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carlos.lyra@unirio.br  
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Pereira, Jessica França; Silva, Renata Flavia Abreu da; Corrêa, Vanessa de Almeida Ferreira  
Guiding instrument analysis: contributions to realistic simulation in healthcare

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ORIGINAL ARTICLE

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## GUIDING INSTRUMENT ANALYSIS: CONTRIBUTIONS TO REALÍSTICA SIMULATION IN HEALTHCARE

*Análise de instrumento orientador: contribuições para a simulação realística em saúde*

*Análisis de instrumentos retores: contribuciones a la simulación realista en salud*

Jessica França Pereira<sup>1</sup> 

Renata Flavia Abreu da Silva<sup>2</sup> 

Vanessa de Almeida Ferreira Corrêa<sup>3</sup> 

### ABSTRACT

**Objective:** to analyze a guiding instrument for Realistic Simulation in Health used by a Higher Education Institution. **Method:** this was a descriptive, qualitative study involving 23 professionals with a degree in healthcare and experience in realistic simulation. Data was collected via an online questionnaire between March and June 2020. Thematic-categorical content analysis was used. **Results:** the instrument covers the necessary steps for day-to-day simulation teaching. The category "Essential items for planning the simulation" includes: preparing the simulated scenario; the role of teachers/facilitators in briefing and developing the simulated scenario; the role of teachers/facilitators in debriefing; and evaluating the simulation. **Conclusion:** the development of this research enabled the dimensions of Isimula to be adapted, favoring clarity in the stages necessary for simulation and helping to support teachers/facilitators in the planning, development and evaluation of simulation in different healthcare contexts.

**DESCRIPTORS:** Simulation exercise; Nursing education; Higher education institutions;

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<sup>1,2,3</sup> Federal University of the State of Rio de Janeiro, Rio de Janeiro, Rio de Janeiro, Brazil.

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**Corresponding Author:** Jessica França Pereira [jessica.france.p@gmail.com](mailto:jessica.france.p@gmail.com)

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## RESUMO

**Objetivo:** analisar um instrumento orientador para a Simulação Realística em Saúde utilizado por uma Instituição de Ensino Superior. **Método:** estudo descritivo, qualitativo com participação de 23 profissionais com Graduação na área da saúde e experiência em simulação realística. A coleta de dados, via questionário on-line, ocorreu no período de março a junho de 2020. Utilizou-se a análise de conteúdo temático-categorial. **Resultados:** o instrumento contempla as etapas necessárias para o cotidiano do ensino em simulação. A categoria "Itens imprescindíveis para o planejamento da simulação" engloba: preparo do cenário simulado; atuação dos docentes/facilitadores no briefing e no desenvolvimento do cenário simulado; atuação dos docentes/facilitadores no debriefing; e avaliação da simulação. **Conclusão:** o desenvolvimento desta pesquisa possibilitou adequação das dimensões do Isimula favorecendo clareza às etapas necessárias à simulação e contribui para apoiar docentes/facilitadores no planejamento, desenvolvimento e avaliação da simulação, em diferentes contextos de atenção à saúde.

**DESCRITORES:** Exercício de simulação; Educação em enfermagem; Instituições de ensino superior;

## RESUMEN

**Objetivos:** to analyze a guiding instrument for Realistic Simulation in Health used by a Higher Education Institution. **Method:** this was a descriptive, qualitative study involving 23 professionals with a degree in healthcare and experience in realistic simulation. Data was collected via an online questionnaire between March and June 2020. Thematic-categorical content analysis was used. **Results:** the instrument covers the necessary steps for day-to-day simulation teaching. The category "Essential items for planning the simulation" includes: preparing the simulated scenario; the role of teachers/facilitators in briefing and developing the simulated scenario; the role of teachers/facilitators in debriefing; and evaluating the simulation. **Conclusion:** the development of this research enabled the dimensions of Isimula to be adapted, favoring clarity in the stages necessary for simulation and helping to support teachers/facilitators in the planning, development and evaluation of simulation in different healthcare contexts.

