Original Article
https://doi.org/10.1590/1983-1447.2024.20230223.en

Construction and validation of an interprofessional simulated scenario for the identification and management of sepsis

Construção e validação de cenário simulado interprofissional de identificação e manejo da sepse

Construcción y validación de un escenario simulado interprofesional para la identificación y manejo de la sepsis.

Michèle da Silva Borges[a]
Taiciana Chagas Camacho[a]
Ana Luísa Petersen Cogo[a]

How to cite this article:
Borges MS, Camacho TC, Cogo ALP. Construction and validation of an interprofessional simulated scenario for the identification and management of sepsis. Rev Gaúcha Enferm. 2024;45:e20230223. https://doi.org/10.1590/1983-1447.2024.20230223.en

ABSTRACT

Objective: Build and validate a realistic interprofessional simulation scenario for the identification and management of sepsis by doctors and nurses.

Method: Methodological study developed in 2021, in two stages: construction of the guide and content validation by expert judges; and development of the simulation and validation of the scenario by doctors and nurses. 15 specialists participated in the research in the first stage and eight care professionals in the second stage. 0.8 was adopted as a parameter for the Content Validation Index (CVI).

Results: The scenario guide addressed nosocomial sepsis with an abdominal focus in an adult patient and its validation obtained a total CVI of 0.97. All areas evaluated in the simulation scenario obtained agreement indices greater than 0.8.

Conclusion: The construction and validation of the guide allowed the elaboration of guiding material for the development of an interprofessional simulated scenario, whose execution and validation process demonstrated its suitability in approaching the identification and management of sepsis by doctors and nurses. It is recommended to carry out future research evaluating its applicability to other situational contexts.

Descriptors: Simulation training. Interprofessional education. Validation study. Sepsis. Nursing.

RESUMO

Objetivo: Construir e validar um cenário de simulação realística interprofissional de identificação e manejo da sepse por médicos e enfermeiros.

Método: Estudo metodológico desenvolvido em 2021, dividido em duas etapas: construção do roteiro e validação do conteúdo por juízes especialistas; e desenvolvimento da simulação e validação do cenário por médicos e enfermeiros. Participaram da pesquisa 15 especialistas na primeira etapa e oito profissionais assistenciais na segunda etapa. Adotou-se 0,8 como parâmetro do Índice de Validação de Conteúdo (IVC).

Resultados: O roteiro do cenário abordou a sepse nosocomial com foco abdominal em paciente adulto e sua validação obteve IVC total de 0,97. Todas as áreas avaliadas no cenário de simulação obtiveram índices de concordância superiores a 0,8.

Conclusão: A construção e validação do roteiro permitiu a elaboração de material norteador para o desenvolvimento de cenário simulado interprofissional, cujo processo de execução e validação demonstrou a sua adequabilidade na abordagem da identificação e manejo da sepse por médicos e enfermeiros. Recomenda-se realizar pesquisas futuras avaliando sua aplicabilidade a outros contextos situacionais.

Descritores: Treinamento por simulação. Educação interprofissional. Estudo de validação. Sepse. Enfermagem.

RESUMEN

Objetivo: Construya y valide un escenario de simulación interprofesional realista para la identificación y el tratamiento de la sepsis por parte de médicos y enfermeras.

Método: Estudio metodológico desarrollado en 2021, dividido en dos etapas: construcción del guion y validación de contenido por jueces expertos; y desarrollo de la simulación y validación del escenario por parte de médicos y enfermeras. En la investigación participaron 15 especialistas en la primera etapa y ocho profesionales asistenciales en la segunda etapa. Se adoptó 0,8 como parámetro para el Índice de Validación de Contenido (CVI).

Resultados: El guión de escenario abordó la sepsis nosocomial con foco abdominal en un paciente adulto y su validación obtuvo un CVI total de 0,97. Todas las áreas evaluadas en el escenario de simulación obtuvieron índices de acuerdo superiores a 0,8.

Conclusión: La construcción y validación del guion permitió la elaboración de material orientador para el desarrollo de un escenario simulado interprofesional, cuyo proceso de ejecución y validación demostró su idoneidad en el abordaje de la identificación y manejo de la sepsis por parte de médicos y enfermeros. Se recomienda realizar futuras investigaciones evaluando su aplicabilidad a otros contextos situacionales.

Descriptores: Entrenamiento simulado. Educación interprofesional. Sepsis. Estudio de validación. Enfermería.

[a] Universidade Federal do Rio Grande do Sul; Escola de Enfermagem; Programa de Pós-Graduação em Enfermagem. Porto Alegre, RS, Brasil.

INTRODUCTION

Sepsis is considered a complex organic dysfunction caused by the body's exacerbated response to an infectious process[1]. In Brazil, in the period 2010-2019, more than one million hospitalizations and 463 thousand deaths from sepsis were recorded[2]; at a global level, the incidence was approximately 48.9 million cases and 11 million deaths in 2017 alone[3]. Identifying a septic condition is a complex process that requires up-to-date healthcare teams capable of intervening in a timely manner[1].

