherapy through a TICVC in the right hemithorax. The treatment was completed a month ago and she attended the chemotherapy clinic for the first TICVC maintenance. She has fear and insecurity regarding her health. She refers to chest pain and feeling of palpitations."

It is worth pointing out that some of the symptoms presented by the patient can be considered as confounding factors, because they can lead to other interpretations. In this scenario, for example, chest pain and feeling of palpitations can lead the evaluator to

suspect different clinical causes in addition to anxiety. Here the importance of nursing assessment based on scientific knowledge and clinical reasoning is highlighted.

A medium-fidelity mannequin was used, specific for training on the technical skills for TICVC. It represented a woman, allowed for monitoring of vital signs, and had a TICVC in the right hemithorax. The situation had an outpatient chemotherapy clinic as its setting.

The material and human resources were then determined, in addition to the equipment needed for the simulation. In order to develop this, two participants, called team members, were required: one nursing technician and a nurse.

It was established that the scenario would have an estimated duration of 15 to 20 minutes, and would be classified as medium-complexity.

◆ Problem-solving

After being presented with the clinical scenario, the participants were requested to provide care for the patient. For this case, the scenes were developed and the competencies and skills expected from the students during simulation were developed, as shown in Table 1.

Scene	Events	Expected actions
Scene 1		
Data collection and identification of priority diagnosis	Patient's clinical parameters: BP=160x100 mmHg, HR=110 bpm, sweating, cold skin. Diffuse chest pain.	Identify relevant clinical data. Investigate pain (PQRST*). Differentiate chest pain among various situations: AMI, TICVC rollover, TICVC-related infection, anxiety. Request and evaluate chest X-ray, EKG and cardiac enzymes. Identify the cause of pain, by excluding other diagnostic possibilities. Confirm the priority nursing diagnosis, Anxiety.
Scene 2		
To establish outcomes and propose interventions	Patient's clinical parameters: BP=160x100 mmHg, HR=110 bpm, sweating, cold skin. Diffuse chest pain. Unaltered EKG, X-ray and cardiac enzymes.	Establish outcome: Anxiety management. Request medical assessment for pharmaceutical pain management. Perform nursing interventions to control anxiety: relaxation, therapeutic listening, instructing.
Scene 3		
Evaluate clinical status	Patient's clinical parameters: BP = 140x90mmHG, HR=90 bpm, decreased sweating. Decreased intensity of diffuse chest pain	Evaluate pain and clinical status

Figure 1. Description of the scenes, events and expected actions in the simulation of care for cancer patients with a totally implanted central venous catheter.  
\*P- What provoked pain; Q- Quality; R- Radiation; S- Severity (intensity from 0 to 10); T - How long (Time).<sup>11</sup>

◆ Student support

Because it is a specific nursing care situation, it was established that prior to participation in the simulation, participants should watch a video about care in maintaining TICVC, which was available in the collection of EERP/USP.<sup>12</sup>

During the process, one nurse facilitator participated in the scenario, playing the role of evaluator, and helping students understand the clinical situation.

In addition to giving the learner the best indication of the problem, one of the nurses who participated in the scenario construction served as "the patient's voice". A script was

designed to ensure the quality of information during scenario development.

In order to give an example, we present the "topics" of the dialogue between two of the authors representing the roles of a nurse and the patient (Table 2). The scenario

development before its presentation to the students was considered a test of the proposal, in order to adjust what was required for material and human resources, time duration, among others.

Character	Script
Nurse	Mentions her name and asks how the patient is feeling.
Júlia R.	Reports chest pain.
Nurse	Investigates pain through PQRST.
Júlia R.	Describes the pain characteristics according to the nurse's assessment. Demonstrates nervousness.
Nurse	Continues pain assessment and tries to calm her down.
Júlia R.	Reports fear of death. Reports fear that the disease has returned. Describes the pain characteristics according to the nurse's assessment.
Nurse	Continues pain assessment and tries to calm her down.
Júlia R.	Reports fear of death. Reports fear that the disease has returned. Reports fear regarding catheter maintenance. Describes the pain characteristics according to the nurse's assessment.
Nurse	Continues assessment.
Júlia R.	Describes the pain characteristics according to the nurse's assessment.
Nurse	Performs interventions for pain management (medication, integrative practices). Evaluates.
Júlia R.	Reports symptom improvement.
Finished scenario	

**Figure 2.** Description of the words used in the care simulation for the oncology patient with a totally implanted central venous catheter.

◆ **Debriefing**

After the simulation, debriefing with the participants is recommended.<sup>9</sup> In this step, which is performed outside the simulation environment, issues are reviewed related to: self-assessment regarding care performed, feelings about the situation, the use of the knowledge acquired during the simulation in professional practice, a reflection of one's strengths, and theorizing about what participants would do differently.

**DISCUSSION**

With the advent of new technologies, new generations of students in computer-mediated learning, accurate clinical reasoning, quick decisions, in combination with all the senses have been increasingly in demand. In addition to these elements, due to the increasing number of health care programs, and their impact on the cost of learning, it is necessary to use simulation in the current learning environment.

