

# Realistic simulation scenario on non-punitive responses to errors in the Surgical Center



*Cenário de simulação realística sobre respostas não punitivas aos erros no Centro Cirúrgico*

*Escenario de simulación realista sobre respuestas no punitivas a los errores en el centro quirúrgico*

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## ABSTRACT

**Objectives:** Develop a realistic simulation scenario on non-punitive responses to errors for application with Surgical Center leaders.

**Method:** Applied methodological study with three phases: I) construction of the simulation scenario using the National League for Nurses Jeffries Simulation Framework methodology; II) validation of scenario content by experts and assessment of leadership satisfaction and self-confidence; and III) application of the simulation scenario for leaders and assessment of satisfaction and self-confidence with learning using the *Student Satisfaction and Self-Confidence in Learning scale*.

**Results:** The scenario developed, titled "Leadership skills for non-punitive responses to errors in the Surgical Center" was validated by six experts and achieved a 100% content validity index. Practical application of the scenario identified appropriate knowledge on the topic. Satisfaction with learning and self-confidence scored 100% and 96.1%, respectively.

**Conclusion:** The research highlighted the potential for developing a simulation scenario, supporting the satisfaction and self-confidence in skills that underlie a safety culture through experimental learning.

**Descriptors:** Patient safety; Organizational culture; Simulation training; Health education; Surgical Center.

## RESUMO

**Objetivos:** Desenvolver um cenário de simulação realística sobre respostas não punitivas aos erros para aplicação com lideranças de Centro Cirúrgico.

**Método:** Estudo metodológico aplicado, dividido em três fases: I) construção do cenário de simulação, utilizando a metodologia do *National League for Nurses Jeffries Simulation Framework*; II) validação de conteúdo do cenário por experts e avaliação da satisfação e autoconfiança das lideranças; e III) aplicação do cenário de simulação para lideranças e avaliação da satisfação e autoconfiança com a aprendizagem por meio da escala *Student Satisfaction and Self-Confidence in Learning*.

**Resultados:** O cenário desenvolvido, denominado "habilidades das lideranças para respostas não punitivas aos erros no Centro Cirúrgico", foi validado por seis especialistas e obteve resultado de 100% no índice de validade de conteúdo. A aplicação prática do cenário identificou conhecimento apropriado das lideranças sobre o tema. A satisfação com a aprendizagem e a autoconfiança obtiveram escores de 100% e 96,1%, respectivamente.

**Conclusão:** A pesquisa evidenciou o potencial de desenvolvimento de um cenário de simulação, corroborando para a satisfação e a autoconfiança de habilidades que fundamentam uma cultura de segurança através da aprendizagem experimental.

**Descritores:** Segurança do paciente; Cultura organizacional; Treinamento por simulação; Educação em saúde; Centro cirúrgico.

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## RESUMEN

**Objetivos:** Desarrollar un escenario de simulación realista sobre respuestas no punitivas a errores para su aplicación con líderes de Centros Quirúrgicos.

**Método:** Estudio metodológico aplicado con tres fases: I) construcción del escenario de simulación utilizando la metodología National League for Nurses Jeffries Simulation Framework; II) validación del contenido del escenario por parte de expertos y evaluación de la satisfacción y confianza en sí mismos de los líderes; y III) aplicación del escenario de simulación para líderes y evaluación de la satisfacción y autoconfianza con el aprendizaje mediante la escala de Satisfacción y Autoconfianza en el Aprendizaje del Estudiante.

**Resultados:** El escenario desarrollado, denominado "Habilidades de liderazgo para respuestas no punitivas a errores en el Centro Quirúrgico", fue validado por seis expertos y obtuvo un resultado del 100% en el índice de validez de contenido. La aplicación práctica del escenario identificó el conocimiento adecuado de los líderes sobre el tema. La satisfacción con el aprendizaje y la confianza en sí mismos obtuvieron puntuaciones de 100% y 96,1%, respectivamente.

**Conclusión:** La investigación destacó el potencial para desarrollar un escenario de simulación, apoyando la satisfacción y la confianza en uno mismo de las habilidades que subyacen a una cultura de seguridad a través del aprendizaje experimental.