The Latin American Sepsis Institute (ILAS) currently recommends the use of the Sequential Organ Failure Assessment (SOFA) tool to identify probable septic conditions[4]. The function of the tool is to evaluate the performance of the body's different systems and assign them a score. To achieve this, the following parameters are considered: systolic blood pressure (SBP) <100 mmHg; respiratory rate >22 bpm; and Glasgow <15, in which each variable is equivalent to one point and scores ≥ 2 indicate a higher risk of mortality[4].

Although the parameters of the Systemic Inflammatory Response Syndrome (SIRS) are no longer part of the current criteria for defining sepsis, they remain of clinical value for identifying patients with infection and potential risk of progression to a septic condition; therefore, they are still used by health institutions[4]. The parameters considered are: core temperature, or axillary equivalent, >38.3ºC or <36ºC; heart rate >90 bpm; respiratory rate >20 rpm or partial pressure of carbon dioxide <32 mmHg; total leukocytes >12,000/mm^3 or <4,000/mm^3 or left shift >10%, in which the presence of at least two positive parameters configures SIRS[4].

Regardless of the tool used, it is essential that healthcare institutions invest in structuring initiatives capable of stimulating the continuous updating of their employees, since the ability to identify and intervene early in a septic condition is directly proportional to its clinical outcome[4]. The use of realistic simulation techniques can contribute in this regard, as it provides spaces for training and reflection in a safe and controlled environment, excluding the risks inherent in the development of skills in a real context and enabling the minimization of feelings of fear and anxiety when facing critical situations in clinical practice[5,6].

Conceptually, realistic simulation is a technique that reproduces aspects of the real world through immersion in a practical scenario[7]; although its implementation does not necessarily depend on major technological contributions, it is developed with the greatest possible fidelity to reality[8]. According to the good practices recommended by the International Nursing Association for Clinical Simulation and Learning (INACSL), the technique should include the stages of briefing, scenario and debriefing[9]. The briefing is the moment that precedes the simulation, in which the participants receive the necessary guidance about the activity. The scenario, also called design or scene, is the actual simulation. Debriefing, in turn, occurs immediately after the simulation, when a guided reflection and discussion takes place on the conduct taken during the simulation[9,10].

The use of the realistic simulation technique as a health education strategy allows the sharing of knowledge between different professional occupations, in order to exercise effective communication and improve the understanding of clinical practice issues, in addition to stimulating greater synergy between teams[11,12]. Such aspects are crucial when seeking to work on complex issues arising from the health context, reinforcing the attributes that govern work in an interprofessional team[13]. Based on this understanding, the present study aimed to build and validate a realistic interprofessional simulation scenario for the identification and management of sepsis by physicians and nurses.

METHOD

This is a methodological study[14], developed in two stages: 1) construction of a guide and validation of its content by expert judges and 2) development of the simulation and validation of the scenario by doctors and nurses. The research was carried out in a realistic simulation center of a hospital institution in the southern region of Brazil in 2021.

There is no consensus in the literature regarding the minimum number of expert judges to compose samples in validation studies. Therefore, the characteristics of the data collection instruments, training, qualification and availability to participate were taken into consideration as primary foundations for establishing the minimum number of samples in the two stages of the study[15].

This study followed the guidelines of the General Data Protection Law(16) and Resolution No. 466/12(17) by providing a Free and Informed Consent Form (FICF) to all participants, which contained the objectives of the study, probable benefits and risks involved in participation, the guarantee of anonymity and the freedom to decline participation at any time. The research was submitted to the Research Ethics Committee of the institution where the study was carried out and was approved under Protocol no.4,577,927 and Certificate of Presentation of Ethical Appreciation (CAAE) no. 42741520.8.0000.5335, in March 2021.

Stage 1 – Construction of the guide and content validation

The guide content was constructed through research in the literature and in health institution protocols developed according to the levels of evidence proposed by the Latin American Sepsis Institute (ILAS) [4] and the Surviving Sepsis Campaign (SSC)[1]. The structure of the guide followed good practice guidelines for the development of guides[1,18].

The theme defined was nosocomial sepsis with abdominal focus and the predictive parameters of Systemic Inflammatory Response Syndrome (SIRS) were used, in accordance with the current protocol at the institution where the research was carried out. The guide's main objective was to identify and manage nosocomial sepsis, while the secondary objectives were to identify the parameters of Systemic Inflammatory Response Syndrome (SIRS), initiation of a sepsis protocol and management of the patient until the appropriate antimicrobial therapy is established.

The expert judges were selected by convenience sampling[14] and the minimum number established was ten participants[15]. The judges were found through research in the area of activity specified in the Lattes Curriculum. The inclusion criteria used were having a higher education degree in medicine or nursing; a specialization degree, master's degree or doctorate; and experience in simulation, health education or hospital infection control. Invitation letters were sent by email to 30 expert judges; and for those who consented to participate, the ICF and the assessment instrument were sent. This collection stage took place between July and August 2021.

For data collection, an online instrument with a Likert-type scale was developed, consisting of 21 items distributed in three areas: objectives, structure/presentation and relevance, in which 1=No, 2=Maybe and 3=Yes; There was also space for the inclusion of comments and suggestions. For data analysis, only answers 3=Yes were considered[15].

