

Clinical simulation: construction and validation of a script for Basic Life Support in adults

Simulação clínica: construção e validação de roteiro para o Suporte Básico de Vida no adulto.

Simulación clínica: construcción y validación de un guion de Soporte Vital Básico en adultos

Juliana da Silva Garcia Nascimento^I, Kleiton Gonçalves do Nascimento^{II}, Daniela da Silva Garcia Regino^{III}, Mateus Goulart Alves^{IV}, Jordana Luiza Gouvêa de Oliveira^V, Maria Celia Barcellos Dalri^{VI}

Abstract: Objective: to develop and validate a script to plan and execute the first stage of the clinical simulation of Basic Life Support in adults in cardiorespiratory arrest: the preparation and its pre-simulation and pre-briefing/briefing phases. **Method:** methodological study performed through an integrative review with a sample of seven primary studies. Afterwards, content validation was carried out in June 2020 with 16 nurses. **Results:** the script consisted of pre-simulation and pre-briefing/briefing and achieved a total Content Validity Index of 0.90. **Conclusion:** a script was developed addressing the title, execution time, definition and objectives of the pre-simulation and pre-briefing/briefing, target audience, learning objectives, material resources, procedure and references, considered valid in its content to plan and execute the first stage of the clinical simulation of Basic Life Support in adults, that is, its preparation.

Descriptors: Nurses; Students, Nursing; Cardiopulmonary Resuscitation; Simulation Training; Validation Study

Resumo: Objetivo: desenvolver e validar um roteiro para planejar e executar a primeira etapa da simulação clínica do Suporte Básico de Vida no adulto em parada cardiorrespiratória: a preparação e suas fases de pré-simulação e pré-briefing/briefing. **Método:** estudo metodológico realizado por meio de revisão integrativa com uma amostra de sete estudos primários. Após, realizou-se a validação de conteúdo, em junho de 2020, com 16 enfermeiros. **Resultados:** o roteiro foi composto por pré-simulação e pré-briefing/briefing e atingiu um Índice de Validade de Conteúdo total de 0,90. **Conclusão:** desenvolveu-se um roteiro que aborda título, tempo de execução, definição e

^INurse, Master, University of São Paulo – Ribeirão Preto School of Nursing (EERP), Ribeirão Preto, São Paulo, Brazil. E-mail: mestradounesp28@yahoo.com.br, Orcid: <https://orcid.org/0000-0003-1118-2738>

^{II}Nurse, Master, Federal University of Triângulo Mineiro (UFTM), Uberaba, Minas Gérias, Brazil. E-mail: kleiton_uniube@yahoo.com.br, Orcid: <https://orcid.org/0000-0002-2717-6837>

^{III}Nurse, Doctor, Brasil University, Fernandópolis, São Paulo, Brazil. E-mail: garciaregino@gmail.com, Orcid: <https://orcid.org/0000-0003-0045-7783>

^{IV}Nurse, Master, University of Franca, Franca, São Paulo, Brazil. E-mail: mateusgoulartalves@gmail.com, Orcid: <https://orcid.org/0000-0003-0680-6817>

^VNurse, Specialist, University of São Paulo – Ribeirão Preto School of Nursing (EERP), Ribeirão Preto, São Paulo, Brazil. E-mail: jordana.oliveira@usp.br, Orcid: <https://orcid.org/0000-0001-5905-8993>

^{VI}Nurse, Doctor, University of São Paulo – Ribeirão Preto School of Nursing (EERP), Ribeirão Preto, São Paulo, Brazil. E-mail: macdalri@eerp.usp.br, Orcid: <https://orcid.org/0000-0002-8173-8642>

objetivos da pré-simulação e pré-*briefing/briefing*, público-alvo, objetivos de aprendizagem, recursos materiais, procedimento e referências, considerado válido em seu conteúdo para planejar e executar a primeira etapa da simulação clínica do Suporte Básico de Vida no adulto, ou seja, a preparação.

Descritores: Enfermeiras e Enfermeiros; Estudantes de Enfermagem; Reanimação Cardiopulmonar; Treinamento por Simulação; Estudo de Validação

Resumen: Objetivo: desarrollar y validar un guion para planificar y ejecutar la primera etapa de la simulación clínica de Soporte Vital Básico en adultos en paro cardiorrespiratorio: la preparación y sus fases de pre-simulación y pre-*briefing/briefing*. **Método:** estudio metodológico realizado mediante una revisión integradora con una muestra de siete estudios primarios. Subsiguientemente, se realizó la validación de contenido en junio de 2020 con 16 enfermeros. **Resultados:** el guion consistió en pre-simulación y pre-*briefing/briefing* y alcanzó un Índice de Validez de Contenido total de 0.90. **Conclusión:** se elaboró un guion que aborda el título, tiempo de ejecución, definición y objetivos de la pre-simulación y pre-*briefing/briefing*, público destinatario, objetivos de aprendizaje, recursos materiales, procedimiento y referencias, considerado válido en su contenido para planificar y ejecutar la primera etapa de la simulación clínica de Soporte Vital Básico en adultos, es decir, su preparación.

Descriptor: Enfermeras y Enfermeros; Estudiantes de Enfermería; Reanimación Cardiopulmonar; Entrenamiento Simulado; Estudio de Validación

Introduction

Obtaining the attention of a nursing student or nursing professional during an educational practice is a challenge for any educator, because, generally, learners crave exposure to innovative and active teaching strategies, capable of increasing satisfaction and even pleasure in their educational efforts.¹ In order to meet this demand, a teaching and learning strategy called clinical simulation in health has been highlighted.² It is defined as an educational strategy that exposes participants to hypothetical scenarios that simulate the reality of clinical practice.³

In order to make this strategy viable, it is essential to conceptualize and understand its stages, called preparation, participation, and debriefing.⁴ The preparation stage is divided into two phases: pre-simulation, which covers the preparation of the student for the topic proposed in clinical simulation, by sending educational materials and also skills training, and the pre-*briefing/briefing*, configured by the interaction between the facilitator and students, immediate to the scene, to clarify the scenario, objectives and learning roles.⁵