**Descriptores:** Seguridad del paciente; Cultura organizacional; Entrenamiento simulado; Educación en salud; Centro Quirúrgico.

## ■ INTRODUCTION

To ensure quality of care and patient safety, it is necessary to develop a safety culture in healthcare institutions. Safety culture can be understood as a grouping of individual and collective values, attitudes, perceptions, skills and habits of the members of an organization. This culture determines the development of management and operational practices of a safe organization<sup>(1,2)</sup>.

The consolidation of a safety culture is essential for the prevention of adverse events, which are characterized as unintentional harm resulting from health care; they result in increased length of hospital stay, temporary or permanent disability and, in some cases, death. In the context of surgical patient care, these events occur frequently, which leads to increased mortality, length of hospital stay and negative impacts on patients<sup>(3)</sup>.

The education of the multidisciplinary team is essential to develop a safety culture and ensure quality care; however, one of the challenges in building a positive safety culture in the health area is the different ways in which it is perceived by different levels – whether leaders or bedside health professionals – of the same organization<sup>(4)</sup>. Aiming to improve the quality of health care and promote the development of knowledge, skills and attitudes in a controlled environment, simulation-based education (SBE) is a widely disseminated strategy to strengthen the quality of health care<sup>(5-7)</sup>. From this perspective, educational practices aimed at leaders have been recognized as effective methods of changing reality and advancing the maturation of the safety culture in health institutions<sup>(8,9)</sup>. A quasi-experimental study<sup>(9)</sup> conducted in China evaluated the impact of a patient safety leadership program on head nurses,

showing that the training program for head nurses not only benefited the leaders, but also the clinical nurses, resulting in improved quality of treatment outcomes and patient safety.

Realistic simulation can be implemented in critical environments, such as the Surgical Center (SC), which presents high complexity and faces professional pressure, proving to be effective for learning clinical practice and management. It allows the establishment of a controlled environment for the development of skills and knowledge, corroborating safe care practices in institutions<sup>(10)</sup>. In the context of leadership, simulation is used to strengthen and develop leadership skills in health services, such as conflict management and decision-making, which makes it an important teaching tool for professional practice<sup>(11)</sup>.

The relevance of this methodology is highlighted, as it has the potential to improve communication between the healthcare team, the practical skills of professionals and leadership processes, which are crucial for care to be provided effectively<sup>(12)</sup>. This study is therefore justified by constructing, validating and evaluating a scenario in which leaders play an impactful role on the safety culture in institutions.

Because it is a complex and critical space, the surgical center is a setting for frequent multidisciplinary conflicts that are difficult for leaders to address<sup>(13)</sup>. This difficulty may be influenced by the nurses' training, which is both generalist and technical, and many courses in Brazil do not offer the surgical center discipline<sup>(14,15)</sup>. Thus, the following research question was established: can a realistic simulation scenario be applied to enable surgical center leaders to develop skills that underpin a positive safety culture?

This study aimed to develop a realistic simulation scenario on non-punitive responses to errors for application with Surgical Center leaders. The practical application of the scenario identified appropriate knowledge of the leaders on the subject. Satisfaction with learning and self-confidence obtained scores of 100% and 96.1%, respectively.

## ■ METHOD

Applied methodological study characterized by addressing the development, validation and evaluation of research tools or methods<sup>(16)</sup>. The present study followed three stages: construction of a realistic simulation scenario; validation of the scenario by experts; and carrying out the simulation for leaders, with subsequent assessment of satisfaction and self-confidence in learning (Figure 1). The research was carried out in a general hospital located in the southern region of Brazil, in 2021.

Intentional sample, composed of two groups of participants: six experts in simulation or safety culture and three leaders who work at the hospital where the research was carried out.

Nine experts were invited to validate the scenario. They were selected based on their expertise in the topics studied: patient safety, safety culture, and realistic simulation. Of the nine experts invited, six (five nurses and one pharmacist) agreed to participate in the study. The number of experts who accepted participate in the study met the literature recommendation, which indicates five to six<sup>(17)</sup>. The inclusion criterion for experts was having proven experience of five or more years in simulation and/or safety culture; the exclusion criterion was having a connection with the institution examined.

