Validation of a technical product to evaluate clinical skills of nursing students in realistic simulation in pre-hospital care

ABSTRACT
Objective: To validate an instrument for assessing the skills, abilities, and attitudes of nursing students during the practice of realistic simulation in pre-hospital care. Methodology: Methodological study carried out through the Delphi Method at a Private Faculty in Recife from March to June 2019. Eleven teachers participated in the content validation using the Likert Scale, through the application of a self-responsive form with 21 items. Data analysis was performed using the Content Validation Index and Cronbach's Alpha. Results: The content validation had scores of 0.8 indicating high validity of the instrument regarding questions of realistic simulation in pre-hospital care. The instrument's reliability obtained a value of 0.79 assessed as substantial, considering the reliability classification table of Cronbach's alpha. Conclusion: The technical product called “Form for evaluating knowledge, skills and attitudes in pre-hospital care in Realistic Simulation” was validated, with 21 items evaluated with satisfactory Content Validity and Cronbach's Indexes.

DESCRIPTORS: Nursing Evaluation; Patient Simulation; Simulation Training.

RESUMEN
Objetivo: Validar un instrumento para evaluar las habilidades, habilidades y actitudes de estudiantes de enfermería durante la práctica de simulación realista en la atención prehospitalaria. Metodología: Estudio metodológico realizado mediante el Método Delphi en una Facultad Privada de Recife de marzo a junio de 2019. Once profesores participaron en la validación de contenido mediante la Escala Likert, mediante la aplicación de un formulario de respuesta propia con 21 ítems. El análisis de los datos se realizó mediante el Índice de Validación de Contenido y el Alfa de Cronbach. Resultados: La validación de contenido obtuvo puntuaciones de 0,8 indicando alta validez del instrumento en cuestiones de simulación realista en la atención prehospitalaria. La confiabilidad del instrumento obtuvo un valor de 0,79 evaluado como sustancial, considerando la tabla de clasificación de confiabilidad del alfa de Cronbach. Conclusión: Se validó el producto técnico denominado “Formulario para la evaluación de conocimientos, habilidades y actitudes en la atención prehospitalaria en Simulación Realista”, con 21 ítems evaluados con Validez de Contenido e Índices de Cronbach satisfactorios.

DESCRIPTORES: Evaluación de Enfermería; Simulación de Pacientes; Entrenamiento de Simulación.

RESUMO

DESCRITORES: Avaliação em Enfermagem; Simulação de Paciente; Treinamento por Simulação.
INTRODUCTION

Considering the aspects of the contemporary world of work and the adequacy of new types of assistance in the health sector in Brazil, it is necessary to reflect on the training of nurses. Since the implementation of the National Curriculum Guidelines (DCN) of the undergraduate nursing course, changes in the health training process have been taking place, specifically regarding the curricula and the implementation of innovative learning methodologies\(^1\). The use of active methodologies, with a focus on realistic simulation, stands out\(^2-3\).

The use of innovative methodologies favors the teaching and learning process and directs the exposure of students to the realistic simulation environment, providing an increase in competence and dexterity in the execution of procedures when compared to traditional methods of clinical practices\(^3\). Simulation also favors the creation of means for assessing multiple professional competencies and skills, which are fundamental for the professional training of nurses, how to act and think critically, as well as decision-making skills\(^3-4\).

The simulation process begins with the presentation by the teacher to the student or to a group of students of a real case, where he will fully assume responsibility for the conduct of the case in question\(^4-5\). The technique can be performed using high-fidelity, extremely realistic mannequins, with real-time responses; medium fidelity, more realistic and can offer auscultation of breathing, heart, pulse or low fidelity sounds, with static materials, less realistic and used for specific procedures\(^6\).

The main situations present in pre-hospital care demonstrate that the professional’s agility minimizes the risk of sequelae and increases the victim’s chance of survival. However, what is perceived in practice is a feeling of insecurity of the newly graduated nurse to work in the urgency and emergency services secondary to an insipient academic formation of effective training to assist the critical patient. The nurse’s profile to work in these sectors must demonstrate agility, skill and capacity to establish conscious and safe priorities and attitudes\(^7\).