**DESCRIPTORES:** Simulation exercise; Nursing education; Higher education institutions.

## INTRODUCTION

Realistic simulation is a methodology that has been developed since the 18th century, when the first experience close to it was created, and has been exploited mainly by the aerospace industry.<sup>1</sup> In Higher Education Institutions in the area of Health (HEIs), Realistic Simulation in Health (RSH) gained notoriety when it was implemented with the aim of improving the results presented in the "To err is human" report, which indicated alarming data in relation to the number of deaths related to health care,<sup>2</sup> with the aim of providing teaching experiences aimed at applying theoretical knowledge in practice.<sup>3</sup>

However, its use by HEIs teachers is still met with resistance, with challenges such as: lack of skills and knowledge on the subject; lack of time to plan new scenarios; distance from care practice; and lack of knowledge about new technologies.<sup>4</sup> Despite the challenges, the use of RSH has been growing.<sup>2</sup>

RSH is characterized by the stages of planning with the definition of objectives, structure, simulation format, case description and realism; pre-briefing or briefing; debriefing; and evaluation,<sup>2</sup> and it is important to incorporate these stages in a structured way for it to be effective<sup>3,5</sup> and to differentiate it from other teaching methodologies, such as role-playing and demonstration. The first stage in the development of RSH is the construction of the simulated scenario.<sup>6</sup> It should be noted that the National League Nursing/Jeffries Simulation

Theory is one of the most widely used simulation models in nursing.<sup>7</sup>

In addition to the recommendations of the Jeffries model,<sup>7,8</sup> another international standard for RSH are the guidelines of The International Nursing Association for Clinical Simulation and Learning (INACSL), which published "The INACSL Standards of Best Practice: Simulation" with the aim of encouraging evidence-based simulated practices. In the recommendations for simulation design, the guidelines indicate 11 criteria to be followed: assessment of the need to use simulation; measurable objectives; structuring based on the purpose, theory and modality of simulation; construction of the simulated scenario; use of various types of fidelity; facilitative approach; start from pre-briefing; debriefing/feedback; evaluation of participants and simulation team; provision of material resources; and pilot testing.<sup>5</sup>

Despite the use of these references<sup>5,7,8</sup> for structuring RSH in simulation laboratories, the international guidelines need to be adapted to HEIs, considering the Brazilian reality and the stimulus needed to develop simulation. Thus, its development is still being discussed by experts in the field, and further research is indicated.<sup>3</sup>

In the use of RSH, the facilitator, who may or may not be a teacher, has the role of helping participants develop their skills, critical thinking, problem-solving ability, clinical judgment and the application of theoretical knowledge in practice.<sup>5</sup> Despite the knowledge of RSH to perform this role,<sup>2-5</sup> studies point to a lack of knowledge on the part of teachers,<sup>4</sup> which

can affect the involvement of participants and reduce their chances of achieving the expected objectives.<sup>5</sup>

At the HEIs where the authors of this study work, RSH has been used as a teaching strategy since 2015 in the Undergraduate and Postgraduate Nursing Courses in a multimodal laboratory, where research, extension and teaching activities take place; and different care production scenarios are considered, in addition to the hospital care context. Given the need to promote RSH, it was decided to improve the simulated scenario model used for an instrument that would enable teaching guidance from the preparation of the simulated scenario to the development and evaluation of RSH, based on the guidelines proposed by Jeffries<sup>7,8</sup> and INACSL.<sup>5</sup>

The proposal for the new instrument is based on a literature review, refresher courses and teaching experience in developing RSH. It is presented in the chronological order of the simulation stages and is justified by the need to alert teachers/facilitators to the organization required to develop all the RSH stages.

The aim of this research is to analyze a guiding instrument for Realistic Simulation in Health used by a Higher Education Institution.