In turn, the participation stage involves performing the proposed scenario, and the debriefing is characterized by a discussion/reflection process, performed during or after the scenario, capable of establishing the development of clinical competence.⁵ The articulation of the three stages of clinical simulation makes possible the teaching and learning process of complex topics such as Basic Life Support (BLS) for nursing, by stimulating the student to be the active subject of his/her learning and safely experience situations that he/she will experience in practice.⁶

Accordingly, the preparation stage of clinical simulation is a valuable mechanism for the scientific deepening and study of BLS before the proposed experience and for the clarification of the participant about the simulation scenario, in an objective, didactic and humanized manner.⁶⁻⁷ For the training of nurses and the improvement of these professionals who already deal, in their routine, with the dynamics of cardiopulmonary resuscitation applying BLS, clinical simulation and its preparation stage contribute to the quality of care provided and patient safety, which is an important pedagogical articulation regarding the teaching and learning process in nursing.^{2,4,6-8}

Scientific research^{4-5,7-8} on clinical simulation superficially addresses the preparation stage and its pre-simulation and pre-briefing/briefing phases, which causes conceptual confusion and, consequently, its inadequate use in the teaching and learning process.⁸ This gap is highlighted by the absence of specific scripts in the literature for conducting the preparation stage in clinical simulation, a factor that can negatively affect the development of simulation,⁹ especially on cardiopulmonary resuscitation with BLS. The adoption of valid and adequately structured constructs for this purpose, based on a reliable methodological pathway, is important to promote excellence in the learning of this topic and to achieve the projection of knowledge and clinical reasoning required and essential for the treatment of cardiac arrest.¹⁰

Accordingly, the research question is: What contentes are needed to compose a script for the preparation stage in clinical simulation of BLS in cardiac arrest? This study had the

objective of developing and validating a script to plan and perform the first stage of clinical simulation of BLS in an adult patient in cardiac arrest: the preparation and its pre-simulation and pre-briefing/briefing phases.

Method

This is a methodological study, focused on the process of developing and validating a script for the preparation stage of clinical simulation of an adult patient in cardiac arrest, assisted by means of BLS, conducted in a public university in Ribeirão Preto, São Paulo (SP), from January to August 2020, aimed at nursing students and professionals.

A theoretical and methodological framework was adopted following three sets of procedures: theoretical, empirical, and analytical.¹¹ The theoretical procedure involved identifying the scientific evidence needed to develop the desired script, through a compilation of studies on the preparation stage of clinical simulation, and with support from the 2020 guidelines for cardiopulmonary resuscitation as a theoretical reference for the criteria relating to BLS in the adult.¹²

The empirical procedure involved content validation by experts in clinical simulation in nursing and in BLS, while the analytical procedure consisted in the analysis of the validation results, using the Delphi technique, in order to confirm or refute it.¹¹ Each step was presented sequentially, in order to facilitate the understanding of the follow-up of this study.

In the theoretical procedure stage, an integrative literature review was carried out, with the intent of compiling scientific evidence capable of structuring a theoretical framework regarding the elements that make the preparation stage and its pre-simulation and pre-briefing/briefing phases viable. It was based on the fulfillment of the following phases: identification of the theme and guiding question; search and selection of studies in the literature; categorization; analysis of the selected studies and presentation of the review.¹³

The research question of this review was formulated using the PICO strategy,¹⁴ as follows: What is the scientific evidence available in the literature about the contents needed to compose a script about the preparation stage of clinical simulation, in such a way as to enable the development of competence in nursing students and professionals? The population – “P” was characterized by nursing students and professionals; the intervention – “I” addressed the identification of the elements that make up the pre-simulation and pre-briefing/briefing phases; and the outcome – “O” corresponded to the development of clinical competence in nursing.

The search for the findings was conducted in April 2020, in the following information sources: PubMed, Latin American and Caribbean Literature on Health Sciences (LILACS), Scopus, Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Web of Science, as shown hereinafter in Chart 1.

Chart 1 – Presentation of the information sources, descriptors, keywords and search strategies adopted for the integrative literature review. Ribeirão Preto (SP), Brazil, 2020.

Information source, descriptors and keyword	Search strategy
PubMed® and Scopus MeSH: “Nursing”, “Students”, “Nursing” and “Simulation” Keywords: “ <i>pré-simulação</i> ”, “ <i>pré-briefing</i> ” and “ <i>briefing</i> ”	Crossing P with I – (“ <i>Students, Nursing</i> ” OR “ <i>Pupil Nurses</i> ” OR “ <i>Student, Nursing</i> ” OR “ <i>Nurses, Pupil</i> ” OR “ <i>Nurse, Pupil</i> ” OR “ <i>Pupil Nurse</i> ” OR “ <i>Nursing Student</i> ” OR “ <i>Nursing Students</i> ”) AND (“ <i>Presimulation</i> ” OR “ <i>Briefing</i> ” OR “ <i>Prebriefing</i> ”) – and crossing I with O – (<i>Presimulation</i> OR <i>Briefing</i> OR <i>Prebriefing</i>) AND (“ <i>Clinical Competence</i> ” OR “ <i>Competency, Clinical</i> ” OR “ <i>Competence, Clinical</i> ” OR “ <i>Clinical Competency</i> ” OR “ <i>Clinical Competencies</i> ” OR “ <i>Competencies, Clinical</i> ” OR “ <i>Clinical Skill</i> ” OR “ <i>Skill, Clinical</i> ” OR “ <i>Skills, Clinical</i> ” OR “ <i>Clinical Skills</i> ”)
CINAHL ¹ Titles/Topic: “Students, Nursing” and “Clinical Competence” Keywords: “ <i>Pré-simulation</i> ”, “ <i>Pré-briefing</i> ” and “ <i>Briefing</i> ”	Crossing P with I (“ <i>Students, Nursing</i> ” OR “ <i>Students, Nurse Midwifery</i> ” OR “ <i>Students, Nursing, Associate</i> ”) AND (“ <i>Pré-simulation</i> ” OR “ <i>Briefing</i> ” OR “ <i>Prebriefing</i> ”) and crossing I with O (<i>Pré-simulation</i> OR <i>Briefing</i> OR <i>Pré-briefing</i>) AND (“ <i>Clinical Competence</i> ” OR “ <i>Nursing Skills</i> ” OR “ <i>Cultural Competence</i> ” OR “ <i>National Vocational Qualifications</i> ”)
LILACS ² DeCS ³ : “ <i>Estudantes de Enfermagem</i> ”, “ <i>Equipe de Enfermagem</i> ”, “ <i>Competência, clínica</i> ”	The following search strategies were determined: Crossing P with I – (“ <i>Students, Nursing</i> ” OR “ <i>Estudantes de Enfermería</i> ” OR “ <i>Estudantes de Enfermagem</i> ” AND <i>Pré-simulation</i> OR <i>Pré-simulation</i> OR <i>Pré-simulação</i> OR <i>Pré-briefing</i> OR <i>Briefing</i>) – and crossing I with O – (<i>Pré-</i>

