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Brief Communications

Scenario for a simulation of health services' waste: a methodological study

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ABSTRACT

Aim: to validate the contents of a scenario to be used in the form of a simulation of the management of *Resíduos de Serviços de Saúde* (RSS - Health Services' Waste) **Method:** this is a methodological study that has been developed in three stages: the scenario elaboration, the scenario content validation by experts and testing of the scenario. **Results:** three experts analyzed the appropriateness of the scenario and suggested adjustments to adapt the elements to the learning objective. The scenario was tested with undergraduate students who also contributed to the refinement of the scenario. **Conclusion:** a scenario, aimed at stimulating learning in terms of the proper management of RSS, was developed for use in a simulation. **Implications for practice:** the scenario relating to RSS management can be used in new studies, in teaching and in the training of health professionals in different contexts.

Descriptors: Validation Studies; Simulation Training; Medical Waste; Nursing.

RESEARCH DIFFERENTIAL

What is known?	Validated scenarios result in successful simulation
Contributions to what is known?	A validated scenario on the management of Health Services' Waste

OBJECTIVE

To validate the contents of a scenario to be used in a simulation of the management of *Resíduos de Serviços de Saúde* (RSS - Health Services' Waste).

METHOD

This is a methodological study developed in three stages: the scenario elaboration, content validation of the scenario by experts, and scenario testing in a simulation.

The elaboration of the scenario was based on research into the literature regarding the management of RSS, in terms of the Technical Regulation of the Resolution of the Collegiate Board of Directors 306/04 for the management of Health Services' waste[1] and in the experience of the researchers with regard to the subject.

The elaborated scenario comprised a hospital environment and the organization of a surgical clinic, where a young adult patient received information about his discharge from a medical team. Participants in this scenario regarded the nursing team as the responsible for handling the RSS generated on the site. The fictitious clinical case involved a patient with gastric cancer, who was being discharged from the hospital after surgery and chemotherapy.

In order to evaluate the performance of the participants in the simulation, an instrument composed of the clinical situation, related scenes and the expected actions that the participants performed in each of these scenes, was constructed. The expected actions were set out in a checklist, with dichotomous responses as to whether or not such actions were carried out by the participants.

In terms of content validation, three experts analyzed the organization, its scope, the degree of objectivity, the relevance of each element of the scenario (clinical situation, objectives, type of simulator, necessary materials and equipment, established prerequisites, scenes with the respective actions expected to be performed by the participants), and also the participants' performance appraisal tool. Questions related to the content of the scenario, were analyzed in terms of the dichotomous answers (yes or no). At the end of the process, the experts were able to comment in the event that they wished to do so[2].

The panel of experts was composed of professionals with experience and publications on simulations and/or RSS. A convenience sample of professionals was selected based on scientific articles published on the topic. They were contacted by electronic message and were invited to participate in the study, and consented by signing the Informed Consent Form (ICF). Notable experience of the subjects of the study was a strict criterion, since it was the authors' choice to consider a limited number of experts.

The analysis of the data involved a consideration of the percentage of agreement with regard to each criterion; 90% agreement was established for each. The written considerations on the part of the experts were analyzed individually by the researchers. This stage was developed between October and December 2015.

In January 2016, the validated version of the scenario was revealed to 10 students in the third and fourth year of undergraduate nursing,

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in order to refine the researchers' familiarization with the scenario and with the instrument used for the evaluation of the participants' performance.

This stage was carried out in a practical nursing skills training area of a public hospital that is used for clinical teaching. The students agreed to participate by signing the informed consent form.

This study was developed after approval of the Research Ethics Committee of the University of Araraquara (Opinion 1,219,563) and followed the requirements of Resolution 466/2012[3].

RESULTS

The panel of experts was composed of three nurses, Masters in nursing, one of whom was a specialist in realistic simulation and scenario elaboration, and two of whom had professional experience and publications on RSS. On average, they had 20 years' experience of nursing training.

In terms of the experts' analysis, 100% agreement was obtained regarding the organization, comprehensiveness, objectivity and pertinence of the structure of the scenario and the evaluation instrument used to assess the commitment of the participants. The basic structure of the scenario is presented in Table I.

The addition of a place that represents the purge area in the clinical environment was suggested by the experts and this addition was accepted by the researchers, as a means of guaranteeing the fidelity and the realism of the scenario, since the waste is sent to this place after it has been generated.

Other suggestions followed were the combination of two scenes, hand hygiene and clothing with individual protection equipment, because, in the experts' view, such actions would occur simultaneously and not separately as initially indicated. Moreover, the addition of materials in the scenario was accepted in order to form more complete groups of waste that are routinely generated in the daily work of a surgical clinic and have to be discarded.

The removal of the bateries from the scenario was requested by one expert in order to avoid misunderstandings. However, this item was retained in the scenario, since the correct management of such residue is still debatable among health professionals, in the researchers' experience.

In January 2016, the scenario was applied to ten undergraduate nursing students. Initially, five students participated, and it was found that there was a need to reduce the description of the clinical case in that repetitive and irrelevant information with regard to the activity was identified. Following these adjustments, the scenario was applied again to another five students - at which time no adjustments were deemed necessary, and the process of the construction of the scenario was considered complete.