## METHOD

A descriptive study with a qualitative approach, whose data collection took place via an online questionnaire between March and June 2020, sent by professional email to a total of 63 potential participants, obtained 23 responses to the questionnaire. The questionnaire was made up of questions about the suitability of the items in the instrument, doubts and suggestions.

Snowball sampling was used to invite participants.<sup>9</sup> Key informants were nominated by teachers at an undergraduate nursing course located in Rio de Janeiro (RJ), Brazil, and the following inclusion criteria were considered: undergraduate degree in the health area; and at least six months' experience in RSH. In addition, participants were selected from research groups in the broad area of Health Sciences through the Lattes Platform, using the keywords "realistic simulation" and "simulation in health"; and their Lattes CVs were analyzed.

Thematic-categorical content analysis<sup>10</sup> was used to analyze the participants' answers and 297 Registration Units (RU) made up of phrases were selected. The RUs belonging to the same thematic unit were then grouped into 46 Meaning Units (MU). Finally, these USs were divided into 5 thematic categories. The category "Essential items for RSH planning" was identified as fundamental to answering the aim of this article. It should be noted that in questionnaire no. 18, the participants' contributions began to repeat themselves, and data saturation was considered.

This research, approved by the Research Ethics Committee of the proposing institution, under opinion: 3.926.805, is in accordance with the determinations of the National Health Council, through Resolution No. 466/2012. The questionnaires were given ordinal numbers to guarantee the anonymity of the participants.

## RESULTS

Of the 23 participants, all had a degree in nursing. The average age was 40. With regard to professional training, 22 professionals said they had completed a postgraduate course. Of these, 21 had a specialization degree, 22 had a master's degree, 16 said they had a doctorate and three had completed a post-doctorate. The average length of experience in RSH was 6.5 years, with a minimum of 8 months and a maximum of 25 years. It should be noted that 22 of the 23 participants had taken part in some kind of continuing education on RSH.

When answering about the suitability of the items in the RSH guidance tool, the analysis of the questionnaires showed that nine participants agreed that the tool was suitable for planning RSH (they answered yes to all four dimensions), but 14 of the participants had doubts about at least one of the dimensions. As shown in the table below:

**Table 1** - Participants' answers regarding Isimula analysis (n = 23). Rio de Janeiro, RJ, Brazil, 2021

Questions	Yes	No	Partially
Instrument is suitable for RSH planning	09	00	14
<b>I - Planning the Simulated Scenario</b>			
The items include the planning of the simulated scenario	20	01	02
Doubts	09	14	-
<b>II - Development of the Simulated Scenario</b>			
The items include planning the development of the simulated scenario	14	03	06
Doubts	08	15	-
<b>III - Debriefing</b>			
The items include the planning of the Debriefing	19	02	02
Doubts	09	15	-
<b>IV - Evaluation</b>			
The items cover Evaluation planning	16	01	06
Doubts	02	21	-

The data presented indicates the potential of the RSH guidance instrument for developing this methodology. It can be inferred that the greater number of "yes" answers in all dimensions for the item "contemplates planning a simulated scenario" suggests that the instrument under analysis can be used in everyday RSH teaching practices.

However, doubts and suggestions regarding the instrument in question were identified and analyzed using thematic-categorical content analysis and the category "Essential items for RSH planning" was constructed. This is made up of 20 RUs, based on the selection of 158 RUs, comprising 53.2% of the total number of units selected.

This category includes: preparation of the simulated scenario; the role of the teachers/facilitators in the briefing and development of the simulated scenario; the role of the teachers/facilitators in the debriefing; and evaluation in the RSH, as shown in the table

below, based on the examples of the RUs selected and the necessary modifications identified by the authors during the analysis.

As a result of the analysis, the final proposal for the tool was reorganized, presenting guidelines for each stage required to develop the RSH. The richness of detail for teaching purposes advances the synthesis of guidelines and practicality in relation to previously published instruments, with the aim of supporting teachers/facilitators in the development of simulated scenarios; the development and evaluation of RSH, as well as the recording of teaching-learning processes based on simulation.