Keywords: “ <i>Pré-simulação</i> ”, “ <i>Pré-briefing</i> ” and “Briefing” (and its English and Spanish versions)	<i>simulation OR Pré-simulation OR Pré-simulação OR Pré-briefing OR Briefing AND “Clinical Competence” OR “Competência Clínica” OR “Competência Clínica”.</i>
<i>Web of Science</i> “Nursing”, “Students, Nursing” and “Simulation” Keywords: “ <i>pré-simulação</i> ”, “ <i>pré-briefing</i> ” and “briefing”	Crossing P with I – (“ <i>Students, Nursing</i> ” OR “ <i>Pupil Nurses</i> ” OR “ <i>Student, Nursing</i> ” OR “ <i>Nurses, Pupil</i> ” OR “ <i>Nurse, Pupil</i> ” OR “ <i>Pupil Nurse</i> ” OR “ <i>Nursing Student</i> ” OR “ <i>Nursing Students</i> ”) AND (“ <i>Presimulation</i> ” OR “ <i>Briefing</i> ” OR “ <i>Prebriefing</i> ”) – and crossing I with O – (<i>Presimulation OR Briefing OR Prebriefing</i>) AND (“ <i>Clinical Competence</i> ” OR “ <i>Competency, Clinical</i> ” OR “ <i>Competence, Clinical</i> ” OR “ <i>Clinical Competency</i> ” OR “ <i>Clinical Competencies</i> ” OR “ <i>Competencies, Clinical</i> ” OR “ <i>Clinical Skill</i> ” OR “ <i>Skill, Clinical</i> ” OR “ <i>Skills, Clinical</i> ” OR “ <i>Clinical Skills</i> ”).

¹MeSH: Medical Subjects Headings; ²CINAHL: Cumulative Index to Nursing and Allied Health Literature; ³LILACS: Latin American and Caribbean Literature on Health Sciences; ⁴DeCS: *Descritores de Ciências da Saúde*.

The Boolean operators represented by the terms *AND* and *OR* were used to combine the descriptors used in the search, *AND* being a restrictive combination and *OR* an additive combination.¹⁴ The keywords “pre-simulation”, “pre-briefing” and “briefing” were used in order to align the search strategy to the intended object.

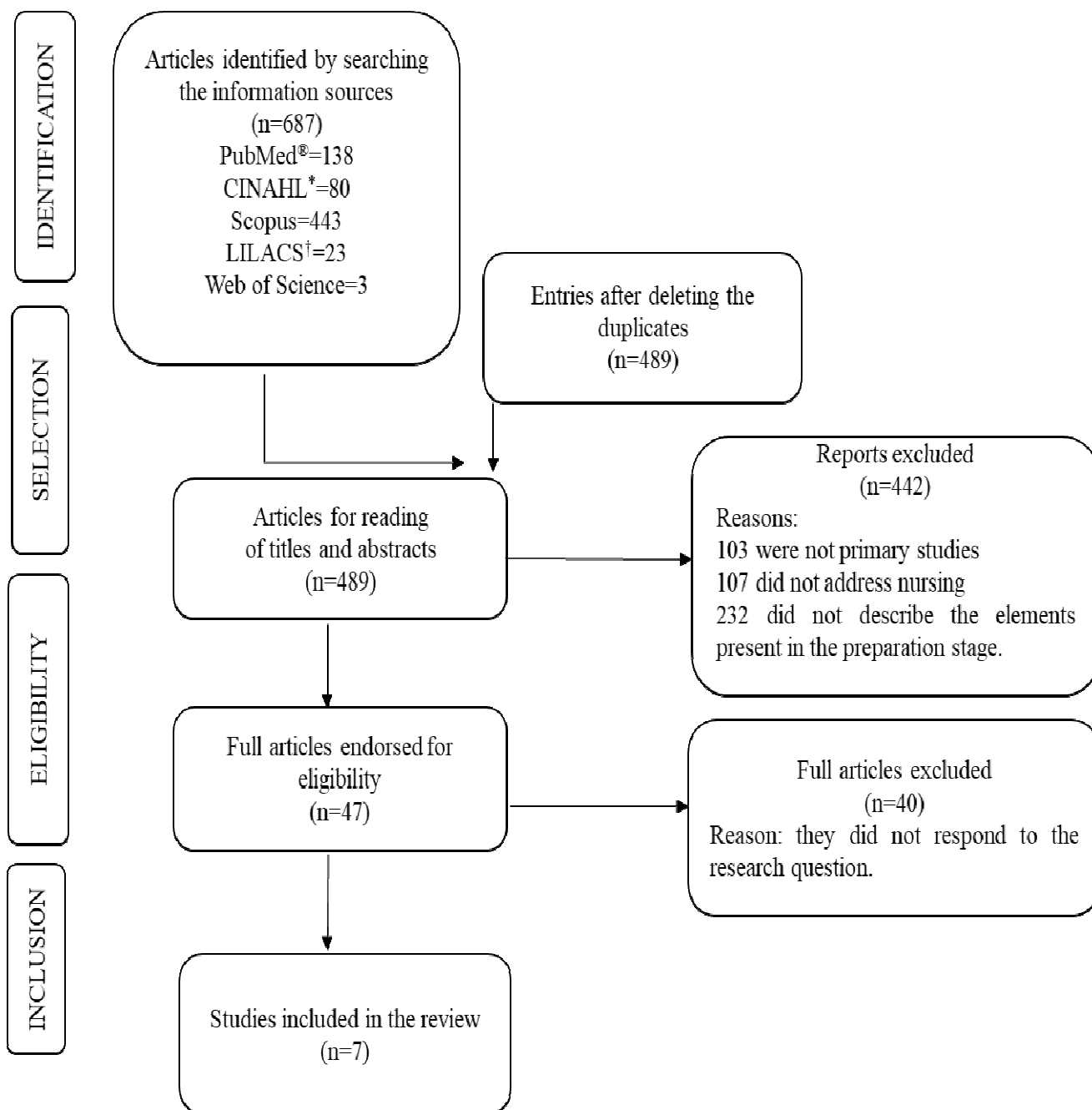
Primary studies published from January 2009 to April 2020 were included. The temporal cut-off is justified by the increase in the use of clinical simulation in nursing in this period and by the advance in scientific research on the simulation phases from 2009^{2,8-9} without language delimitation, published in scientific journals. Literature reviews, editorials, reviews, experience reports, case studies, theoretical reflections, dissertations, theses, monographs and abstracts published in event proceedings were excluded.