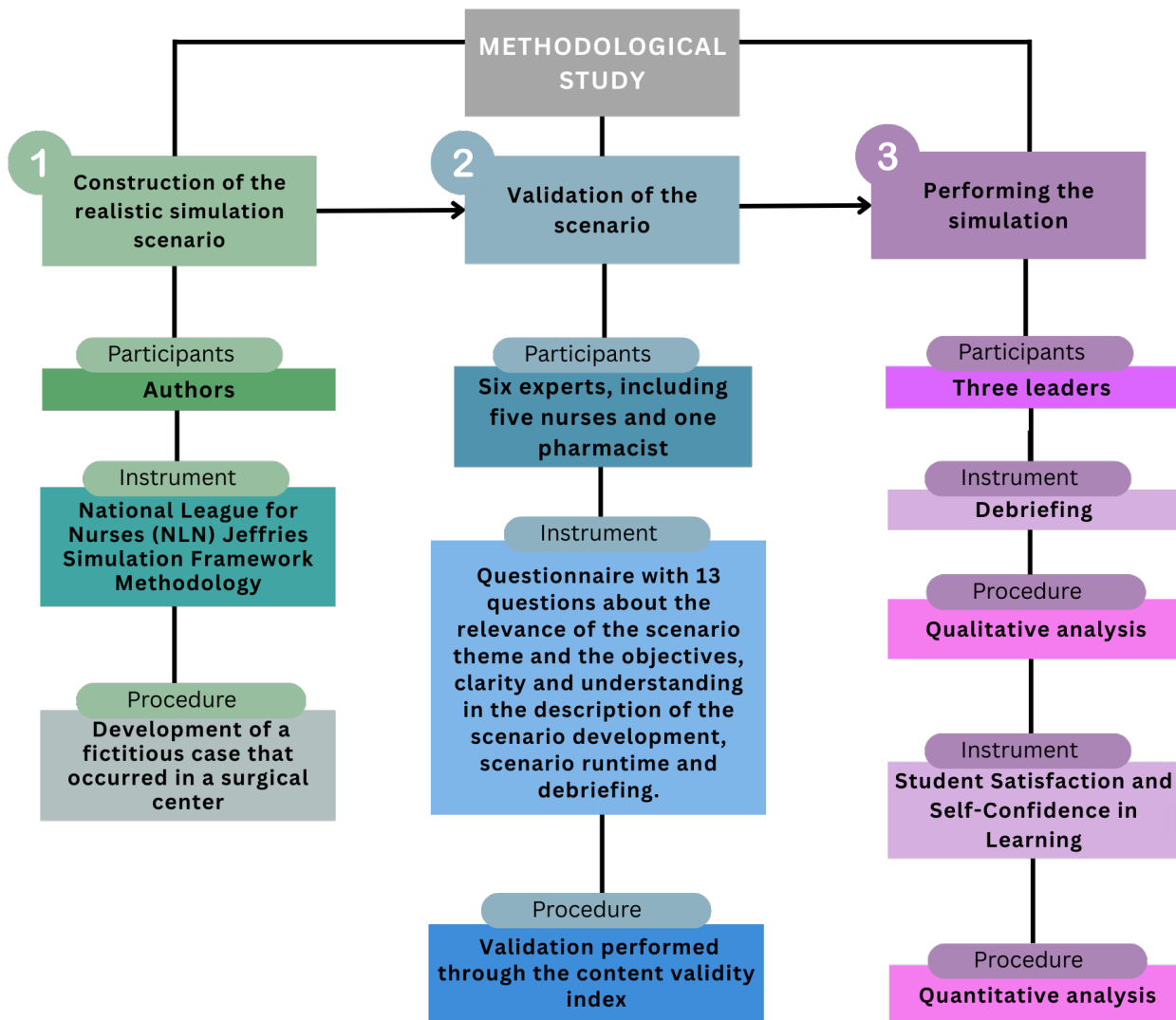
Three leaders who work at the institution where the research was conducted and who have a working relationship with the researchers, but with the same hierarchical level, participated in the simulation. The number of participants was small because of the pandemic. In 2021, when the research was carried out, Rio Grande do Sul and part of Brazil went through the worst moments of the COVID-19 pandemic, placing excessive demands on all health professionals, including leaders. The inclusion criteria for leaders were having

professional experience in a management position for more than one year and acting as a leader in surgical areas. Absence or vacation during the study period was considered an exclusion criterion.