The simulated clinical experience must take place in a realistic environment, led by submitting a case to the participants, who must take responsibility for the patient, as in a clinical setting. By analyzing the case and interacting with the simulator, it is expected that the student will perform some interventions, which in turn should produce responses from the simulator.<sup>13</sup>

During simulation, the professor or other designated persons can help students by providing information about the care.<sup>9</sup> For a

simulation activity to be successful, in addition to having the material and equipment, it is essential that the scenario is well designed, with defined objectives, and that the team in charge is prepared.<sup>13</sup>

Objectives are an essential part of the simulation construction project, and should be shared with the participants.<sup>14</sup> For the scenario building activity described in this paper, we used a medium-fidelity mannequin. This choice was based on the objectives of the activity and the description of the facts in the script, the scenes, unexpected events and actions. Selecting this type of mannequin was adequate to achieve the objectives proposed in this simulation.

The word fidelity is used in simulation to describe the accuracy of the system being used.<sup>15</sup> In clinical simulation activities, low-, medium- or high-fidelity mannequins can be used, depending on the activity and objectives.<sup>13</sup>

Medium-fidelity mannequins offer, in addition to similarity of the anatomical aspects, the ability to assess lung and heart sounds, and for monitoring. They are widely used for the development of skills, from the beginning of learning to providing a deeper understanding of a given theme,<sup>15</sup> and also for composing more simple scenarios.<sup>13</sup>

It should be noted that high-fidelity mannequins provide more realistic experiences, from the appearance to the responses to interventions. By providing a high degree of realism, they are widely used as



teaching tools.<sup>15</sup> In contrast, low-fidelity simulators, despite having external anatomy very similar to a human, do not provide responses to interventions. For this reason they are indicated for the teaching of technical skills and specific competencies.<sup>13</sup>

In this activity we chose to use a video about care for maintaining TICVC<sup>12</sup> prior to the simulation, in order to ensure information on the purpose of the procedure, its insertion, and to review the steps of the procedures for its management. It is vital to the success of clinical simulation that participants have previously performed and developed technical skills. Thus, the focus of their attention will not be limited to executing the task, but will focus on a broader approach, involving the patient's global assessment, the development of clinical reasoning, teamwork, among others.<sup>13</sup>

For the professor to guide the participants' journey, and thus ensure that all the expected skills are developed, reaching the ultimate objective of the scene, it is necessary to describe the scenes of the script. Similarly, the use of a standard language for describing the information can help researchers develop scenarios and psychometric instruments to replicate studies.<sup>14</sup> In this script no regional terms or abbreviations were used.

It was previously determined that the activity should take between 15 and 20 minutes. According to Jeffries (2005)<sup>9</sup>, clinical simulations must mimic clinical practice, and should be authentic and include as many environmental factors as is realistically possible, so as to promote a better learning result. Therefore, the time recommended to perform the scenario should equate to that of a real-time situation. The predicted time proved sufficient for the performance of the activities.

Simulation scenarios offer cognitive, psychomotor and affective experiences, contributing to the transfer of knowledge from the classroom to clinical environments;<sup>16</sup> therefore, the duration of the scenario should corroborate with the idea of reality, because after this experience, professors should strengthen modifications to procedures, correct mistakes, and explain the points where there is need for student improvement.<sup>17</sup>

The final step of the clinical simulation experience is a discussion about the situation experienced, debriefing.<sup>9,13</sup> During this phase, participants can ask questions about the verbal and nonverbal communication and empathy of students during the performance of the scenario. Simulation cannot replace

clinical experience, however, it can offer opportunities for students to learn in realistic scenarios.

It is recommended that debriefing is performed immediately after the simulation, so that the thoughts and feelings experienced during the activity are not forgotten or become distorted due to the passage of time. This step should include teachers and students who participated in the process.<sup>14</sup> In this study, the question about the use of a different environment than the one in which simulation occurred was considered positive by the authors.

## FINAL CONSIDERATIONS

The establishment of a safe practice model based on patient safety, in which using clinical judgment and critical thinking is necessary in order to be successful in both diagnostic and therapeutic clinical reasoning, has been associated with the use of realistic simulation required for professional training, as one learns to act safely in times of stress.

Therefore, it is essential to develop clinical scenarios with clear objectives that allow for students and nursing professionals for the highest approximation of clinical reality, to improve their satisfaction when participating in the practical experience, and also allow for continuous evaluation of the entire process.

The design and development of the scenario take time, and require new skills which can be characterized as a difficult aspect of simulation, given that many professors do not have the required time to perform all of these steps. The use of previously developed and validated scenarios leads to success in the use of simulation as a teaching strategy. Thus, providing validated scenarios and training more professionals to work with this teaching strategy will help ensure quality simulation.

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Garbuio DC, Oliveira ARS, Kameo SY et al.

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