A total of three phases of study selection were performed. The first dealt with the evaluation of titles and abstracts, and was performed by two professionals independently, experts in the proposed themes, through a free, single-version web-based review program called Rayyan Qatar Computing Research Institute (Rayyan QCRI). It helps authors of literature reviews to perform their work quickly and allows the exportation of studies from a determined database to the program and the exposure of titles and abstracts, with the blinding of the assistant researcher, which guarantees methodological reliability and accuracy.¹⁵

In the second phase, 15 articles that caused disagreement among researchers were referred to a third party, responsible for making the decision of inclusion or exclusion. In the third phase, the full texts were read and evaluated to define the final sample. For data collection, a previously validated instrument was adapted,¹⁶ prioritizing the following criteria: authors, origin, language and year of publication, objectives, methodological design, results and conclusion. The level of evidence of the studies was also classified.¹⁷

The findings were analyzed using the assumptions of thematic analysis in three stages: pre-analysis, configured by floating reading of the evidence and organization of convergent information, called registration units; subsequently, the exploration of the material with the detailed grouping of the identified registration units; and data treatment, determining the categories.¹⁸ Accordingly, a category was developed called: “elements that make up the pre-simulation and pre-briefing/briefing phases in clinical simulation in nursing”. Based on the obtained assumptions, the intended script was designed. The selection of studies is described in Figure 1.¹⁹

Figure 1 – Flowchart of identification, selection and inclusion of studies, based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) recommendation. Ribeirão Preto (SP), Brazil, 2020.



*CINAHL: Cumulative Index to Nursing and Allied Health Literature; †LILACS: Latin American and Caribbean Literature on Health Sciences.

In the empirical procedures stage, the process of content validation of the script was carried out in June 2020, using the Delphi technique.^{11,20} First, the experts were selected through the analysis of their resumes on the Lattes Platform, applying the following search strategy: in the item on search mode – search by subject – simulation in nursing; in the item on databases – doctors; in the item on academic background/degrees – Doctorate; in the item on professional activity, major area – health sciences and nursing as an area.

The identified resumes were analyzed according to the specific criteria for the calculation of the score, which considers four points for a Doctorate degree with a thesis in the area of interest of the study; three points for a Doctorate degree; three points for a Master degree with a dissertation in the area of interest of the study; two points for a Master degree; two points for the publication of an article in a reference journal in the area of interest of the study; and two points for professional experience of at least 2 years in the area of interest. A minimum value of 5 points was established for the selection of experts in the area of the construct.²¹

The resumes of 29 experts were initially evaluated, since there was the possibility of losses due to non-response. Of these, 20 obtained a higher rating of ten points; however, 16 nursing professionals agreed to participate. These were contacted by the researcher, by e-mail, identified from their own resumes, from websites of institutions where they work, or from published articles. They were sent an explanatory guide about the research, the objectives and the Free and Informed Consent Form.

The data collection instrument was designed from the free electronic tool Google Forms, with a deadline of 30 days for response, being composed of three distinct parts: characterization of the judges/experts; analysis of the items that made up the script, from a Likert-type scale with the options strongly agree (4), agree (3), do not know (0), disagree (2) and strongly disagree (1), with an open space for “comments or suggestions in case of inadequacies”, and general criteria for content evaluation, according to the 12 criteria described in Chart 2.¹¹

Chart 2 – Content Evaluation Requirements. Ribeirão Preto (SP), Brazil, 2020.

Criterion	Requirements
Behavioral	The instrument is applicable, with clear and workable instructions
Objectivity	The recommendations enable the desired goal to be achieved
Simplicity	The items express a single idea and allow for adequate understanding
Clarity	Content is clearly and unambiguously explained
Relevance	The instrument is relevant and meets the proposed purpose
Accuracy	Each item of the instrument is distinct from the others; they do not get mixed up
Variety	The language is adequate and allows interactivity of the content
Modality	The vocabulary is appropriate and unambiguous
Typicality	The vocabulary is consistent with the topic, with appropriate concepts
Credibility	The formulation of the instrument contributes to a favorable attitude toward using and understanding the content
Amplitude	The content is current and consistent, with sufficient depth to understand the theme
Balance	The proposed sequence is presented in a balanced and coherent way

Source: Pasquali.¹¹

In the analytical procedures stage, the findings related to the experts' validation were organized in Microsoft Excel 2010 spreadsheets, with double typing by two different researchers, for registration reliability. The analysis regarding the experts' characterization was held by means of descriptive statistics, frequency, percentage and average. The measures used to evaluate inter-rater agreement were the Content Validity Index (CVI) per item and the total CVI of the instrument.^{11,22}

At first, a Likert-type scale was employed with scores from 1 to 4, which evaluated the relevance/representativeness of the judges' responses, namely: (1) not relevant or not representative (strongly disagree), (2) item needs major revision to be representative (disagree), (3) item needs minor revision to be representative (agree) and (4) item relevant or representative (strongly agree). The response "do not know" was considered as zero value.