The first stage of the research was the construction of the realistic simulation scenario. The choice of the theme for the development of the scenario emerged from the results of a validated survey in Brazil, using the Hospital Survey on Patient Safety Culture (HSOPSC) questionnaire, which addresses safety culture and which had already been administered in the institution. This study aimed to assess the status of the patient safety culture in the institution – identifying strengths and areas for improvement in the safety culture – and trends in changes in safety culture over time, as well as the impact of initiatives and interventions aimed at patient safety<sup>(18)</sup>. From this research, whose data are from institutional domains, some weakened dimensions emerged, with scores below 50%<sup>(18)</sup>, one of which was “Non-Punitive Responses to Errors”; this was the one selected for the elaboration of the simulation scenario. This theme was chosen because it is the dimension with the lowest score in the latest national survey published by ANVISA<sup>(24)</sup>.

The role-play design, based on the National League for Nurses (NLN) Jeffries Simulation Framework<sup>(19)</sup> methodology, was selected because it is the method supported by the National League for Nurses and the Laerdal Corporation<sup>(19)</sup>. This methodology allows the identification of student expectations and the general objectives of the simulation, in addition to the resources required for it to occur. The simulation design includes specific learning objectives, desired fidelity, job assignments of the student, simulation flow and strategies for pre-briefing and debriefing. This structure promotes an environment of trust on the part of the facilitator and students, defining an interactive, student-centered, experiential and collaborative simulation experience. Considering the requirements of the proposed methodology and design, the authors developed a fictitious case that occurred within a Surgical Center, contemplating the safety goal of identifying the correct patient, within the theme of “non-punitive responses to errors”, aiming to evaluate the behavioral aspects related to the process.

**Figure 1.** Stages of the methodological study. Porto Alegre, RS, Brazil, 2024.



Source: prepared by the authors (2024).

In the second stage, the simulation scenario was validated by experts. At first, invitations to participate were sent; after acceptance, the research summary, the Free and Informed Consent Form (FICF) and the questionnaire with thirteen questions prepared based on the scenario phases were sent via Google Forms<sup>(19)</sup>. The questions were related to the suitability of the target audience versus the theme, relevance of the objectives, pedagogical framework made available, time allocated to the scenario phases, understanding of the case, critical points of the scenario, understanding of the steps to be followed by the actor and participants and debriefing.

The collected data were accessed by exporting the spreadsheet to Google Forms<sup>®</sup> and validation was performed using the Content Validity Index (CVI)<sup>(19)</sup>, using a four-point Likert scale, where "4" was "I totally agree" and "1" was "I totally disagree". Data analysis by the researchers was performed using descriptive statistics and the CVI score was calculated by adding the agreement of the items selected in categories three and four (3 = I partially agree) to the total number of responses;  $CVI = \frac{\text{sum of responses 3 and 4 of the questionnaire}}{\text{total number of responses}} \times 100$ . According to the methodology, a minimum agreement of 85% must be achieved for validation<sup>(20)</sup>.

In the last stage, the simulation experience was conducted with the application of the scenario with the leaders and subsequent evaluation of the satisfaction and self-confidence of the learning. Beforehand, the participants received the FICF and teaching materials on safety culture for theoretical basis. The scenario developed in the form of dramatization was applied individually with each leader. The simulation was attended by an actor with professional training, who has been working in the healthcare area for more than 10 years and who is also an employee of the institution; the process was performed according to the protocol described in the proposed methodology<sup>(19)</sup>. The researchers observed the scene with the use of audiovisual resources. At the end of each simulation, the researchers, participants and the actor met to carry out the debriefing of the case. Also as part of the simulation, after the debriefing with each participant was completed, the Student Satisfaction and Self-Confidence in Learning scale<sup>(21)</sup>, a version adapted and validated in Brazil<sup>(21)</sup>, was applied to assess satisfaction and confidence. The scale has two dimensions: satisfaction with current learning and self-confidence in learning. Qualitative analysis was performed, based on the content used for the debriefing, through the analysis and grouping of the main aspects addressed; and also a quantitative analysis, for the self-confidence and satisfaction with learning scale, based on descriptive statistical analysis, according to the sum of all participants who responded “I agree” or “I totally agree” over the total number of responses.