DISCUSSION

Constructing scenarios to be used in a simulation is a complex and methodical activity, as they are the basis for the quality of the teaching strategy and of the necessary realism[4]. The RSS management scenario was developed in such a way as to generate details of the fundamental elements for simulation, composed of a theoretical framework based on scientific and political principles, the clinical experience of the authors and the experts involved, and in the testing of their feasibility with the target public.

Research involving simulation is increasing in the health area; however, no descriptions regarding the process of the construction and

Table I. Basic elements of the scenario Management of RSS, 2016, Araraquara-SP.

SCENARIO: Managing RSS	
Responsible	Nursing undergraduate teachers.
Target Audience	Nursing undergraduate students.
Learning Objective	Ao final da simulação, espera-se que os participantes realizem adequadamente o manejo dos RSS.
Expected actions	- Hygiene of hands before and after handling of waste. - Paramentation with Individual Protection Equipment. - Collection of the waste dispersed by the unit and accommodated in a tray. - Routing of wastes to purge. - Disposal of Group A (Biological) and B (Chemical) wastes in a milky white bag with infecting symbol. - Disposal of Group B (Chemical) waste in an orange colored bag with a chemical symbol. - Disposal of waste from Group D (Common) in a black bag. - Disposal of waste from Group E (Perforation-cutting) in a rigid box.
Duration	10 minutes
Local	Skills training lab.
Participants	1 - 5
Simulator	Low fidelity.
Patient characteristics	Female gender, with nasogastric tube, peripheral venous access, surgical incision with occlusive dressing in the abdominal region, colostomy with Karaya bag, delayed bladder catheter and diaper.
Equipment	Infusion pump, hospital bed, gas meter, waste bins intended for Group A, B, D, and E.
Materials	Procedure gloves, gauze, crepe bandages, micropore, serum bottle, pump equipment, multivials equipment, peripheral venous device, nasogastric tube, Karaya colostomy bag, 10ml syringes, 40x12 needles, capillary glycemia reagent tapes, bladder catheter of delay, secretion bag, humidifier, spectacle-type nasal catheter, plastic and glass ampoules, paper towel, liquid soap, gel alcohol, lancet, tray, and batteries.
Prerequisites to participate	Students who studied the discipline of semiology and semio-technique
Clinical case	57-years-old patient, conscious, oriented, hospitalized 20 days ago, with diagnosis of cancer in the abdominal region, submitted to surgical procedure and chemotherapeutic treatment. He features a nasogastric drainage tube, peripheral venous access in the right upper limb, colostomy bag in the region of the descending colon, surgical incision in the hypogastric region occluded with clean and dry gauze, vesical probe of delayed drainage, use of diaper and crepe bandage in the calf with scarred bruises. In the unit there is the availability of nasal catheter type glasses for administering oxygen therapy, if necessary, according to medical prescription. At the time, the chemotherapeutic infusion was terminated, the contents of the probes were discarded and the probes were also removed. After medical visit, he was discharged, and the nursing team was notified to organize the unit.

validation of scenarios used in these studies can be found. In the same sense, there are also few studies on the management of RSS[5]. Thus, the developed scenario, with the objective of managing RSS, can be a tool for researchers and professionals in the area, either for the development of new research or for the training of professionals in this area.

The research on RSS evidence indicates the need for teaching and awareness on the part of health professionals in terms of their management, both in academic and professional environments, given the context in which health professionals are largely ignorant in terms of the types of RSS and of the importance of their correct handling in practice. Educational action

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needs to stimulate debate and reflection on the related environmental and ecological issues[6].

In the literature there are questions about the way this theme is being worked in educational institutions, because the strategies adopted should value critical-reflexive reasoning in order to awaken human and collective consciousness among health professionals[6].

In research carried out in a University Hospital with a nursing team on the management of hazardous waste, the nurses themselves recognized the importance and effectiveness of training that dealt with the theme, but also declared a degree of discontent with regard to the way it occurs. This discontent was directed towards the passing on of information and the provision of specific guidelines on norms and institutional routines in terms of the organization of work, in that these do not add knowledge and lead to effective change in professional practice[7].

A study carried out with teachers from the health areas of higher education institutions reinforces the need to use innovative pedagogical practices in environmental health education. These teachers affirmed that teaching related to RSS in the context where they work is not considered exciting by students, as is the case of emergency education[8]. Thus, teachers need to use motivating strategies to awaken students' willingness to learn about RSS as well. Simulation is an example of such motivating strategies, since research results on the use of this method show the satisfaction of nursing students regarding participation in simulation activities in different contexts[9].

The number of experts considered for scenario content validation was a limitation of this study, since the literature indicates the need for a larger number for more robust concordance calculations. However, the level of experts' contributions and the development of the simulation with the students, were determinants when it comes to building a valid scenario.

CONCLUSION

A trajectory for the validation of a learning scenario regarding the proper management of RSS for use in simulations was described. This trajectory comprised the elaboration of the scenario by undergraduate nursing teachers, followed by validation of the content by experts, who suggested important structuring of the elements of the instrument. These included the organization of the environment, the distribution of materials and the organization of scenes. When applying the scenario to undergraduate nursing students, it was possible to verify its feasibility, indicating therefore that this instrument was appropriate in terms of achieving its learning objective.

IMPLICATIONS FOR PRACTICE

Using validated scenarios in simulations provides greater safety for facilitators during activities and greater accuracy in terms of the learning objectives. The scenario dealing with RSS management may be an instrument that can be used in future studies, as well as a teaching aid in the area of nursing and in the training of health professionals in different contexts.

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