The CVI was then evaluated, first per item of the script, using the formula: number of responses 3 or 4/total number of obtained responses.²² Items that received a score of 1 or 2 were reviewed, and the responses marked as "do not know" were eliminated. Next, the total CVI of

the instrument was calculated by adding each CVI value and dividing the result by the number of items that made up the script.²¹ The total CVI of the script was interpreted adopting the following classification: results <0.00 correspond to poor agreement; from 0.00 to 0.20, to mild agreement; from 0.21 to 0.40, to acceptable agreement; from 0.41 to 0.60, to moderate agreement; from 0.61 to 0.80, to considerable agreement; and from 0.81 to 1.00, to almost perfect agreement. For this study, a total CVI of 0.80 was established to indicate that the proposed construct was valid.²³

The judges' suggestions were evaluated as to their relevance, and the script was modified. To this end, the Delphi technique was adopted, characterized by the initial analysis of a questionnaire/instrument by the respondent group and the agreement of its members.²⁰ It is noteworthy that, in the first round of the Delphi technique, the items of the script were considered valid, with agreement >80% and total CVI above the expected (>0.80).²³ Nevertheless, even if the suitability indexes were reached in advance, a second round of the Delphi technique was carried out to provide the required feedback to the judges regarding the requested changes. The research was conducted according to the ethical standards required by resolutions 466/2012, 510/2016 and 580/2018, established by the Brazilian Ministry of Health, and presents the approval protocol number 3.826.306, on February 6th, 2020.

Results

The sample of this integrative review consisted of seven primary studies²⁴⁻³⁰ characterized by international publications dating from 2014 to 2018, with level of evidence 2¹⁷ and of the randomized clinical trial type.

The analysis of the category entitled “elements that make up the pre-simulation and pre-briefing/briefing phases in clinical simulation in nursing” allowed the construction of a script that makes it possible to plan and execute rigorously the first stage of clinical simulation (the preparation) for BLS in the adult, which was divided into two parts. The first addressed the pre-

simulation, while the second addressed the pre-briefing/briefing. Both parts presented the criteria elements, actions, execution time, definition and objectives of the phases; target audience to which the simulation is directed; the learning objectives for BLS; the material resources needed and the procedure, that is, a step-by-step for executing the pre-simulation and pre-briefing phases, to be followed by teachers and facilitators of clinical simulation in nursing.

Of the total of 16 (100%) experts, all were nurses specialized in clinical simulation and cardiopulmonary resuscitation. Most of them were female (68.8%), with an average age of 39 years and an average professional experience in nursing of 17 years. Most (14 judges; 87.5%) had a doctoral degree and worked as teachers in Higher Education, with training in simulation, published articles in this field, and had already participated in events on simulation (15 judges; 93.8%). All judges (16; 100.0%) planned and developed simulations as a teaching and learning strategy in nursing, and mastered the subject of cardiopulmonary resuscitation with BLS. The inter-rater agreement was evident regarding the items that made up the proposed script and the 12 content evaluation criteria¹¹ presented in Table 1.

Table 1 – Distribution of the experts' responses (16), Content Validity Index per item and total Content Validity Index of the script on the preparation stage of clinical simulation in Basic Life Support. Ribeirão Preto (SP), Brazil, 2020.

Script Items	Relevance of the response				Responses 3-4		CVI*
	0 N(%)	1 N(%)	2 N(%)	3 N(%)	4 N(%)	N(%)	
Pre-Simulation phase							
Title			1(6.2)	2(12.5)	13(81.2)	15(93.7)	0.93
Explanation and definition		1(6.2)		2(12.5)	13(81.2)	15(93.7)	0.93
Objectives		1(6.2)		6(37.5)	9(56.2)	15(93.7)	0.93
Material resources	1(6.2)			5(31.2)	10(62.5)	15(93.7)	0.93
Procedure			2(12.5)	4(25)	10(62.5)	14(87.5)	0.87
Time			2(12.5)	5(31.2)	9(56.2)	14(87.5)	0.87
Pre-briefing/briefing stage							
Explanation and definition			1(6.2)	5(31.2)	10(62.5)	15(93.7)	0.93
Objectives			2(12.5)	6(37.5)	8(50.0)	14(87.5)	0.87
Material resources		1(6.2)	1(6.2)	4(25)	10(62.5)	14(87.5)	0.87

Procedure	1(6.2)	1(6.2)	2(12.5)	5(31.2)	7(43.7)	12(75.0)	0.75
Time			2(12.5)	4(25)	10(62.5)	14(87.7)	0.87
References			2(12.5)	2(12.5)	12(75.0)	14(87.5)	0.87
General Evaluation Criteria							
Behavioral: it is applicable and clear			2(12.5)	3(18.75)	11(68.7)	14(87.5)	0.87
Objectivity: it achieves the objective				5(31.2)	11(68.7)	16(100.0)	1.00
Simplicity: it expresses an idea			2(12.5)	5(31.2)	9(56.2)	14(87.5)	0.87
Clarity: the content is clear			2(12.5)	4(25)	10(62.5)	14(87.5)	0.87
Relevance: the script is relevant				7(43.7)	9(56.2)	16 (100.0)	1.00
Accuracy: each item is distinct			2(12.5)	5(31.2)	9(56.2)	14(87.5)	0.87
Variety: the language is appropriate			1(6.2)	6(37.5)	9(56.2)	15(93.7)	0.93
Modality: the vocabulary is appropriate	1(6.2)			7(43.7)	8(50.0)	15(93.7)	0.93
Typicality: the vocabulary is consistent				8(50.0)	8(50.0)	16 (100.0)	1.00
Credibility: it is understandable				8(50.0)	8(50.0)	16 (100.0)	1.00
Amplitude: it is current			1(6.2)	7(43.7)	8(50.0)	15(93.7)	0.93
Balance			2(12.5)	6(37.5)	8(50.0)	14(87.5)	0.87
Total CVI [†]							0.90

[†]CVI: Content Validity Index per item; Total CVI[†]: General Content Validity Index of the script.

As for the inter-rater agreement, analyzed first for each item of the proposed script, all the evaluated criteria were considered as “almost perfect agreement” (0.81 to 1.00), except the tenth item of the script, referring to the pre-briefing/briefing phase, called Procedure and classified as considerable agreement (0.75). Even obtaining a value above 0.80 in most items, those whose evaluation resulted in “disagree” or “strongly disagree” were reviewed.