The study was approved by the Research Ethics Committees, under Protocol No. 5,237,666 and Protocol No. 5,040,669, CAAE No. 51325721.9.0000.5345 and CAAE 51325721.9.3001.5328, and informed consent was obtained.

## ■ RESULTS

In the first stage of the research, a realistic simulation scenario was constructed using the proposed methodology. The dimension chosen for the elaboration of the scenario was “non-punitive responses to errors”. The case was developed based on a fictitious case that occurred in a Surgical Center, which challenges leaders to understand and practice the organization’s safety culture. The scenario was called “Leadership skills

for non-punitive responses to errors in the Surgical Center” (Figure 2).

In the second stage of the research, considering the experts – five nurses and one pharmacist –, a heterogeneous sample favorable to the research was found, composed of a group with diverse experiences that encompass the public and private sectors and health regulatory agencies (Table 1). Considering thirteen questions and six expert evaluators, a total of 78 responses were obtained; all were classified on the Likert scale as “partially agree” and “totally agree”, thus achieving a result of 100% in the Content Validity Index (CVI). A few adjustments to bring clarity, suggested by the experts, were considered by the researchers for inclusion. The comments are arranged by category in Chart 1.

In the third stage of the simulation for leaders (N=3), the participants’ profile showed a median age of 43.3 years, with 100% female; regarding the level of education, one leader had a master’s degree, one postgraduate degree and one only an undergraduate degree. The length of professional experience ranged from thirteen to seventeen years, with an average of 15.33 years of experience and a standard deviation of 2.50. During the simulation, the researchers monitored the simulation in real time through the audiovisual resource room available in the research environment. In the debriefing, carried out individually with each participant, all participants had knowledge about the topic of safety culture and adequately managed the situations and demonstrated active listening and empathy. Another positive point was that no leader encouraged punishment as a solution to the problem and all addressed the promotion of patient safety, the encouragement of notifications and the search for transparency as a pillar of quality and safety.

As for opportunities for improvements in debriefing, it was pointed out that leaders can address mutual accountability for patient safety and safety culture, reflecting more on the role of each individual in the scene.

Regarding the results obtained in the evaluation of participants’ satisfaction and self-confidence with learning through the Student Satisfaction and Self-Confidence in Learning scale, the dimension of satisfaction with learning reached 100% in the five questions, with all participants fully agreeing with what was asked.

**Figure 2.** Leadership skills for non-punitive responses to errors in the Surgical Center. Porto Alegre, RS, Brazil, 2024.

