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Evolution for emancipatory praxis: development of the realistic simulation method in undergraduate teaching in nursing

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Abstract

Aim: analyze the perspectives of implementation and effectiveness of the realistic simulation method in nursing undergraduate teaching, from the point of view of teaching nurses who chose to use the method in their disciplines. **Method:** Descriptive exploratory study with a qualitative approach. Participants were teaching nurses from a private university. In the data collection, performed through a semi-structured interview, perceptions about the implementation and effectiveness of the realistic simulation method were recorded. The reports were grouped in thematic categories, according to the theoretical reference Thematic Content Analysis of Minayo. **Result:** the steps taken, training for simulation-based teaching and facilitating factors in the implementation of the method, were identified. **Conclusion:** Realistic simulation as an active teaching method stimulates critical thinking and clinical reasoning, which are amenable to learning and improvement. These reflections refer us to the question that the change in education presupposes caution and extreme dedication of the faculty for implementation and achievement of the method.

Descriptors: Simulation; Nursing students; Education in Nursing.

INTRODUCTION

The reality of the case unity studied reveals a private institution of higher education in the city of Duque de Caxias, in the state of Rio de Janeiro, with a wide range of courses in the health area, which, over the last years, has been seeking the incorporation of active methodologies in the curricular program. The concept of active methodologies is defined as a way to find solutions to a problem pre-established by educators, becoming an interactive process of deepening, analysis, dialogue, studies, and individual or collective decisions by participating students[1].

Simulation can be defined as a technique in which a simulator is used, simulator being considered an object or partial or total representation of a task to be replicated. In this context, it can be affirmed that, as a teaching method, the realistic simulation is based on the active methodology--based learning in problems[2].

The active methodologies and the simulation in the process of training in health and nursing make it possible to think about the teaching/learning process from a perspective of knowledge construction in which students and teachers participate effectively[3].

The various simulation techniques as a pedagogical model in various scenarios and with low, medium and high complexity mannequins, reproducing aspects of reality in an interactive way for the group, boosting the teaching and learning process[4]. The simulation contributes to the effectiveness of the process of active, critical and reflexive learning, resulting from the approximation of nursing care reality, favoring the understanding of the relation between action and results achieved in learning[5-6].

It was intended to reveal in this study the conceptions of implementation and effectiveness of the realistic simulation method and its contingencies in the construction of knowledge and orientation of learning in the higher education unit studied. The approach with the teaching nurses, who effectively perform simulation in their disciplines for the purposes of this study, enabled this research.

We highlight that, within the simulation community, there are initiatives involving systematic reviews of the literature, committees and summits, whose objective is to identify a research agenda in the use of simulation for learning. It can be said that there is a need to form research groups[7].

It should be emphasized that the basis of the restructuring, proposed in the National Curricular Guidelines (DCN, acronym in Portuguese) of the courses in the health area, directs the profile of the graduate, egress/professional, as: nurse, with general education, humanist, critical and reflexive[8].

In this context, in its restructuring of educational planning process, the studied unit sought to approach with the DCN/Nursing, restructuring its curriculum and didactic planning, seeking to incorporate active methodologies. Simulation has emerged as a key to improving patient safety, and numerous health and education organizations have been investing in high fidelity simulation centers[9].

It is emphasized that the expectations of nurses and students, referring to the clinical teaching of undergraduate nursing, are directed towards a reciprocity of intentions related to the theory-practice integration and to the proactive and reflexive posture required by the subjects involved[10]. It should be noted that the simulation provides a reflection after the experience experienced in the debriefing phase, that is, post-event interaction that seeks to help students reflect on what, when, how and why they did it and what needs to be improved[11].

In this context, it is considered that the reflexive process is increasingly valued in edu-

cational practice. Its purpose is to train creative, curious and capable professionals to transform reality[12].

AIM

Analyze the perspectives of implementation and effectiveness of the realistic simulation method in undergraduate nursing education, from the point of view of teaching nurses.