This tool was called "Isimula" by the authors, and refers to the "I" as the "beginning" to indicate the organization required for RSH. In addition, the letter "I" in "Isimula" is associated with names used in mobile application logos, which refer to technology. The word that complements the acronym "simula" refers to the didactic strategy and also complements the idea of practice in simulating.

**Chart 1** - Category entitled "Essential items for RSH planning" by MU, corresponding selection of RUs and necessary modifications to the instrument. Rio de Janeiro, RJ, Brazil, 2021

<b>Essential items for RSH planning</b>	
<b>Examples of RUs</b>	<b>Modifications needed to the items in the initial instrument</b>
<b>MU: Preparing the simulated scenario and the teachers/facilitators' role in the briefing</b>	
<p>Add [...] the number of students taking part in the simulation. (Q9)</p> <p>In the location item, I don't think I understand whether you're referring to the location to be represented or the location where the scenario will take place. (Q13)</p> <p>I suggest inserting Material Resources for the scenario in item 2.1, including the provision of low, medium and high fidelity mannequins. (Q17)</p> <p>Specify the characterization of the actors (clothes, prostheses, physical characteristics). (Q18)</p> <p>It would be important to highlight what minimum skill you need to achieve the objective. (Q3)</p> <p>Replace 'actor' with 'standardized patient', this is the current and most appropriate nomenclature. (Q12)</p> <p>Rewrite the definition of "Critical Points" and "Turning Points", as it is not clear. (Q4)</p>	<p>Redefining the dimensions of Isimula between "Preparing the simulated scenario" and "Facilitator's role in the briefing"</p> <p>Reallocation of the essential items for preparing the simulated scenario</p> <p>Updating the definition of "Critical Points" and "Turning Points"</p> <p>Use of the terminology patient/user/person/family/professional</p>
<b>MU: Performance of teachers/facilitators in the development of the simulated scenario</b>	
<p>Feedback not clear. (Q2)</p>	<p>Definition of the term feedback</p>
<b>MU: Performance of teachers/facilitators in debriefing</b>	

An introduction explaining that the debriefing is expected to follow these steps. (Q1)  
I suggest you use a guiding framework for the structured debriefing. (Q21)

Definition of the guiding framework for the structured debriefing: PEARLS model

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### MU: Evaluation at RSH

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Only one questionnaire was presented for evaluation. There are many others in the literature, I suggest using them to improve the scenario over time. (Q22)

Suggestion of RSH assessment instruments validated in Portuguese/Brazil.

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## DISCUSSION

The proposal to build theoretical-practical roadmaps<sup>3</sup> and recommendations with the intention of guaranteeing the use of realistic simulation based on scientific evidence<sup>5</sup> has been the concern of researchers regarding the challenge of teaching aimed at experiencing safe care,<sup>2</sup> before meeting the user at the different points of health care. This challenge is in line with scientific studies which have identified: teachers' insecurity in developing RSH; a lack of material and human resources; and difficulty in planning the methodology in question.<sup>2,4</sup> In this study, the length of professional experience in RSH, with an average of 6.5 years, demonstrates the experience of the participants and indicates the development of the methodology in question.

The original concern of the authors of this study refers to the need to enhance RSH in HEIs, based on scientific evidence and international guidelines;<sup>5,7,8</sup> and the commitment to RSH planning as a start for the development of quality and safe simulated scenarios.

In this sense, the category "Essential items for RSH planning" pointed to the need to reorganize the instrument under analysis. Thus, the dimensions that make up Isimula were reorganized and named, based on the analysis: Dimension I: Preparing the simulated scenario; Dimension II: The teacher/facilitator's role in the briefing; Dimension III: The teacher/facilitator's role in developing the simulated scenario; Dimension IV: The teacher/facilitator's role in the debriefing; Dimension V: Performance of the teacher/facilitator in the RSH Evaluation.