| THEME: LEADERSHIP SKILLS FOR NON-PUNITIVE RESPONSES TO ERRORS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                       |                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------|
| SCENARIO: SURGICAL CENTER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | PARTICIPANTS: LEADERS |                                                   |
| <b>GENERAL OBJECTIVE:</b><br>Apply the Student Satisfaction and Self-Confidence in Learning scale aiming to assess leadership satisfaction with the proposed method.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                       |                                                   |
| <b>SPECIFIC OBJECTIVES:</b><br>1.Improve leaders' reaction to the occurrence of adverse events with the participation of their subordinates.<br>2.Modify thinking and judgmental behavior when faced with the participation of subordinates in adverse events.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                       |                                                   |
| <b>MATERIAL RESOURCES:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Room with table and two chairs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                       |                                                   |
| <b>NUMBER OF PARTICIPANTS:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>DURATION:</b>      | Briefing: 5 minutes<br>Scenario: 15 to 20 minutes |
| SIMULATION CASE:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                       |                                                   |
| <b>CASE DESCRIPTION:</b><br>Patient admitted to an inpatient unit, awaiting nephrectomy surgical procedure. On the day of the procedure, the patient enters the surgical center (SC), is admitted and undergoes anesthesia. When the surgeon arrives in the room, he realizes that the patient there is not the correct patient. Surgery is not performed on the wrong patient. However, the patient was subjected to unnecessary anesthesia.<br>This is a case of serious error where several processes were not observed. The surgical center employee responsible for admitting the patient is being held accountable by the surgeon. The surgeon is one of the most renowned doctors in the institution, with a large surgical output and looks for the nursing leader in the area demanding that the employee be punished as a condition for him to continue performing surgeries in the institution. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                       |                                                   |
| ACTOR:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                       |                                                   |
| <b>ACTOR'S BRIEFING:</b><br>You are a renowned surgeon, well known in these and in other institutions in the city and have a very high surgical output in this hospital. You witnessed a serious situation of patient mix-up and the wrong patient was subjected to anesthesia unnecessarily. Upon entering the room, you realized that the patient there was not the one supposed to be operated and the procedure did not occur. You go to the surgical center leader's room to demand that the nursing technician who admitted this patient and placed him in the room be punished. You believe that all responsibility for this act lies solely with him and you do not accept that this employee goes unpunished. This is a condition for you to continue working at the hospital.                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                       |                                                   |
| PARTICIPANT:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                       |                                                   |
| <b>SEQUENCE OF ACTIONS EXPECTED FOR THE PARTICIPANT:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Action 1</b> - The leader greets the surgeon<br><b>Action 2</b> - The leader actively listens to what the surgeon reports<br><b>Action 3</b> - The leader counter-argues the allegation using the safety culture discourse<br><b>Action 4</b> - The leader counter-argues the allegation again explaining to the surgeon how the analysis of adverse events is done, arguing that there is a high frequency of unsafe processes and that the causes are more related to poorly designed processes than to people<br><b>Action 5</b> - The leader continues to argue and brings to light the responsibility and participation of the entire team in surgical patient safety processes, such as safe surgery and safety culture policies. |                       |                                                   |
| PRE DEBRIEFING:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                       |                                                   |
| <b>GUIDELINES THAT SHOULD BE PROVIDED TO THE STUDENTS:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1.Describe the objectives of the simulation<br>2.Describe the simulation case<br>3.Describe the type of simulator: the surgeon will be an actor who will be firm in his demand with the leadership of the surgical center<br>4.Align expectations regarding the use of safety culture standards and policies and investigation of adverse events.                                                                                                                                                                                                                                                                                                                                                                                          |                       |                                                   |
| DEBRIEFING:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                       |                                                   |
| <b>DISCUSS THE CRITICAL POINTS OF THE SIMULATION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1.What we expected to happen actually happened (describe expected reactions and behaviors);<br>2.Strengthen the positive points in the participant's actions<br>3.Argumentation based on safety culture, adverse events investigation processes and mutual accountability for patient safety processes.                                                                                                                                                                                                                                                                                                                                                                                                                                    |                       |                                                   |
| <b>FEEDBACK TO THE PARTICIPATING ACTOR OR ACTORS:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.Give feedback to the actor about his performance, what was well conducted and staged and what could have been better or could not have happened.<br>2.Give feedback to the participant about his performance, how his argument went, what was expected and what could have been better or could not have happened.                                                                                                                                                                                                                                                                                                                                                                                                                       |                       |                                                   |

Source: prepared by the authors (2024).