METHOD

This is an exploratory and descriptive study, in the case study modality. This method contributes to the in-depth knowledge of individual, organizational, group, and social phenomena[13].

The inclusion criteria used in the selection of the participants refer to nursing education teachers at the higher level, who worked in the graduation of the unit of the case studied and who used the simulation method and accepted to participate in the study. Graduated undergraduate nursing teachers who were on maternity or leave without pay were excluded.

The case study unit was a private institution of higher education in Nursing, in the city of Duque de Caxias in the state of Rio de Janeiro. The participants of the study were seven (7) nurses teaching nursing education at the higher level, who were in the undergraduate unit of the case studied. For the technical operation of the data collection, the semi-structured interview technique was applied with the teachers, believing that it was better suited to the study objectives. The places and dates for the interview were determined according to the availability of the interviewees. The interviews were recorded for later transcription and in-depth analysis. Data collection occurred from January to June 2016.

The study complied with Resolution 466/12 of the National Health Council that deals with research with human beings and was submitted to the analysis of the Ethics Committee for judgment on the principles of bioethics, and approved under CAAE numbers: 50977915.6.0000.5238 and 50977915.6.3001.5283.

It is reiterated that the identity and production of the data coming from the participants were confidential, and were cited by means of their identification codes.

It should be noted that the data collection was initiated after due approvals, followed by the acceptance of the participants, manifested by the signing of the Free and Informed Consent Term, and by the agreement of voluntary participation in the study, thus guaranteeing their anonymity.

The data obtained were analyzed and interpreted according to the technique of Content Analysis in the Thematic modality[15].

The data were organized according to the following chronological poles: pre-analysis, material exploration and treatment of results obtained, and interpretation. Thus, after the transcription of the data, necessary thematic breakdowns were performed, grouping them into categories according to the frequency or presence of the appearances of the themes in the information that emerged in the interviews.

RESULTS

The following table demonstrates the diversity present in the professional practice of the participants, as well as the differentiated profiles, which lead to the insertion of the realistic simulation in their activities:

It is noteworthy that transformations were necessary in the educational process of the

studied unit so that the form of transmission and assimilation of knowledge could approach possible active methodologies, among them the realistic simulation.

The teachers' statements were grouped into three (3) thematic categories: stages covered; training for simulation-based education; factors facilitating the implementation of the method.

CATEGORY I: PERCUSSED STAGES

Regarding the first thematic category, when asked about the steps taken by the institution to structure and implement the simulation method, the teachers presented the following reports:

> (...) In 2008, 2009 was very much in charge of each teacher (...) In fact, it was another attempt to give a dynamism in class, to try to do some activity, create a case, create a scenario, something (...) (Teacher 06)

> (...) There, before 2012, working in adverse conditions, for not having an adequate simulation center, and improvising in relation to the scenario (...) (Teacher 04)

It should be noted that the group of teachers who had an interest in the area of simulation and presented an initiative for the first steps of the process of implementation of the method was formed by teachers who taught subjects from the emergency area and critical patient, as explained in the reports below:

Table 01. Characterization of Teaching Nurses, Rio de Janeiro, 2016

Participants (Teachers)	Age	Year Graduation	Teaching Time	Teaching Time at Unigranrio	Area of Expertise	Specialization (Lato Sensu or Stricto Sensu)
Professor P1	47 years	92	14 years	14 years	Intensive Care and Emergency	Esp. Intensive Therapy and Esp. Acupuncture
Professor P2	44 years	94	13 years	13 years	Intensive Care and Emergency	Housing in Clinica Médica, Esp. Cardiology Nursing, Master
Professor P3	35 years	2002	7 years	7 years	Mental Health and Health Management	Esp. Mental Health, Esp. Management of Health Systems, Master
Professor P4	38 years	2000	14 years	14 years	Intensive Care and Emergency	Esp. Circulação Extracorpórea, Mestre, Doutorando
Professor P5	39 years	2001	8 years	8 years	Mental health	Esp. Mental Health, Esp. Nursing work, Master
Professor P6	35 years	2005	8 years	8 years	Intensive Care and Emergency	Esp. Intensive Care, Master
Professor P7	31 years	2009	4 years	4 years	Emergency	Residency in Clinical and Occupational Nursing, Master