Stage 2 – Development of the simulation and validation of the scenario

The planning and development of the simulation followed the guidelines of the International Nursing Association for Clinical Simulation and Learning[9] and its organization had the following structure: five-minute briefing, 15-minute simulation and 20-minute debriefing. The simulation center where the research was carried out had a high-fidelity mannequin, multi-parameter monitor and tablet to control the simulator's actions. Observation of the simulation was carried out through a room attached to the simulation environment, which had a mirrored wall and an audio reception system.

The simulation scenario was facilitated by one of the authors of the research, trained in realistic simulation instruction and who was a nurse hired by the Institution and was authorized to access the Laboratory due to restrictions imposed during the pandemic. This nurse worked in the Hospital Infection Control Service, without working directly with the professionals participating in the simulation scenario. The facilitator controlled the mannequin's responses through a control room equipped with a mirrored wall and an audio and video system.

Convenience sampling was used[14] and the minimum number of eight professionals was established[15]. The selection criteria included being a clinical nurse who performs his/her activities in clinical and surgical inpatient units or being an internal medicine resident physician, as well as having completed previous training on sepsis through the institutional continuing education program. Invitations were sent by email to eight professionals belonging to the institution's staff and working in units that provide care for patients discharged from the Emergency Service. After accepting to participate in the research, at the simulation center, participants were informed about the purpose of the activity and then FICF was read, delivered and signed. The simulation scenario took place in September 2021.

The Simulation Design Scale, developed by the National League for Nursing (NLN) and validated for Portuguese[19], was used for data collection. Its purpose is to enable the assessment of the structuring of realistic simulation scenarios. This is a Likert-type scale and consists of 20 items, distributed in five areas: objectives/information"; "support"; "problem solving"; "feedback/reflection"; and "realism", in which 1=strongly disagree, 2=disagree, 3=neutral, 4=agree and 5=strongly agree. For data analysis, only the answers 4=agree and 5=strongly agree were considered[15].

During data collection, given the health recommendations in force at the research institution due to the COVID-19 pandemic, access to shared teaching areas, as well as the number of simultaneous participants, were restricted. At that time, the Specialized Service in Safety Engineering and Occupational Medicine (SESMT) and the Hospital Infection Control (CIH) established a restriction to a maximum of four participants when carrying out realistic simulations, as well as the use of personal protective equipment and physical distancing.

To analyze the data collected in stages 1 and 2 of the research, the Content Validation Index (CVI) was used, which expresses the proportion of agreement between experts on

certain aspects of an instrument[15]. The CVI calculation is carried out by adding the number of responses considered in the evaluation, followed by dividing the result by the total number of respondents. The minimum agreement value established in this research was 0.80, respecting the recommendations for studies with six or more expert judges[15].

RESULTS

Stage 1 – Construction of the guide and content validation

The structure of the guide included a detailed description of the necessary materials, ambiance, simulation dynamics and specific actions expected according to the participating professional occupation (Chart 1). The clinical case of the simulation was a 49-year-old male patient weighing 75 kg, in the postoperative period of colectomy for diverticulitis, admitted for 10 days to a surgical inpatient unit. The patient had acute abdominal pain, purulent drainage oozing from a surgical wound, axillary temperature of 39ºC, change in bowel habits and no urine output for the past eight hours, with no history of allergies.

Fifteen of the invited participants agreed to participate in the study, of which 10 (67%) were nurses and five (33%) were doctors. Regarding academic qualifications, two (13%) had a doctorate; three (20%) had a master's degree; and seven (47%) had a *lato sensu* specialization or medical residency. Five (33%) stated that they had experience in hospital infection control, four (26%) in health education and three (20%) in realistic simulation. Two specialists (13%) worked in hospital infection control services and one (7%) in health education. All (100%) had institutional links with different hospital or teaching institutions in the southern region of Brazil and declared that they were aware of the guidelines for identifying and managing sepsis, in addition to the care protocols on the subject.

The guide obtained a total CVI of 0.97 (Table 1). The "objectives" area obtained a CVI of 0.94, with the lowest agreement rates related to the scientific nature of the information and scope of the content, both with 0.86. The "structure/presentation" area obtained a CVI of 0.98, with the lowest agreement values related to the items referring to the attractions of the scenario for maintaining the attention of participants and the evidence provided for the timely identification and management of sepsis, both with 0.93. The "relevance" area obtained maximum agreement among experts, with CVI 1.0.

The experts' comments and/or suggestions were organized according to the occupation in which they were made (Chart 2).

Stage 2 – Development of the simulation and validation of the scenario

Four (50%) professionals with a nursing degree and four (50%) professionals with a medical degree participated in this stage. All (100%) denied having previous experience in simulation at any level of education. Two meetings were held to develop the simulation and the participants were organized into two groups: one of actors and the other of observers. Each simulation had a doctor and a nurse acting and a doctor and a nurse as observers, with the order defined by the professionals themselves.