Due to the high demand for practical knowledge of the graduates, the assisted training method, which was previously performed with real patients during the clinical internship, has been replaced, in part, by realistic simulation, which provides the advantage of consistent learning, decreasing unfavorable outcomes in actual practice\(^6\).

For the simulation to be effective, the assessment instrument must be well structured, encompassing all the knowledge, attitudes and skills presented by the students. In this sense, making use of a validated instrument gives methodological rigor to the process, well-defined steps and precise procedures. Content validation consists of assessing whether the selected items can measure the concept to be measured. On the other hand, semantic validation aims to identify whether the items of the instrument have an acceptable level of understanding of technical terminology\(^7-9\).

In this way, the importance of thinking about the realistic simulation methodology as a technology applicable to educational actions in the academies is visible, since it allows the student the opportunity to expand skills not pre-
Previously explored and become a differentiated professional in the education market. That said, this study aimed to validate a technical product for assessing the skills, abilities and attitudes of nursing students during the practice of realistic simulation in pre-hospital care.

**METHODOLOGY**

Methodological study for validation of technical product, developed in three stages: construction of the instrument, content validation and semantic validation\(^{10}\). The research was developed at a Private Faculty of the State of Pernambuco from March to June 2019.

In the first stage, construction of the instrument, the definition of the object and identification of items corresponding to the skills, abilities and attitudes needed by the nursing student in assistance in pre-hospital care through a literature review on the specific area in the Bases of CAPES journals. The Form was divided into two parts: The first, containing eleven questions regarding the characteristics of expert judges, and the second, with twenty-one items related to pre-hospital nursing care, organized in accordance with the Likert Scale and with variations of 1 to 5, 1 being “Very irrelevant”, 2 “Irrelevant”, 3 “Not very relevant, 4” Relevant “and 5” Very relevant”.

The content validation was performed by expert judges through expertise in pre-hospital care and the choice was subsidized by an intentional sampling anchored in the Fehring criteria. Fehring’s criteria take into account academic training, professional performance (teaching, research and extension), refresher course and scientific production in the specific area\(^{11-12}\). Judges were invited to participate, those who reached a minimum score of seven points, totaling eleven experts. The semantic validation was performed by six expert judges and a lyricist judge, in order to identify orthographic and understanding disagreements under the terms provided in the instrument.

The data were entered with double entry in EPInfo for validation of the database and subsequent correction of the differences found. Once validated, the data were exported to IBM® SPSS® Statistics software, version 20.0 where the analysis was performed. In order to verify the degree of validity attributed by the judges to the items in the proposed questionnaire, the measures were calculated: I-CVI (content validity of individual items), S-CVI / AVE (the proportion of scale items assessed as relevant and very relevant by each judge) and S-CVI (average of the proportion of items assessed as relevant and very relevant by the judges) 24,25. In order to be considered adequate, each evaluated item presented a Content Validation Index ≥ 0.80 giving a statistical significance of - P ≥ 0.05\(^{8}\).

For the level of credibility and reliability of the instrument, the Cronbach’s alpha coefficient was used. A cutoff value of 0.7026 was established in accordance with the reference values of the instrument’s internal consistency. After the first round, none of the items received a value lower than the established cutoff point, therefore, it was not necessary to make adjustments to the technical product due to the consensus among the experts\(^{8-9}\).

The study is in line with Resolution No. 466, of December 12, 2012, of the National Health Council (CNS) and was approved by the Research Ethics Committee of the Pernambucana de Saúde Faculty (CEP-FPS) under the number of CAEE: 08331319.0.0000.5569.

**RESULTS**

Table 1 presents a characterization of the socio-academic profile of the invited judges to perform the content and semantics validation of the aforementioned instrument. It appears that the majority is female (90.9%) and the average age is 42 years. As for the academic and institutional profile, the majority...
completed the undergraduate course 10 years ago or more (63.6%), 72.7% of the professors have a master’s degree and have 10 years or more of work at the institution (54.5%). The election of the judges was conditioned to their expertise in realistic simulation with a focus on pre-hospital care. Table 2 validates this information by showing that 72.7% have clinical experience in the pre-hospital care area and 63.6% have specializations in the pre-hospital care area. It is also observed that nine of the eleven judges have experience with realistic simulation (81.8%) and already use the technique for training in pre-hospital care.