The changes in the final Isimula proposal refer to the redefinition of the first dimension. The previous designation of this dimension as "RSH planning" was divided into two dimensions: the first, "Preparing the Simulated Scenario", as proposed in the scientific literature<sup>3</sup>, and the creation of the second dimension, "The role of the teacher/facilitator in the Briefing".<sup>5,12</sup> Data analysis revealed that the "RSH planning" dimension encompassed two important moments for RSH quality: preparing the simulated scenario and the role of the teacher/facilitator in the briefing. In this sense, it was obser-

ved that Isimula contributes to both the preparation of the simulated scenario and provides guidance for the teacher/facilitator when acting in the briefing.

Regarding the preparation of the simulated scenario, the research participants' concern with the reliability and complexity of the scenario stands out. During the analysis, it was identified that the participants' doubts were related to the lack of the following items: characterization of the simulated patient and definition of the number of participants. These items were described in the instrument under analysis when the scenario was presented to the RSH participants.

Thus, we identified the importance of presenting these items in the dimension related to preparing the simulated scenario. It is at this stage that the teacher/facilitator describes the characteristics of the scenario so that the students can relate as closely as possible to reality. These items are also present in the study carried out by Negri et al.<sup>6</sup> regarding the importance of the number of participants and the relevance of the characterization of the simulated patient for the realism of the scenario.<sup>6</sup>

The creation of the second dimension called "Teacher/facilitator performance in the Briefing" is intended to guide teachers/facilitators in the presentation of the simulated scenario to participants as a stage of RSH, which is important for the development of the simulated scenario, not always valued in the implementation of RSH and in studies.<sup>11</sup> It should be noted that RSH requires the preparation of the simulated scenario, so that at the time of the briefing, the ideas, descriptions of the scenario and materials are organized in such a way that the participants in the realistic simulation receive the information they need to experience the simulated scenario.

Attention is drawn to the INACSL recommendations<sup>5</sup> (2016) regarding the actions to be taken by the RSH teacher/facilitator in the briefing. At this stage, the facilitator will provide guidance on the general/specific objectives, the space, the equipment available, the patient's situation, the duration, the roles to be played by the participants and the evaluation method.<sup>5</sup> Thus, the aim of the briefing is to set up a contract of activities with the aim of establishing a psychologically

safe environment for the participants, reducing anxiety, immediately before the scenario.<sup>5,12</sup>

Another issue raised by participants in the Isimula analysis was the need to update the definition of "Critical Points" and "Turning Points", which were understood as support tips for participants in the simulated scenario. It should be noted that in 2007, author Jeffries updated the term "tips" to "student support", considering that this term adds information that can be provided through standardized participant statements or lack thereof.<sup>13</sup> Thus, the item related to "student support" should present, through the description of verbal statements or non-verbal actions, information necessary for the simulation participant with the intention of helping them interpret the simulated reality and achieve the expected results.<sup>5,13</sup>

In this sense, the information contained in Isimula's "student support" will provide guidance to teachers/facilitators on the need for: description of verbal speech and non-verbal actions; presentation of the physiological conditions, pre-programmed for the simulator or standardized patient; in addition to the display of clues classified as: predetermined, anticipating the actions of the participants,<sup>5</sup> with their development indicated by means of a decision tree.

The analysis of the questionnaires also showed the importance of defining the terms related to the participants in the simulated scenario. This need is present in the report on good simulation practices<sup>5</sup> when it refers to the definition of standardized/simulated patient. In the scientific literature, there is a variety of terminology for identifying the participants in the simulated scenario as trained actors who take on the role of patient in the simulation: "standardized patient"<sup>14</sup> and "simulated patients".<sup>6</sup> The INACSL defines the two terms as synonyms to name the actors who participate as patients during the simulated scenario.<sup>5</sup>

In this context, the need to include the terminology of standardized patient/user/person/family/professional in Isimula is highlighted, as it is a reality at HEIs, and the concern to produce a guiding instrument for RSH that can dialogue with the construction of simulated scenarios aimed at the different fields of care and subjects involved in the production of healthcare.