After the definition of the groups, the briefing stage for the acting participants would begin, with the presentation of the physical structure of the scenario and the clinical case, which was limited to the patient's current state, vital signs and context. The observers followed the explanations in the room attached to the simulation environment. At the end of the simulation, all participants gathered in the observation room, together with the facilitator, and the debriefing stage began. After the debriefing, the professionals who participated as actors answered the Simulation Design Scale.

The Simulation Design Scale obtained a total CVI of 0.98 (Table 2). The areas "objectives/information", "support", "problem solving" and "feedback/reflection" obtained maximum agreement among professionals, with a CVI of 1.0. The "realism" area obtained a CVI of 0.93. In the debriefing, participants addressed some counterpoints between the simulation and the reality experienced by them in their daily contexts, such as weaknesses in the identification of SIRS parameters by nursing technicians and in the identification and management of sepsis by non-clinical medical teams.

Chart 1 – Guide for the development of a simulated scenario for the identification and management of sepsis by physicians and nurses. Porto Alegre, Rio Grande do Sul, Brazil, 2023.

Simulated scenario guide for the identification and management of sepsis by medical and nursing staff:	
Ambiance: - Adult hospital bed (bed, bedside table, armchair) - Bench with sink and drawer for storing materials	
Materials used: - Stethoscope - Tray - Protective goggles - Bottle of alcohol gel - Sachets of alcohol swabs - Bottle of standard disinfectant - Paper towel - 3ml, 5ml and 10ml syringes - 40x12 aspiration needles - 20ml bottles of distilled water - 10ml bottles of saline solution - Saline solution bottles (100ml and 250ml)	– Gauze packs – Micropore – Procedure gloves – Sterile gloves – Indwelling bladder catheterization kit – Indwelling bladder catheter – Catheters for venipuncture – Catheter protection film – Macrodrip IV administration set – Valved connector for venous access – Blood collection vials – Sample Collection Vials
Fictitious documents: - Medical record - ID bracelet - CBC report - Lactate report - Creatinine report	– C-reactive protein report – Urea report – Abdominal ultrasound report – Abdominal X-ray report
Fictitious medications: - Anidulafungin - Cefepime - Metronidazole	– Dipyrone – Xylocaine gel – Ringer's lactate
Specific items: • Whitish solution to simulate purulent secretion from the surgical wound	
Simulation dynamics	
Participant's conduct:	**Manikin actions:**
If verbal contact with the patient is attempted	Moaning, says he/she feels a lot of pain
If questions are asked about diuresis	Says he/she hasn't urinated for more than 8 hours
If vital signs are checked (available on multiparameter monitor)	Vital signs parameters*: Sa.O2: 98% HR: 92 bpm RR: 22 rpm AT: 39ºC BP: 120x80mmHg

Chart 1 – Cont.

Simulated scenario guide for the identification and management of sepsis by medical and nursing staff:	
If abdominal palpation or inspection of the surgical wound is performed	Acute pain reaction to palpation. Decreased level of consciousness. Vital signs parameters*: Sa.O2: 95% HR: 105 bpm RR: 23 rpm AT:40ºC BP: 100x60mmHg
If laboratory or imaging tests are requested	Vital signs parameters remain altered. Reports with results compatible with sepsis will be made available on the computer.
If an evaluation is requested from the surgical team	Vital signs parameters remain altered. The participant will receive a notice that the team is in surgery and will only be available in a few hours.
If an institutional sepsis protocol is initiated, but antimicrobial therapy is not initiated.	Vital sign parameters remain altered. End of scenario.
If an institutional sepsis protocol is initiated and antimicrobial therapy is started	New vital signs parameters*: Sa.O2: 99% HR: 73 bpm RR: 20 rpm AT:37.2ºC BP: 120x80mmHg End of scenario
Actions expected within the simulation	
Participant doctor:	- Opening of the sepsis protocol; - Evaluate the surgical wound and identify the drainage of purulent secretion; - Request blood cultures from two different sites, complete blood count, lactate, C-reactive protein and creatinine; - Request abdominal imaging tests; - Determine treatment for nosocomial sepsis and prescribe antibiotic therapy according to institutional protocol: vancomycin (20-25mg/kg) + Meropenem (1mg to 2mg), preferably associated with Anidulafungin (200mg – attack).
Participant nurse:	- Identify the drainage of purulent secretion from the surgical wound; - Identify vital sign parameters compatible with Systemic Inflammatory Response Syndrome (SIRS); - Identify symptoms of organic dysfunction (oliguria and decreased level of consciousness) and contact the medical team; - Immediately start the treatment prescribed by the medical team.

*Legend: Sa.O2: oxygen saturation; HR: heart rate; RR: respiratory rate; AT: axillary temperature; BP: blood pressure.
Source: research data.

Table 1 – Validation of the realistic simulation scenario guide by experts (n=15). Porto Alegre, Rio Grande do Sul, Brazil, 2023.