A value of 0.90 (almost perfect agreement) was obtained for the total CVI of the script, which helped characterize it as a valid construct in its content to conduct the preparation stage in clinical simulation of BLS in the adult. In general, the suggestions, comments and notes made by the experts were evaluated and considered for the construction of the script, enhancing, especially, the following criteria: title, target audience, learning objectives for BLS, required resources, procedure and references.

Accordingly, after validation, the script was composed of 12 contents: (1) title: the script was entitled: “Clinical simulation of Basic Life Support: script for the preparation stage”

(Appendix A); (2) time: the time indicated for planning and execution of the pre-simulation and pre-briefing/briefing stages was established; and (3) references. These three initial items were common to both parts of the script. Subsequently, five contents pertinent to the pre-simulation phase were established: (4) definition of the pre-simulation phase, in order to avoid conceptual confusion between pre-simulation and pre-briefing/briefing and the objectives of the pre-simulation phase; (5) target audience for using the script; (6) learning objectives for BLS; (7) resources needed to plan the pre-simulation; (8) procedure: a step-by-step to execute the pre-simulation phase with practicality, organization, and efficiency. Next, four contents were established for the pre-briefing/briefing phase: (9) definition of this phase and objectives; (10) target audience; (11) resources needed; (12) procedure: a step-by-step to guide the planning and execution of the pre-briefing/briefing.

Discussion

In the various areas of health education, one can notice an increasing number of instruments that seek to evaluate and conduct a phenomenon, which highlights the importance of their validity, in an attempt to minimize subjective judgments.²³ However, regarding clinical simulation in nursing, and especially the planning of its stages, the construction and validation of instruments is incipient.⁷⁻⁹

Based on this fragility of the scientific literature on the topic proposed in this research, it is important to emphasize that the studies that enabled the construction of the script for the preparation stage in clinical simulation of BLS showed a high level of evidence, consisting mostly of randomized clinical trials. An experimental study allows the researcher to identify cause and effect relationships and to control intrinsic and extrinsic variables that may threaten the internal validity of the findings, causing biases that compromise the results.¹⁶ For nursing, underpinning the

construction of instruments on high-quality evidence is a significant aspect, since it provides documentation that allows current practice to be maintained or changed safely and consistently.¹⁷

The adequacy of the proposed script, based on well-founded criteria, is an important step in the development of this construct, since it makes it possible to determine whether its content effectively explores the questions needed to reach its objective.²³ This statement is corroborated by a study that aimed to develop and validate the content of an online questionnaire for evaluating the risk of falls in the elderly population and valued evaluation criteria such as clarity and relevance, which made it possible to consider the instrument valid in its content and suitable for use.²³

The developed script has as its greatest potential the articulation of clinical simulation, as an innovative, active and effective pedagogical strategy for the teaching and learning process in nursing, with the issue of BLS in adults. It also presents as benefits the standardization and organization of the content required for the planning and execution of the preparation stage of clinical simulation, so that it can be adapted for other topics in nursing education, which makes this instrument versatile, useful, and easy to use.

Due to the fact that clinical simulation is an educational strategy on the rise in both the international and national contexts, methodological uncertainties may exist for its conduction, especially regarding the pre-simulation and pre-briefing/briefing phases.⁴⁻⁵ Accordingly, obtaining a validated instrument based on scientific evidence¹⁰ contributes to its construction and provides safety for teaching complex topics such as cardiopulmonary resuscitation.^{6,12,28}

The elements that made up the proposed script, regarding the preparation phases in the BLS clinical simulation, initially highlighted the definition of the phases and their objectives, since it is important that a nursing simulation facilitator obtain a conceptual understanding of the pre-simulation and pre-briefing/briefing, in order to maintain rigor during its execution. Studies that addressed the phases of the preparation stage conceptualized that, while the pre-simulation is a phase that enables the sending of scientific references for the participant's previous study and skills

training, the pre-briefing/briefing configures the clarification regarding the elements that involve and interfere in the simulated scenario and its performance.^{5,7-9}

In the meantime, it is noteworthy that there is currently some confusion about these concepts, for example, the exclusion of the pre-simulation phase and the direct realization of the pre-briefing/briefing in clinical simulation, or even considering them as synonyms. This justifies the need for the script of the preparation stage to contain the definition of its phases and their intentionality, aiming at the correct differentiation and application.^{4-5,9}

After that, the identified elements exposed the importance of pointing out the target audience and the learning objectives for BLS. This script is geared toward the teaching and learning process of professional nurses and undergraduate nursing students, besides establishing a series of learning objectives that should be based on Bloom's taxonomy and the American Heart Association (AHA) guidelines.⁶

Randomized experimental research²⁴ conducted with 38 American nurses examined whether pre-briefing/briefing can develop clinical competence for cardiopulmonary resuscitation and found that rigorous establishment of BLS learning objectives during the preparation stage enabled the tracking of learning outcomes, improved teamwork, individual leadership, as well as quality and speed of cardiopulmonary resuscitation.²⁴

The materials, instruments, and actions that make the preparation stage possible were also valued by the script, and, from this perspective, systematic review studies⁴⁻⁵ underpinned the importance of establishing, especially, the actions pertinent to pre-simulation and pre-briefing/briefing, in the scope of education, since the absence of this element can compromise the learning results of individuals submitted to this teaching strategy.⁴⁻⁵

The main purpose of the validation of the proposed script was to ensure its effectiveness and reliability in the planning and execution of the first stage of clinical simulation, the preparation for BLS, since the adequate execution of the pre-simulation and pre-

briefing/briefing has been associated with reduced stress levels in nursing students during clinical simulation, which maximizes the teaching and learning process and enhances the success of subsequent stages.⁴⁻⁵

The script validation process counted on the critical evaluation of 16 experts in clinical simulation and BLS, in addition to their expertise in the area and the fundamental factor to obtain a valid and adequate construct.²³ This number of judges was also adopted by a validation study,¹⁰ which aimed to develop and validate a questionnaire on adult cardiopulmonary resuscitation in BLS, with the use of the automated external defibrillator, in the hospital environment, resulting in the development of a questionnaire of 20 multiple choice questions with "almost perfect" inter-rater agreement for the addressed topic.¹⁰

The total CVI of the script, of "almost perfect agreement", emphasizes its scientific recognition and criticism in the evaluation of the content, in such a way as to achieve the desired objectives in the teaching-learning process of BLS in adults for nursing.²³

The main limitations were the incipient number of scientific articles addressing the preparation stage in nursing clinical simulation and the absence of studies that proposed to develop and validate scripts to conduct this stage.