Source: Own authorship

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> (...) First it was a time of teachers who had an interest in the area, wasn't it? In my perception, it began with a group of the "emergency department" (...) (Teacher 04)

> (...) but it was much highlighted in the initiative of each discipline, here in the University. The ones who did it was the "pre-hospital emergency department" and the "critical patients" (...) (Teacher 06)

It is important to highlight that, at the beginning of 2012, the University hired a professional who had expertise in realistic simulation, which made teachers of the undergraduate nursing course begin to participate in courses and congresses directed to the area of simulation realistic. Observe what the teaching nurses said about this period:

> (...) This was discussed with the NDE (Structuring Teaching Center) and began to be implemented in a very simple way, first being a course for teachers and then it was effectively institutionalized (...) (Teacher 02)

> (...) the assistant director of the time also comes with an expertise of this methodology and the superior administration begins to be sensitized (...) (Teacher 06)

In this context, in 2012, the first steps were taken to plan and implement realistic simulation as a teaching methodology, providing for the creation of an "initial working group". It should be noted that the group was composed of four (04) professors of the nursing undergraduate course itself and they received orientations from the members of the Teaching Structuring Nucleus (NDE, acronym in Portuguese) since their formation.

In the meantime, at the beginning of the 2012 semester, this working group met with NDE members, and four (04) disciplines were identified, in different academic periods, with the potential to initiate the simulation process as pilot disciplines.

In the same year, it was essential to maintain the search for the sensitization of the teaching staff, with a view to the use of active teaching methodologies in the nursing curriculum, through workshops, lectures and internal debates among groups of teachers. The model of the institutional simulation script was elaborated in this period. Among the teachers' testimonies are the following reports:

> (...) The first contact I had with the simulation here was simply an exchange of knowledge; it was a workshop we carried out with the students of the last periods, that is, the seventh and eighth grade students (...) (Teacher 03)

> (...) So with these workshops and with the creation of these instruments I think it boosted college (...) (Teacher 06)

In 2013, there was the first teacher training workshop offered by the Nursing School, and the beginning of the involvement of monitors with simulation. It is also worth mentioning the involvement of the university's superior management to guarantee financial investments, with a view to developing the method. This fact can be seen in the following report:

> (...) Then there was a second movement, perhaps the second stage, which was when this began to have

> a force in the institution, the higher management itself understood that it needed to make better investments (...) (Teacher 04)

The second teaching training took place in 2014 and was promoted by the Coordination of the School of Health Sciences. The event had an interdisciplinary character, since it was offered to all the teachers of the School of Health Sciences. It is important to mention the speech of one of the teachers, in relation to the relevance of the realistic simulation to the Nursing School:

> (...) So I think the simulation ends up being, I mean, that it ends up entering a larger context, macro in the university, of approaching the active methodologies; I think the simulation was a great "boom" in the nursing course; I think the simulation brought the other active methodologies. They came together (...) (Teacher 06)

From the beginning of the first half of 2014, the solidification of the realistic simulation begins to occur, due to the inauguration of the realistic simulation laboratory of the Health Sciences School.

> (...) The construction of the laboratory was important (...) the laboratory contributed a lot. I think one thing is pretty cool about the lab: it has all the stuff you need to use... because you have the camera, the television, the sound insulation; because if it didn't have it (...) I wasn't going to carry out the method with quality... not at all, because I wouldn't be able to do the whole process. (...) (Teacher 05)

In this perspective, it should be emphasized that the teaching staff of the School of Nursing adhering to the simulation method continued to invest in personal trainings and internal discussions about the method.