OBJECTIVES			
Items evaluated	**1 = No 2 = Maybe n (%)**	**3 = Yes n (%)**	**CVI***
1- The contents covered are consistent with the objectives of the realistic simulation scenario	0 (0)	15 (100)	1.0
2 – The learning objectives are clear and concise	0 (0)	15 (100)	1.0
3 – The scenario content facilitates critical thinking	0 (0)	15 (100)	1.0
4 – The information presented is scientifically correct, according to the institutional protocol	2 (13)	13 (87)	0.86
5 – There is a logical sequence of proposed content	1 (7)	14 (93)	0.93
6 – The information presented in the scenario covers the content necessary for identifying and managing sepsis	2 (13)	13 (87)	0.86
7 – The information/content is important for the quality of the care provided	1 (7)	14 (93)	0.93
8 – The objective of the scenario can promote and/or characterize changes in behavior and attitude of participants	0 (0)	15 (100)	1.0
		CVI* total area:	**0.94**
STRUCTURE/PRESENTATION			
Items evaluated	**1 = No 2 = Maybe n (%)**	**3 = Yes n (%)**	**CVI***
1- The scenario guide is appropriate for doctors and nurses (answer according to your occupation)	0 (0)	15 (100)	1.0
2- The language used is easily understood by doctors and nurses (answer according to your occupation)	0 (0)	15 (100)	1.0
3- The scenario has an attractive visual aspect that keeps the attention of doctors and nurses (answer according to your occupation)	1 (7)	14 (93)	0.93
4- The information is presented in a structured and objective manner	0 (0)	15 (100)	1.0
5- The way the scenario is presented contributes to the learning of doctors and nurses (answer according to your occupation)	0 (0)	15 (100)	1.0
6- Contains all the evidence to identify and manage sepsis immediately and accurately	1 (7)	14 (93)	0.93

Table 1 – Cont.

STRUCTURE/PRESENTATION			
Items evaluated	**1 = No 2 = Maybe n (%)**	**3 = Yes n (%)**	**CVI***
7- Contextual details provide clues based on desired outcomes	0 (0)	15 (100)	1.0
8- The patient profile provides sufficient data to make a clinical judgment	0 (0)	15 (100)	1.0
CVIC* total area:	**0.98**		
RELEVANCE			
Items evaluated	**1 = No 2 = Maybe n (%)**	**3 = Yes n (%)**	**CVI***
1- The scenario allows the transfer of knowledge	0 (0)	15 (100)	1.0
2- The theme portrays key aspects that should be reinforced	0 (0)	15 (100)	1.0
3- The model allows the transfer and generalization of learning to different institutional contexts	0 (0)	15 (100)	1.0
4- The scenario guide proposes the construction of knowledge	0 (0)	15 (100)	1.0
5- It can be used by doctors and nurses as a guide for training related to the identification and/or management of sepsis.	0 (0)	15 100	1.0
		CVI* total area:	**1.0**
		CVI* total instrument	**0.97**

*Content Validation Index.
Source: research data, 2023.

Chart 2 – Comments and/or suggestions from experts on the validation of the realistic simulation scenario guide (n=15). Porto Alegre, Rio Grande do Sul, Brazil, 2023.

Occupation	Comment and/or Suggestion	n (%)
Objectives	Include criteria for organ dysfunction based on the calculation of the variation in the SOFA score	2 (13)
Structure/Presentation	Include the identification of a fictitious patient or simulated scenario in laboratory test reports	1 (7)
Relevance	–	–

Source: research data, 2024.

Table 2 – Simulation Design Scale (n=8). Porto Alegre, Rio Grande do Sul, Brazil, 2023.

OBJECTIVES/INFORMATION			
Items evaluated	**1 – I Totally Disagree 2 – I Disagree 3 – Neutral n (%)**	**4 – I Agree 5 – I Totally Agree n (%)**	**CVI***
1. At the beginning of the simulation, sufficient information was provided to offer guidance and encouragement.	0 (0)	8 (100)	1.0
2. I clearly understood the purpose and objectives of the simulation	0 (0)	8 (100)	1.0
3. The simulation provided sufficient and clear information for me to solve the problem situation	0 (0)	8 (100)	1.0
4 Sufficient information was provided during the simulation	0 (0)	8 (100)	1.0
5. The clues were appropriate and targeted to promote my understanding	0 (0)	8 (100)	1.0
		Total CVI* of the area:	**1.0**
SUPPORT			
Items evaluated	**1 – I Totally Disagree 2 – I Disagree 3 – Neutral n (%)**	**4 – I Agree 5 – I Totally Agree n (%)**	**CVI***
6. Support was offered in a timely manner	0 (0)	8 (100)	1.0
7. My need for help was recognized	0 (0)	8 (100)	1.0
8. I felt supported by the mediator during the simulation	0 (0)	8 (100)	1.0
9. I was supported in the learning process	0 (0)	8 (100)	1.0
		Total CVI* of the area:	**1.0**
PROBLEM SOLVING			
Items evaluated	**1 – I Totally Disagree 2 – I Disagree 3 – Neutral n (%)**	**4 – I Agree 5 – I Totally Agree n (%)**	**CVI***
10. Autonomous problem solving has been made easier	0 (0)	8 (100)	1.0
11. I was encouraged to explore all the possibilities of simulation	0 (0)	8 (100)	1.0
12. The simulation was designed for my specific level of knowledge and skills	0 (0)	8 (100)	1.0

Table 2 – Cont.