This study is relevant and unprecedented in nursing science, since it gathers reliable scientific evidence on the preparation stage of clinical simulation and its pre-simulation and pre-briefing/briefing phases, still little explored in nursing education through clinical simulation. It also offers a scientific product in the form of a script for planning and conducting the initial stage of clinical simulation, which can easily be adapted for various other realities in the teaching and learning process in health care, which makes this construct versatile and useful (Appendix A).

Conclusion

The script was developed from the identification of the contents relevant to the preparation stage of the clinical simulation of BLS in an adult patient, consisting of the title of the script, execution time of each phase, definition and objectives of the pre-simulation and pre-briefing/briefing phases, target audience, BLS learning objectives, material resources, execution procedure and references. The script was considered valid in its content since it reached a Validity Index of 0.90, characterized as “almost perfect agreement”.

This study contributes to research, assistance and teaching in nursing, by presenting a validated and easy-to-use script, which provides and subsidizes the planning and execution of the first stage of a clinical simulation, by facilitators and nursing teachers, before the teaching and learning process of cardiopulmonary resuscitation in adults, based on current and reliable scientific evidence, as well as enabling its adaptation and application for clinical simulation in other teaching topics and for other health professions, which favors the dissemination of science and scientific research in this field.

It is suggested the development of methodologically well-designed studies, which propose to compare the effectiveness of the teaching and learning process, through clinical simulation for BLS, using the script developed in this research.

Appendix A: Clinical simulation of Basic Life Support: script for the preparation stage

Fase de pré-simulação		
Elements	Actions	Time
Definition and objectives of the pre-simulation phase	Definition: “Preparation” is the first stage of clinical simulation, which is subdivided into the pre-simulation and pre-briefing/briefing phases. Pre-simulation addresses the preparation of the participant about the topic proposed for clinical simulation, through didactic materials and skills training. Objectives: (1) Guide the clinical simulation participant in advance and in a planned manner; (2) Favor the development of clinical competence for BLS (cognitive skills-knowledge; psychomotor skills, practical skills and affective skills-attitudes).	The time frame is usually 15 days, which precedes the realization of the simulation scenario; however, it can be extended.

Target audience	Professional nurses and undergraduate nursing students, preferably those who have already had contact with the hospital environment and with the subject of technical bases.	
Learning objectives for Basic Life Support	Developed using Bloom's Taxonomy and the American Heart Association (2015) guidelines for BLS. For the development of cognitive skills (knowledge) and psychomotor skills (practice): (1) To know and understand the in-hospital chain of survival; (2) To analyze the in-hospital chain of survival by articulating it with the experience carried out in the simulated scenario of BLS; (3) To know, understand and synthesize the importance of Surveillance and Prevention, as the first link of the Intra-hospital Chain of Survival; (4) To analyze and evaluate the importance of immediate recognition of cardiac arrest (CRA) and the triggering of the Emergency Medical Service; (5) To Understand and evaluate the characteristics of high-quality Cardiopulmonary Resuscitation (CPR) with BLS: the optimal frequency of external chest compression (ECC); depth of ECC; to allow chest recoil after compression; to minimize interruptions between compressions; optimal hand positioning during compression; to avoid excessive ventilation; compression-ventilation ratio without an advanced airway, correct use of the Automated External Defibrillator (AED). To develop affective skills (attitudes): (1) To be willing and attentive to learn; (2) To participate actively and with satisfaction; (3) To establish commitment to learning; (4) To give value to each learned situation and contextualize it; (5) To transfer experiential learning to actual practice.	
Resources needed	For the previous study about BLS in adults – to send electronically the following didactic materials: (1) Video lesson: Adult CPR in BLS with the use of AED in the hospital setting (https://www.youtube.com/watch?v=MT4DJ5sazik&t=435s); (2) Simulation Video: Adult CPR in BLS using AED in the hospital setting (https://www.youtube.com/watch?v=xvmOepMeQd4&t=62s); (3) Material entitled "Highlights from the American Heart Association 2015 – CPR and ECC Guidelines Update – Summarized in Portuguese (https://eccguidelines.heart.org/wp-content/uploads/2015/10/2015-AHA-Guidelines-Highlights-Portuguese.pdf). For the training on BLS psychomotor skills, in a clinical skills laboratory, or in an <i>in situ</i> environment, please organize: (1) Permanent materials: mannequin of the torso-type, mannequin of medium-fidelity with feedback for frequency and depth of external chest compressions, television screen, in order to capture image of the software through bluetooth, high-fidelity mannequin; emergency cart; stepladder; bag-valve-mask unit; protective goggles; gas ruler complete with attached devices, such as oxygen humidifier, containing distilled water at the minimum estimated level; aspiration system with vial; AED for training; hospital stretcher and hospital bed; (2) Consumable materials: procedure gloves (S, M and L) and surgical-type face masks.	15 days prior to the proposed clinical simulation activity Preferably, perform on the same day as the clinical simulation scenario, before the scenario
Procedure	For the previous study about BLS in adults (1) To determine the list of participants and the e-mail addresses to which the teaching materials selected for study will be sent; (2) To send, together with the study materials determined,	15 days prior to the proposed activity