CATEGORY II: TRAINING FOR SIMULATION-BASED EDUCATION

Regarding the second thematic category, when asked how their training for simulation--based teaching has taken place, the following reports were highlighted:

> (...) Well, first I took an initial course to learn the basic things of the method, how to do the script (...) I also had a discipline for the doctorate in which we applied the simulation, so it was important (...) (Teacher 02)

> (...) the readings, the participation, the construction together with the teachers (...); but the participations in the congresses are also favorable. (...) (Teacher 03)

> (...) Today, in my doctorate we study the active methodology, not just simulation, so we are constantly updating ourselves on this issue. (...) (Teacher 04)

> (...) the university itself has held some workshops here and we were listeners a few times, and sometimes we were lecturers. The participation of congresses... (...) (Teacher 06)

Concerning the construction and maintenance of knowledge, we emphasize that the group of teachers interviewed participates annually in various types of events. These tea-

chers participate in about 3 to 5 events on average per year, including: congresses, seminars, workshops, among others. It can be concluded, in this way, that there is a need for this community to keep up to date.

CATEGORY III: FACILITATORS

The third thematic category highlights the facilitating factors, in the perception of the teachers, in the process of implementation of the realistic simulation method in the University. The first facilitating factor that deserves attention is the personal interest and involvement of the teachers, as we can see below:

> (...) I think college made things easier because the people they brought in really believed the idea. And the teachers who joined, received it in a very open way (...) those who received it made it work (...) (Teacher 02)

> (...) it was a facilitator because the group – we were four (4) or five (5) teachers – had a lot of involvement with the method. So, this made it much easier because, in order to propagate it with the other teachers involvement was needed (...) (Teacher 04)

It should be emphasized that a second facilitating factor found in teachers' reports involves the coordination of the School of Health Sciences and the School of Nursing in promoting internal discussion among teachers through training, debates and workshops on the incorporation of active methodologies:

> (...) the School of Health Sciences did a Show of active methodology (...) she prepared a sample to share our experiences that was an awakening here (...) I still felt very lost in the simulation (...) (Teacher 03)

> (...) But undoubtedly, the first workshops facilitated a lot because they gave direction to the first step (...) (Teacher 05)

> (...)And this was possible when we started the discussion workshops, for sure (...) (Teacher 07)

Moreover, in the perspective of the University's involvement in the process of structuring the method, the third facilitating factor in evidence in the teachers' discourses was: the construction and structuring of the simulation laboratory. Another highlight, still in this context, was the hiring of a nurse to manage the laboratory's internal processes:

> (...) the laboratory is set, ready and beautiful (...) the lab nurse is the one who presented the work. She is a great facilitator for the simulation (...) (Teacher 03)

> (...) today the teacher can do the scheduling and can already have the structure to mark the classes and be able to play the rest of the process (...) with the arrival of the nurse (...) (Teacher 04)

> (...) Another thing was the construction of the laboratory, which also contributes (...) because the method needs a space to bring reality and fidelity to the case (...) (Teacher 07)

It was observed, as a fourth prominent facilitator factor in teachers' speeches, the involvement of monitors in the realistic simulation

activity. In this context, the following reports were highlighted:

> (...) and the availability of monitoring (...) as we have a monitor. When this student is with us, he ends up being the victim and the patient ends up being the actor (...) (Teacher 06)

> (...) The monitor is important because he's not part of that group, so he brings a more realistic character to the scene. (...) Sometimes I bring the monitor of the night shift to run a simulation on the day shift and it's nice (...) (Teacher 07)

The University's incentive to participate in scientific events appears as the fifth facilitating element in the process of consolidating the methodology. It is evidenced that this approximation of the teachers with the realistic simulation method also provided the effective production of research. Illustrating this reality, the following reports were highlighted:

> (...) I also presented two papers in a simulation congress about what I had done in terms of the simulation in college. It was in São Paulo (...) (Teacher 02)

> (...) it's the very stimulus of the board, of the coordination to stimulate the people to go to the congress. After we started using the method and doing research we managed to spread research abroad (...) (Teacher 06)

DISCUSSION

In the present study, the objective is to describe aspects that make up the implementation of the realistic simulation method in nursing undergraduate teaching. It is emphasized that the constant changes consubstantiated the solidification process of the realistic simulation method in the researched institution.