PROBLEM SOLVING			
Items evaluated	**1 – I Totally Disagree 2 – I Disagree 3 – Neutral n (%)**	**4 – I Agree 5 – I Totally Agree n (%)**	**CVI***
13. The simulation allowed me the opportunity to prioritize medical and nursing evaluations and care	0 (0)	8 (100)	1.0
14. The simulation provided me with an opportunity to set goals for my patient care	0 (0)	8 (100)	1.0
		Total CVI* of the area:	**1.0**
FEEDBACK/REFLEXION			
Items evaluated	**1 – I Totally Disagree 2 – I Disagree 3 – Neutral n (%)**	**4 – I Agree 5 – I Totally Agree n (%)**	**CVI***
15. The feedback provided was constructive	0 (0)	8 (100)	1.0
16. Feedback was provided in a timely manner	0 (0)	8 (100)	1.0
17. The simulation allowed me to analyze my behavior and actions	0 (0)	8 (100)	1.0
18. After the simulation, there was an opportunity to obtain guidance/feedback from the mediator in order to build knowledge at another level.	0 (0)	8 (100)	1.0
		Total CVI* of the area:	**1.0**
REALISM			
Items evaluated	**1 – I Totally Disagree 2 – I Disagree 3 – Neutral N (%)**	**4 – I Agree 5 – I Totally Agree n (%)**	**CVI***
19. The scenario resembled a real-life situation	1 (12.5)	7 (87.5)	0.87
20. Real-life factors, situations and variables were incorporated into the simulation scenario	0 (0)	8 (100)	1.0
		Total CVI* of the area:	**0.93**
		Total CVI* of the instrument:	**0.98**

*Content Validation Index.
Source: research data, 2024.

DISCUSSION

The challenges inherent in the context of health care require the development and maintenance of interprofessional and permanently qualified care teams, capable of acting in the most diverse situations, making it essential to structure permanent education strategies that stimulate continuous improvement and the development of different skills[11,13]. Therefore, active methodologies, such as realistic simulation, can contribute to the improvement of technical and non-technical skills in a safe and controlled context. However, the development of these methodologies requires methodological rigor in order to achieve their educational purposes[11,20,21]. Therefore, it is essential not only to develop simulation scenarios, but also to validate them with experts and the target audience, in order to guarantee their integrity and alignment with best practices[22–24].

In validating the simulation guide for this research, the agreement rates closest to the established cut-off value are related to the scientific subsidies used and the scope of the scenario employed. Such evaluations are based on the divergence between the currently recommended sepsis diagnostic methods and the methods used as a basis for constructing the guide. Although the current guidelines of the Latin American Institute of Sepsis (ILAS) recommend the use of the Sequential Organ Failure Assessment (SOFA)[4], guided by the prediction of mortality, the health institution where the research was carried out uses the parameters of the Systemic Inflammatory Response Syndrome (SIRS) as a protocol for diagnosing sepsis. Therefore, it was necessary to adapt the theoretical support used in the development of the simulation guide, to develop the technique as close as possible to the reality experienced by the participating professionals[25].

In validating the structure and presentation of the simulation guide, the experts were unanimous in evaluating the guide as capable of favoring the construction and sharing of interprofessional knowledge. This corroborates the importance of planning considering the environment, equipment and inputs available, as well as the construction of the patient's clinical history, enabling physical assessment, skills training, critical thinking and handling of the simulated situation[23,26].

In the process of validating the simulation scenario, its objectives and the information provided during the development of the technique were agreed upon by all participants, who stated that the scenario was coherent, clear and provided all the necessary guidance in line with the proposed objectives. Furthermore, participants felt supported during the simulation, which favored their learning process and encouraged them to explore all the possibilities of the scenario, which was assessed as appropriate to the level of knowledge and skills of the professionals. Such results are similar to those in the literature regarding the use of simulation in health education, which evaluate the technique as a tool that enables the expansion of the relationship between theory and practice, optimizing skills and abilities and, thus, consolidating knowledge and increasing the satisfaction levels of the participants[27,28].

In realistic simulation, debriefing is a fundamental step in the learning process, as it is a moment of reflection that explores the emotions and clinical reasoning experienced during the simulation[29]. Therefore, planning and structuring this stage is essential, aiming to provide feedback to participants through an approach that enables the perception of collective and individual actions, with a view to developing and improving skills within a safe and non-judgmental context.

The ability of simulation to reproduce reality is one of the aspects that favors immersion in the activity[28,30]. However, there may be inconsistencies between daily reality and that reproduced by the technique. When evaluating the similarity of the scenario to a real situation, there was a perception of low reliability of the simulation, the background of which were the divergences in the therapeutic possibilities available in the simulation and those used in the daily routine of professionals in their work units, exposing the participants' lack of knowledge of the current institutional protocol for the management of sepsis.