The second stage of the construction of the instrument, consisted of twenty-one items that deal with knowledge, attitudes and skills related to pre-hospital nursing care. Chart 1, shown below, lists these items, the letter “Q” being used for the abbreviation of the word question.

To analyze the validity of each item, the Content Validity Index (CVI) was used, assigning a value of 0.8 as a minimum cut-off point (8).

Table 3 shows statistically that all the calculated CVIs (I-CVI, S-CVI / AVE and S-CVI) were above 0.8, indicating high validity of the instrument regarding the questions of realistic simulation in pre-hospital care (14). It is also observed that the average of the I-IVCs and the average of the proportion of items assessed as relevant and very relevant by the judges was 0.96.

The reliability analysis for the judges’ response to the instrument of realistic simulation questions in pre-hospital care, through the measurement of Cronbach’s alpha (Table 4).

The value of Cronbach’s Alpha was 0.79, considering the instrument as substantial according to the internal consistency reference values (8-9).

**DISCUSSION**

In view of the priority competencies for nurses defined by COFEN Resolution No. 551/2017 in the face of a pre-hospital care scene, professionals need to develop domains related to the ability to work in teams, communication and leadership, self-control,
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Knowledge and technical skills, facility to delegate tasks and be a health educator for your team (13).

It is worth mentioning that the simulation carried out in the researched educational institution does not have fixed situations. These are scenarios that undergo modifications every six months, with no specific case, therefore, to validate the technical product, both content and semantic validations were performed, guaranteeing its reliability.

Only six items evaluated received a different score of 1.00 (Maximum Score) in the evaluation by the CVI, which are: Removes the victim’s clothing to identify injuries (ICD: 0.82); Promotes victim warm-up to prevent hypothermia (ICD: 0.82); Positioning (CIV: 0.91); Performs helmet removal technique (CIV: 0.91); Applies Glasgow Scale appropriately (CIV: 0.91);
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It is worth mentioning that even with CVI scores below 1.00, the items have high validity and are not included in the cut-off margin that would be 0.8.

In the case of a realistic simulation carried out in an educational institution, some aspects that conditioned the lowering of the CVI must be analyzed. Study (14) agrees with the present research when it mentions the partial removal of clothes during realistic simulation processes, this fact to ensure privacy and minimize the exposure of the students who integrate the simulation.

The same occurs with the request for help and indication to call 192. The simulation, in the case of this study, starts with the arrival of the pre-hospital care team and not with the trauma kinematics since the shock, in this sense, call for SAMU (Mobile Emergency Care Service) does not have much relevance in this simulation, but still, it remained within the confidence interval and was maintained in the instrument (15-16).

The instrument’s internal consistency was measured using Cronbach’s alpha coefficient (8-9). The cut-off point established for Cronbach’s alpha for each question evaluated was 0.70, with three questions (Q2, Q3 and Q14) being removed among the 21 listed, the instrument still remains with Cronbach above 0.8, indicating that its reliability value remains substantial or even has an almost perfect consistency (greater than 0.80).

In this sense, the technical product called “Form for evaluating knowledge, skills and attitudes in pre-hospital care in Realistic Simulation” was validated, with 21 items evaluated with satisfactory CVI and Cronbach.

**CONCLUSION**

There was a limitation in this study due to the lack of definition of the scenes worked on in pre-hospital care, therefore, there is no consensus that may come to define specific characteristics of care. However, the statements...
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presented in the instrument encompass most of the attitudes and skills required in the care of patients who need pre-hospital assistance. As it is an urgent and emergency teaching, where there is a wide variety of scenes that can be worked on, the instrument can be adapted to the scene in question. The fact that the scenes are not fixed contributes to a greater reliability of the realistic simulation, since it seeks to be the closest to reality.

It is expected that the construction and validation of this technical product will contribute to a better academic evaluation of the student during the practice of realistic simulation, seeking to achieve the learning objectives required for a comprehensive and efficient clinical practice, essential factors during pre-hospital care.

REFERENCES