**Table 1.** Profile of experts who performed the evaluation of the realistic simulation scenario script (N = 6). Porto Alegre, Rio Grande do Sul, Brazil, 2024.

| Level of education                      | N (%)     |
|-----------------------------------------|-----------|
| Doctors                                 | 2 (33.3%) |
| Masters                                 | 3 (50%)   |
| Postgraduate students                   | 1 (16.7%) |
| <b>Length of experience in the area</b> |           |
| 5 years                                 | 1 (16.7%) |
| 6 - 10 years                            | 4 (66.7%) |
| Over 10 years                           | 1 (16.7%) |
| <b>Current operating scenario</b>       |           |
| Public health institution               | 1 (16.7%) |
| Private healthcare institution          | 3 (50%)   |
| Health regulatory bodies                | 1 (16.7%) |
| Health operators                        | 1 (16.7%) |

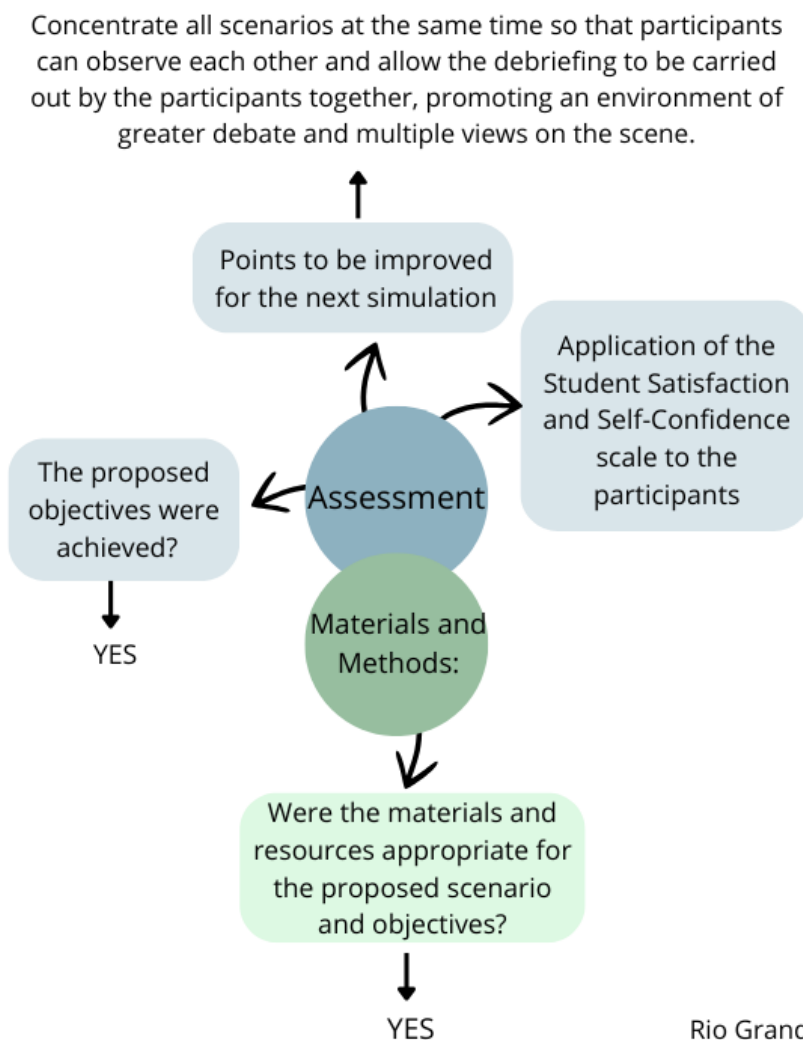
**Chart 1.** Expert suggestions for validating the realistic simulation scenario script (N = 6). Porto Alegre, Rio Grande do Sul, Brazil, 2024.

| Category   | Suggestion/comment                                                                                               | N (%)     |
|------------|------------------------------------------------------------------------------------------------------------------|-----------|
| Terms used | Replace the term "skill" with "competence"                                                                       | 1 (16.7%) |
| Objectives | Make the general objective broader and the specific ones bring the improvements in skills that will be evaluated | 1 (16.7%) |
| Time       | Increase debriefing time                                                                                         | 1 (16.7%) |

In the dimension of self-confidence in learning, in turn, in six questions (75%) out of eight total questions, the participants said that they fully agreed, showing that most of them felt self-confident with learning. However, when asked if they knew how to use the simulation to learn skills, one participant answered "I neither agree nor disagree". Also in this dimension, in the question about

the instructor's responsibility to guide the student on learning the theme developed in the simulation during the class, the answer "I disagree" was also obtained from one participant. Figure 3 presents the data related to the evaluation of the activity and material resources, carried out with the participating leaders .