A limitation of this study is the fact that the simulation was carried out only with nursing and medical professionals, and it is possible to expand it to other professional occupations. Another aspect that deserves consideration is the fact that the research was carried out with experts geographically restricted to the southern region of Brazil. Thus, as a recommendation for future studies, it is suggested that the guide for the realistic simulation scenario be planned and validated, encompassing the other professional occupations involved in the sepsis diagnosis and management process, in addition to the geographical expansion of the specialists included in the sample. It should be noted that during the execution of this study there were restrictions on access to the simulation laboratory due to the COVID-19 pandemic, which made it impossible for another professional to participate as a facilitator.

CONCLUSION

The construction and validation of the guide allowed the preparation of material that leads the development of an interprofessional simulated scenario. The implementation and validation process, in turn, demonstrated its suitability in approaching the identification and management of sepsis by physicians and nurses. However, further studies are needed to assess its applicability to other situational contexts.

REFERENCES

1. Evans L, Rhodes A, Alhazzani W, Antonelli M, Coopersmith CM, French C, et al. Surviving sepsis campaign: international guidelines for management of sepsis and septic shock 2021. Intensive Care Med. 2021;47:1181-247. https://doi.org/10.1007/s00134-021-06506-y
2. Almeida NR, Pontes GF, Jacob FL, Deprá JV, Porto JP, Lima FR, et al. Analysis of trends in sepsis mortality in Brazil and by regions from 2010 to 2019. Rev Saúde Pública. 2022;56(25):1-13. https://doi.org/10.11606/s1518-8787.2022056003789
3. Rudd KE, Johnson SC, Agesa KM, Shackelford KA, Tsoi D, Kievlan DR, et al. Global, regional, and national sepsis incidence and mortality, 1990-2017: analysis for the Global Burden of Disease Study. Lancet. 2020;395(10219):200-11. https://doi.org/10.1016/S0140-6736(19)32989-7
4. Instituto Latino Americano de Sepse (Ilas). Implementação de protocolo gerenciado de sepse – Protocolo clínico: atendimento ao paciente adulto com sepse/choque séptico. Instituto Latino Americano de Sepse; 2018 [cited 2023 Jul 10];1-14. Available from: https://ilas.org.br/wp-content/uploads/2022/02/protocolo-de-tratamento.pdf
5. Mesquita HC, Santana BS, Magro MC. Effect of realistic simulation combined to theory on self-confidence and satisfaction of nursing professionals. Esc Anna Nery. 2019;23(1):e20180270:1-6. https://doi.org/10.1590/2177-9465-EAN-2018-0270
6. Keane JM, Franklin NF, Vaughan B. Simulation to educate healthcare providers working within residential age care settings: a scoping review. Nurse Educ Today. 2020;85:104228. https://doi.org/10.1016/j.nedt.2019.104228
7. Gaba DM. The future vision of simulation in health care. BMJ Qual Saf. 2004;13:i2-i10. https://doi.org/10.1136/qshc.2004.009878
8. Taglietti M, Zilly A, Boscarioli C. Diagnósticos e percepções de uma formação docente sobre simulação realística de alta fidelidade na área da saúde. Rev Ciênc Méd Biol. 2021;20(2):314-20. https://doi.org/10.9771/cmbio.v20i2.39001
9. Internacional Nursing Association for Clinical Simulation and Learning (INACSL). Onward and Upward: introducing the healthcare simulation standards of best practice. Clin Simul Nurs. 2021;58:1-4. https://doi.org/10.1016/j.ecns.2021.08.006
10. Oliveira SN, Massaroli A, Martini JG, Rodrigues J. From theory to practice, operating the clinical simulation in Nursing teaching. Rev Bras Enferm. 2018;71(Suppl4):1791-8. https://doi.org/10.1590/0034-7167-2017-0180
11. Cogo AL, Lopes EF, Perdomini FR, Flores GE, Santos MR. Building and developing realistic simulation scenarios on safe drug administration. Rev Gaúcha Enferm. 2019;40(esp):e20180175:1-5. https://doi.org/10.1590/1983-1447.2019.20180175
12. Santos Júnior GR, Silva LH, Araújo CN, Brito JD, Santana AL, Costa CW et al. Realistic Simulation in the context of Interprofessional Education. Saúde Colet. 2021;11(65):6110-6114. https://doi.org/10.36489/saudecoletiva.2021v11i65p6110-6119
13. Peduzzi M, Agreli HLF, Silva JAM. Trabalho em equipe: uma revisita ao conceito e a seus desdobramentos no trabalho interprofissional. Trab Educ Saúde. 2020;18(s1):e0024678. https://doi.org/10.1590/1981-7746-sol00246
14. Polit DF, Beck CT. Tipos específicos de pesquisas. In: Fundamentos de pesquisa em enfermagem: avaliação de evidências para a prática da enfermagem. 9.ed. Porto Alegre: Artmed, 2019. p. 330-337.
15. Alexandre NM, Coluci MZ. Validade de conteúdo nos processos de construção e adaptação de instrumentos de medidas. Ciênc Saúde Colet. 2011;16(7):3061-8. https://doi.org/10.1590/S1413-81232011000800006
16. Presidência da República (BR). Lei Nº 13.709, de 14 de agosto de 2018. Lei Geral de Proteção de Dados Pessoais (LGPD). 2018 [cited 2023 Sep 04];(157 Seção 1):59-64. Available from: https://www.planalto.gov.br/ccivil_03/_ato2015-2018/2018/lei/l13709.htm
17. Ministério da Saúde (BR), Conselho Nacional de Saúde (CNS). Resolução Nº 466, de 12 de dezembro de 2012. Aprova diretrizes e normas regulamentadoras de pesquisas envolvendo seres humanos. 2013 [cited 2023 Sep 04];(112 Seção 1):59-62. Available from: https://conselho.saude.gov.br/resolucoes/2012/Reso466.pdf
18. Alinier G. Developing high-fidelity health care simulation scenarios: a guide for educators and professionals. Simul Gaming. 2011;42(1):9–26. https://doi.org/10.1177/104687810935
19. Almeida RG, Mazzo A, Martins JC, Pedersoli CE, Fumincelli L, Mendes IA. Validation for the portuguese language of the simulation design scale. Texto Contexto Enferm. 2015;24(4):934-40. https://doi.org/10.1590/0104-0707201500004570014
20. Lien RY, Cheng CG, Hung SH, Wang CY, Lin HC, Lu SF, et al. The effect of the knowledge, skills, and attitudes from nurse training using in situ simulation in an intensive care unit. Healthcare. 2023;11(21):1-11. https://doi.org/10.3390/healthcare11212851
21. Qingqing L, Xilin Z, Laiyu X, Qirong C, Fangyi Z, Lingli P. The effectiveness of education strategies for nurses to recognise and manage clinical deterioration: a systematic review. Nurse Educ Today. 2023;126:105838. https://doi.org/10.1016/j.nedt.2023.105838
22. Andrade PO, Oliveira SC, Morais SC, Guedes TG, Melo GP, Linhares FM. Validation of a clinical simulation setting in the management of postpartum haemorrhage. Rev Bras Enferm. 2019;72(3):624-631. https://doi.org/10.1590/0034-7167-2018-0065
23. Kaneko RM, Lopes HB. Realistic health care simulation scenario: what is relevant for its design?. Rev Esc Enferm USP. 2019;3:e03453:1-8. https://doi.org/10.1590/S1980-220X2018015703453
24. Silva LM, Diogo LP, Vieira LB, Michielin FC, Santaren MD, Machado ML. Performance of scores in the prediction of clinical outcomes in patients admitted from the emergency service. Rev Latino-Am Enfermagem. 2021;29:e3479:1-10. https://doi.org/10.1590/1518-8345.4722.3479
25. Carvalho LR, Zem-Mascarenhas SH. Construction and validation of a sepsis simulation scenario: a methodological study. Rev Esc Enferm USP. 2020;54:e03638:1-9. https://doi.org/10.1590/S1980-220X2019021603638
26. Amarijo CL, Silva CD, Mota MS, Figueira AB, Acosta DF, Silva JH. New horizons in higher education: realistic simulation as a teaching method. RSD. 2021;10(4):e18710414057:1-6. https://doi.org/10.33448/rsd-v10i4.14057