It should be noted that the first step to foster the process of implementation of the simulation method was given by an initial group of teachers, from the Emergency Department and Intensive Care areas, who showed great interest in the subject, and, later, in other areas of undergraduate nursing studies in the unit studied, such as mental health, pediatrics, and public health.

It is perceived a difficulty in relation to education, training and updating, with a view to the realistic simulation method, by the institutional teaching staff. It is notorious that the great majority of teachers seek to invest in the training and updating of their areas of specialties, leaving the updates about simulation-based teaching to the background. It is inferred that it is necessarily costly to invest financially to keep abreast of multiple areas of knowledge.

The triumph for the acquisition of the laboratory provided a greater involvement of the School of Health Sciences Coordination in pleading, together with the management group of the university, the acquisition of new materials and low, medium and high fidelity simulation manikins.

It should be noted that low fidelity human simulation manikins are static, low cost simulators or anatomical parts such as intravenous puncture arms and bladder catheterization[16]. Average fidelity are mannequins that

provide responses to stimuli made by students through various physiological sounds and the high fidelity presents emission of sounds and noises, as well as ocular and respiratory movements that allow the monitoring of blood pressure, pulsation and electrocardiogram and also simulates responses to drugs[17].

Thus, it can be affirmed that the standardization of the simulation laboratory and the acquisition of different types of manikins were propelling factors for a greater engagement of the teaching staff that approached the effectiveness of the simulation method.

It is emphasized that the method imposes a constant mechanism of organization and planning by the institution, and a continuous improvement and enhancement on the part of the teachers that use it. It should be stressed that faculty should be aware of the range of student perceptions and adapt their teaching approaches to maximize student learning[19].

In this context, from the reality experienced in this study, the following table presents recommendations for the institutional implementation of the realistic simulation method:

As can be seen in the previous table, it is suggested that the acquisition of low, medium and high fidelity simulation materials and mannequins, as well as the possible realization of a simulation center, should be the last stage to be achieved.

Table 2. Recommendations for the institutional implementation of the realistic simulation method, Rio de Janeiro, 2016

1	Set up an Initial Working Group (GIT, acronym in Portuguese) with teachers who have an interest in deepening and developing the method in the educational institution.
2	The teachers who are part of the GIT must participate effectively in the scientific events that involve the realistic simulation theme at national and international level.
3	Teachers who are part of the GIT must take immersion courses in the area of simulation in order to know and deepen in the steps of the teaching method.
4	Teachers who are part of the GIT must carry out technical visits in Simulation Centers and/or existing simulation laboratories, at national and international level.
5	The teachers who are part of the GIT must approach the companies that commercialize the high technology equipment, such as computerized mannequins that react to the procedures performed, in order to know and master the technological dynamics and to evaluate which are the best equipment that could fit the institution.
6	Teachers who are part of the GIT should join the institutions/associations that foster the simulation dynamics at the national level.
7	Hire an education professional who has expertise in the realistic simulation method to support the GIT.
8	Sensitization of the institutional teaching staff in relation to the simulation method. 8.1- The best way of sensitizing and approaching the method with the teaching staff is through workshops, lectures and internal debates, as well as pedagogical meetings for the construction of tools guiding the practice of realistic simulation, such as the simulation script. 8.2- The teachers who are part of the GIT should encourage and organize the activities together with the institutional coordination. 8.3- It should be noted that at least one cycle of activities should be planned annually to discuss the realistic simulation method with the institution's academic community.
9	Raising awareness and involvement of the institution's higher management to guarantee financial investments with a view to the realistic simulation method.
10	Have the own Simulation Center and/or realistic simulation laboratory, containing low, medium and high fidelity simulation materials and mannequins.