	<p>a presentation about clinical simulation of BLS in the adult. This should be a proposal that addresses the intended learning objectives, the clinical simulation stages that will be performed, the clinical simulation facilitators who will be present (mini-resume), the importance of the preparation stage and how to proceed with it, as well as the dates, times, location, duration and organization of the clinical simulation to which the participant will be submitted;</p> <p>For the training on BLS psychomotor skills: (1) Skills training will be carried out in groups of five participants, given the maximization of the teaching and learning process in a small number of people, due to the possibility of better monitoring, more attention and better evaluation; (2) To organize in advance the skills laboratory of the institution where the clinical simulation will occur, with a torso-type mannequin for every three participants; (3) To receive participants in the skills laboratory, introduce the facilitators or instructors team of the proposed simulation and provide appropriate guidance on how the skills training will occur and its importance; (4) To start the training by demonstrating a video lesson about BLS, and at each visualized stage of the BLS clinical care using AED, stop the exposure of the video, demonstrate it on the torso-type mannequin on the floor and propose the execution by the participants themselves; (5) Afterwards, perform the BLS procedure using the medium-fidelity mannequin, on the bed or on the hospital stretcher, with feedback for the frequency and depth of external chest compressions and a television screen to capture the software image through bluetooth.</p>	<p>During the execution of the proposed activity</p>
Pre-briefing/ briefing phases		
<p>Definition and objectives of the pre-briefing/ briefing phases</p>	<p>Definition: the pre-briefing/briefing is the phase that involves organizing and clarifying the participants regarding the environment and the proposed simulation scenario. Objectives: (1) To offer the preparatory information for the execution of simulation, such as the objectives of the scenario, the roles to be played by the research participants and the overview of the available equipment; (2) To share knowledge, reduce confusion about the participants' roles and help create a mental model regarding the goals of patient care; (3) To provide orientation regarding the simulated environment, laboratory and mannequins; their operation; objectives of the scenario; report or history of information on the customer's clinical picture and specific roles and responsibilities of team members; (4) To obtain better teamwork and organized performance in clinical simulation.</p>	<p>It immediately precedes the clinical simulation scenario</p>
<p>Target audience</p>	<p>Professional nurses and undergraduate nursing students, preferably those who have already had contact with the hospital environment and with the subject of technical bases.</p>	
<p>Resources needed</p>	<p>In the clinical skills laboratory or <i>in situ</i> environment, please organize the materials required for the execution of the scenario entitled: "Cardiopulmonary resuscitation in the adult in a hospital environment, with Basic Life Support and use of the automated external defibrillator":</p> <p>(1) Permanent materials: use high-fidelity mannequin; emergency cart; stepladder; bag-valve-mask unit; goggles; gas ruler complete with attached</p>	

	devices such as oxygen humidifier, containing distilled water at the minimum estimated level; aspiration system with vial; AED for training; hospital bed; cardiac monitor; pulse oximeter; electrodes for cardiac monitoring; sheet and pillow; (2) Consumable materials: procedure gloves (S, M and L) and surgical-type face masks. Actors are not required to execute this scenario, only the participants involved in the clinical simulation.	
Procedure	<p>1. Firstly, one should establish the “fiction contract” of the clinical simulation, which: (1) Regulates the commitment of the clinical simulation facilitators and participants to the psychological safety of the participants and confidentiality of all activities and occurrences during the simulation; (2) Clarifies who will guide and monitor the participants’ performance, and that this is not a punitive evaluation; (3) Establishes the participant’s commitment to do his/her part and act as if everything was real, to get the most out of this experience; (4) Clarifies that each participant will have a previously communicated and clarified role during the execution of the scenario; (5) Informs that the Objective Structured Clinical Examination (OSCE) will be used to record the performance of each participant during the execution of BLS and that, therefore, the scene will be repeated, until all participants perform all the roles addressed by this instrument; (6) Explains that, after the end of the scenario, there will be the debriefing, which should last “twice as long”, being used for the execution of the scenario, conducted by the simulation facilitators for reflection on the experience. Please provide guidance on: (7) Learning environment: to demonstrate the location of all materials used during the scene, the mannequin and equipment; (8) Learning objectives (previously arranged); (9) Presentation of the following clinical case: “This is a 50-year-old patient, Mr. Alfredo, admitted to bed 203 of the ward of a hospital, with a history of vomiting, epigastric and precordial pain, irradiation to the posterior thoracic region, besides a medical diagnosis of acute myocardial infarction. He shows no responses and reactions in bed. When performing the bedside visit for the nursing evaluation of Mr. Alfredo, the nurse notices a decrease/absence of reaction and perception”; (10) To define the role of each participant in the scene: the scene will have the presence of a maximum of five participants; (11) Roles: First participant (leader): he/she will start the scene with a visit to the bedside, will approach the patient in question, will notice the absence of reactivity and will call the other participants to the scene, dividing their roles; Second participant: he/she will take over chest compressions; Third participant: he/she will take over bag-valve-mask ventilation; Fourth participant: he/she will take over AED; Fifth participant: he/she will take over the replacement of external chest compressions.</p> <p>Duration of the scenario: the scenario will be interrupted for role-switching after the return of spontaneous circulation, after the first shock, and will end after all participants have played all the roles; Please allow the participants a few minutes before the scenario starts to process and pass on the obtained information.</p>	<p>It immediately precedes the simulation scenario, lasting 10 minutes</p> <p>Scenario lasting between 20 and 30 minutes</p>
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Corresponding author

Juliana da Silva Garcia Nascimento

E-mail: mestradounesp28@yahoo.com.br

Address: Osório Joaquim Guimarães Street, nº 281. Ap. 203, Block 05. Parque São Geraldo Neighborhood. Uberaba - Minas Gerais. Zip Code: 38030130

Authorship Contributions

1 – Juliana da Silva Garcia Nascimento

Conception or design of the study/research, analysis and/or interpretation of the data, final review with critical and intellectual participation in the manuscript.

2 – Kleiton Gonçalves do Nascimento

Conception or design of the study/research, analysis and / or interpretation of the data, final review with critical and intellectual participation in the manuscript.

3 – Daniela da Silva Garcia Regino

Conception or design of the study/research, analysis and/or interpretation of the data.

4 – Mateus Goulart Alves

Conception or design of the study/research, analysis and/or interpretation of the data.

5 – Jordana Luiza Gouvêa de Oliveira

Conception or design of the study/research, analysis and/or interpretation of the data.

6 – Maria Celia Barcellos Dalri

Conception or design of the study/research, final review with critical and intellectual participation in the manuscript.

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