**Figure 3.** Evaluation of the activity by participants. Porto Alegre, RS, Brazil, 2024.



Rio Grande do Sul, Brazil, 2024.

**Source:** prepared by the authors (2024).

## ■ DISCUSSION

The results of this research indicated that realistic simulation played a critical role in promoting positive attitudes towards patient safety, with an emphasis on non-punitive responses to errors. Promoting a non-punitive approach is vital, as punitive measures can create an environment of fear and silence, compromising the transparency and learning necessary for care excellence.

The challenges for strengthening the safety culture observed in this study are in line with the findings of research carried out in other hospitals across the world<sup>(22,23)</sup>. The dimension “nonpunitive responses to errors,” selected for the development of the scenario in this study, reflects weaknesses similar to the latest ANVISA report on safety culture<sup>(24)</sup>. In a mixed-methods study conducted in Tunisia on professionals in a surgical center regarding patient safety culture, this dimension was shown to be detrimental to patient safety, receiving a score of 22.9% and demonstrating that it “needs improvement”<sup>(22)</sup>. In the United States, the same dimension was classified as neutral, with 64% of positive responses<sup>(23)</sup>. These results indicate that, although there are regional variations, addressing responses to error in a non-punitive manner is a challenge and a global need.

Clinical simulation has been increasingly used to reflect on work processes in the health area, and its use has shown positive results for the development of patient safety skills, as demonstrated in a study with health professionals in Switzerland<sup>(25)</sup>. The simulation scenario developed in this study was designed to promote experiential learning and the development of skills and competencies among participants, with potential application in other health institutions. The International Nursing Association Clinical Simulation & Learning (INACSL) recommends that simulation experiences be submitted to experts in the field to ensure their quality and relevance<sup>(26)</sup>; the validation of the scenario in this study, which achieved a Content Validity Index (CVI) of 100%, indicates the robustness of the proposed methodology and its applicability in clinical contexts.

The choice to work on “non-punitive responses to errors” reinforces the need for a safety approach that promotes open communication, learning from errors,

and continuous improvement. The ability of leaders to address errors in a non-punitive manner and promote patient safety suggests that realistic simulation can be a powerful educational strategy to positively influence care behaviors and practices.

The debriefing process, recognized for promoting reflection and improvement<sup>(27)</sup>, showed that leaders had adequate knowledge about safety culture and adopted constructive attitudes, such as promoting reporting and transparency. These findings corroborate the literature that emphasizes the importance of capable leadership to create a non-intimidating, supportive, and respectful safety environment<sup>(28)</sup>.

The results of the Student Satisfaction and Self-Confidence in Learning scale showed high levels of satisfaction and self-confidence, demonstrating the effectiveness of simulation as an educational methodology<sup>(29)</sup>, configuring it as an important active methodology for approaching situations that resemble those that occur in everyday professional life<sup>(30)</sup>. However, the report of one participant about doubts in the application of simulation for learning skills and the responsibility of the instructor highlights the need for adjustments and reinforcement of guidance during the learning process. This feedback is essential for the refinement of future simulation sessions, ensuring an even more effective educational experience.

The study has the following methodological limitations: the sample size, the possible “Hawthorne Effect” and the use of a professional actor who works in the city and in the institution researched.

## ■ CONCLUSION

The research highlighted the potential for developing a simulation scenario, based on everyday situations, as an effective strategy to promote experiential learning among leaders, corroborating the satisfaction and self-confidence of skills that underpin a culture of safety, especially with regard to non-punitive responses to errors within the Surgical Center.

The application of Simulation-Based Education (SBE) has proven to be a relevant intervention, offering a controlled environment for the exercise of behavioral skills essential to strengthening a positive safety culture.

The present study contributes to the understanding of Simulation-Based Education (SBE) as a strategy to promote a safety culture. Furthermore, the contribution lies in the evidence of the potential of simulation as an effective tool for behavioral change, promoting a more mature and consolidated safety culture in health institutions.

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## ■ Availability of data and material

Access to the dataset may be granted upon request to the corresponding author.

## ■ Authors' contribution

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