Another item that required reflection during the analysis of the questionnaires was the term feedback. This is characterized as unilateral communication about the participants' behaviour or performance, and is considered to be different from debriefing.<sup>15</sup> In the authors' experience, this is an opportunity to welcome the participants in the scenario, and it is important to develop it soon after the end of the scenario. This strategy is due to the fact that RSH is part of courses with a large number of students, and it is not possible to carry out the debriefing in the laboratory of the institution in question in some simulations. Thus, when considering the time needed for the debriefing to begin, there is a concern about welcoming and unilateral communication with the participants in the simulated scenario.

As for the dimension related to debriefing, the participants' contributions highlighted the need to use structured debriefing. This is a stage of the simulation in which there are reflections on the experience lived in the scenario and significant learning, guided by the facilitator, with the aim of reflecting on the functions of the cognitive processes, psychomotor skills and emotional states of the students, according to a model that underpins it.<sup>16</sup>

The authors of this study chose structured debriefing, based on the PEARLS model,<sup>17</sup> because it is the closest to the practices already developed at the institution. This consists of structuring the debriefing into four phases: reactions, description, analysis and summary phase. In the first phase, called "reactions", the facilitator asks open-ended questions such as "How are you feeling?" so that students can express their initial thoughts and feelings. In the "description" phase, the trainer encourages participants to summarize the main challenges and problems identified. This phase will ensure that the facilitator and the simulation participants share their ideas.<sup>17</sup>

Then, in the third phase, called "analysis", the facilitator chooses a strategy based on the results identified earlier, with the aim of providing "solutions" to the problems experienced. Finally, in the "summary" phase, the instructor asks the student to explain the learning acquired from the simulated activity, providing debriefing in line with the participants' experiences and the proposed objectives.<sup>17</sup>

With regard to the analysis of Dimension V of Isimula, entitled: "The role of the teacher/facilitator in assessment", we identified the study participants' proposal to offer validated assessment instruments in Portuguese/Brazil (BR). These instruments are essential for recognizing learning gaps, carefully observing actions and guiding teachers' decisions.<sup>18</sup>

In this way, assessment is proposed in this study as Dimension V of Isimula, as we understand the importance of assessment for the quality of the teaching-learning process focused on RSH. It should be noted that, according to good practice in simulation, assessment is not considered to be a stage of RSH.<sup>5</sup> However, assessment has been identified as important for the qualification and monitoring of teaching practices in the simulation laboratory.

In this respect, it is hoped that Isimula,<sup>19</sup> based on an analysis of the participants' responses, will enhance the use of RSH. The instrument's contribution lies in providing guidance on RSH and systematizing simulation, differentiating it from other active methodologies. As well as supporting teachers/facilitators in planning teaching time, acting during the simulation and supporting future research aimed at monitoring and evaluating the methodology in question.

## CONCLUSION

The analysis of the responses from the participants in this research enabled the reorganization of the Isimula dimensions, favoring clarity and delimitation of the stages necessary for

RSH; and will contribute to supporting teachers/facilitators in the planning, development and evaluation of RSH in different healthcare contexts. The development of this research made it possible to identify the importance of instruments that synthesize the scientific evidence in the literature regarding the stages of RSH, in order to guide the practice of teachers/facilitators in RSH.

This tool allows teachers to insert information on the essential items for preparing the simulated scenario and proposals for validated assessment tools in Portuguese; it also provides guidance for teachers on the practices needed during briefing, development and debriefing to offer a safe, quality teaching-learning strategy for students.

The limitation of the research is that it is not suitable for methodological research, content validation and the appearance of instruments. It is understood that Isimula should undergo periodic revisions in order to make it up-to-date for use in different HEIs.

It is suggested that new research be carried out to validate its appearance and content, with the participation of teachers and students involved in RSH.

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