27. Jefferson GG, Samah AAA, Dena MA. The acquired critical thinking skills, satisfaction, and self confidence of nursing students and staff nurses through high-fidelity simulation experience. Clin Simul Nurs. 2022;64:24-30. https://doi.org/10.1016/j.ecns.2021.11.008
28. Oliveira JN, Carneiro AC, Sestelo M. Debriefing analysis in realistic simulation in a health institution of medical teaching Int J Health Educ. 2022;6:e4390:1-14. https://doi.org/10.17267/2594-7907ijeh.2022.e4390
29. Young-Ju K, Jee-Hye Y. The utilization of debriefing for simulation in healthcare: a literature review. Nurse Educ Pract. 2020;43:102698. https://doi.org/10.1016/j.nepr.2020.102698
30. Dias AAL, Souza RS, Eduardo AHA, Felix AMS, Figueiredo RM. Validation of two clinical scenarios for simulation-based learning for the prevention and control of healthcare-associated infections. Rev Eletron Enferm. 2022;24:70072. https://doi.org/10.5216/ree.v24.70072

Authors' contribution:

Conceptualization – Michèle da Silva Borges; Ana Luísa Petersen Cogo.
Data curation – Michèle da Silva Borges; Ana Luísa Petersen Cogo.
Formal analysis- Michèle da Silva Borges; Ana Luísa Petersen Cogo.
Investigation – Michèle da Silva Borges.
Methodology – Michèle da Silva Borges; Ana Luísa Petersen Cogo.
Supervision – Ana Luísa Petersen Cogo.
Writing – original draft – Michèle da Silva Borges; Taiciana Chagas Camacho; Ana Luísa Petersen Cogo.
Writing – review and editing – Michèle da Silva Borges; Taiciana Chagas Camacho; Ana Luísa Petersen Cogo.

The authors declare that there is no conflict of interest.

Corresponding author:

Michèle da Silva Borges
E-mail: micheledasborges@gmail.com

Associate editor:
Luccas Melo de Souza

Editor-in-chief:
João Lucas Campos de Oliveira

Received: 10.06.2023
Approved: 03.08.2024