Source: Own authorship

It should be noted that simulating does not mean mastering the technology, but rather mastering the method. In this context, it is suggested that the faculty be sensitized and master the method to later gain technological mastery. The results show the factors facilitating the effectiveness of the method, as highlighted in Table 3:

CONCLUSION

Nursing education, at a university degree level, should be full of transformations, involving all the characters in this context: teaching nurses, students, monitors, managers, coordinators, and directors, directing them to an emancipatory praxis. Therefore, this work becomes an

Table 3.- Factors favorable to the process of realization of the realistic simulation method, Rio de Janeiro, 2016

	FAVORABLE FACTORS	CONTEXT
Factor 01	Starting Point	Personal interest and motivation of the Initial Working Group. Aim: sensitization and enchantment of the faculty.
Factor 02	Internal Training	Promotion of the method among nurses, from a programmed periodicity of training, debates, workshops and lectures. Aim: achievement of the method by the faculty interested in making use of simulation in their teaching activities.
Factor 03	The Achievement	Structuring of own Simulation Center. Aim: Comply with all steps of the method with quality and effectiveness.
Factor 04	The Manager	Hiring a nurse to manage the internal administrative processes of the laboratory, considering that realistic simulation encompasses: strategies, processes and tools. Aim: Organizing an agenda for the use of space by the institutional teaching staff; Maintenance and custody of materials and mannequins; Prediction and provision of materials and mannequins; Assisting in the preparation of the simulation scenarios; Conducting the sound and filming processes of recorded scenes during the simulations; Storage and safekeeping of recorded contents; Assisting faculty in the debriefing stage.
Factor 05	The Monitor	Effect the participation of student monitors in the processes of conducting the method Aim: Disseminating institutional culture of monitoring; Assisting the simulation laboratory manager in administrative processes; Assisting the teaching staff in the simulation processes: scenario organization, exercising the role of "actor" during the scheduled simulations;
Factor 06	The Research	Involvement of teachers and students in the production of scientific research in the area of realistic simulation. Aim: Encourage the production of internal research on the subject; Encourage the student of nursing in scientific production; Maintain effective updates on the subject.

Source: Own authorship

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analysis about the realistic simulation method in the training of nurses as a critical and reflective professional.

It is considered that educational interventions based on simulation need to be modified for different contexts. Each institution that manifests the desire to implement the method must find the best way to adapt it to its reality, since the institutions follow different educational standards, and not always the successful experiences of this study will serve another institution.

It is emphasized that the teaching practice is permeated by multiple facets that contribute to the expected results: institutional characteristics, individual attitudes of the teacher, as well as the relationship between teachers and students. However, it is emphasized that it is a priority to have qualification and training conditions for the development of the realistic simulation method by the teaching staff, and for the teaching-learning process to be effective with regard to the undergraduate student's education.

It is recognized that there are still large gaps to be investigated about the method, and this leads us to the development of new approaches to simulation research. In this perspective, some questions that have not been contextualized in this study are suggested; however, it is believed the further studies are required. In the context of debriefing, the following questions can be asked: does the application of an expository lecture on the error committed by the volunteer shortly after debrienfing have implications for the retention of knowledge? Who learns most during debriefing: the student who only observes or the very participatory student?

When reflecting on the context of the teaching/learning process, using the realistic simulation method, the following investigative questions can be highlighted: When is the simulation to occur in the undergraduate nursing curriculum? How often should the simulation take place during graduation?

In this way, it is realized that the study and deepening of the active teaching methodologies, and especially the simulation and its interfaces in the training of the nurse, lead to a wide field of research and investigation.

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