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Evaluation of the Clinical Simulation for the Teaching-Learning of the Nursing Diagnostic Reasoning

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ABSTRACT

Introduction: Among the active methodologies, there stands out the realistic simulation, which, while nursing teaching tool, allows reproducing aspects of nursing care, in which the student is free to repeat the scene as many times as necessary to achieve full learning. Objective: To evaluate the clinical simulation as a strategy of teaching-learning of the nursing diagnostic reasoning through the debriefing

Methods: A cross-sectional study in a Public University in North eastern Brazil. The participants were forty-five students from the Nursing Undergraduate Course. Study developed at the laboratory of clinical simulation in the period from August to September 2019. Results: Five clinical scenarios were simulated. Concerning the overall reliability of the Debriefing Assessment Scale, the value of Cronbach's alpha, in this research, was 0.903. The overall mean agreement was 4.0 points, being higher for the cognitive (4.52), psychosocial (3.97) and affective (3.84) values.

Conclusion: Clinical simulation was considered an excellent strategy for the teaching-learning of nursing diagnostic reasoning, based on the high values of the items evaluated by nursing students. Simulated cases mediated by debriefing foster the construction of clinical, critical and applied reasoning.

INTRODUCTION

Clinical simulation is a teaching-learning strategy guided by theoretical models that enables students to experience simple or complex health situations in safe and controlled environments prior to real hospital or outpatient practices [1]. In nursing, the design of clinical simulation involves some characteristics. Of these, the debriefing is considered the key component of the strategy for stimulating students to critical, reflective and creative thinking [2]. During the debriefing, mistakes and successes are questioned, highlighted and valued by the facilitator allowing the student to assimilate and recreate their simulation in order to improve their skills for good nursing practices [3]. The construction of the debriefing involves creativity, constant self-assessment, active participation and effective guidance [4]. From this perspective, establishing Nursing Diagnoses (ND) requires critical thinking skills, logical reasoning, technical and scientific knowledge and clinical experience. For the learning of ND, reflective thinking of the student is necessary to make clinical judgment and this requires specific, cognitive and non-cognitive skills [5,6]. Thus, clinical simulation contributes to the improvement of cognitive skills for understanding and elaboration of ND by students allowing them to actively participate in their own teaching-learning process. The undisputed consequence of this process is the student's ability to recognize their failures and the achievement of results that favor their professional construction and the development of competencies, skills and attitudes to clinical reasoning in response to human needs [7-9]. The training of nursing professionals requires a process of continuous transformations and needs to evolve as a result of its historic importance. The Brazilian National Curricular Guidelines, which attribute mandatory Educational standards for Nursing higher education courses, established in November 2001, establish the integration of pedagogy of competencies (learning to learn, critical and reflective training), defending the student as a protagonist and the professor as a facilitator in the teaching-learning process, adopting new teaching proposals and strategies that foster the development of competences [10]. In this way, the undergraduate teaching in the health area has experienced a process of conceptual and methodological changes in detriment to the professional profile that the labor market demands from the graduate, in addition to the multidisciplinary collaborative engagement in the diagnostic decision-making [11,12]. The task of diagnosing, through the application of clinical judgment, requires from nurses a set of skills (cognitive, behavioral and mind habits) of critical and reflective thinking, logical reasoning, clinical experience and knowledge about the patient's conditions, based on the interaction between interpersonal, technical and intellectual processes [13-15]. For this purpose, in order to facilitate decision-making and standardize the language used among nurses in the formulation of the Nursing Diagnosis, there was the creation of the classification systems for nursing practice, particularly with the taxonomies of NANDA-I and the International Classification for Nursing Practice (ICNP®). In this perspective, nursing students and nurses may use those classification systems, taxonomies essential for the standardization of additional scientific and professional languages for the healthcare planning [16]. In this context relevant to the learning process, the active methodologies adjust to this need in training by being guided by the theoretical principle of autonomy. It is a student-centered teaching strategy and leads him/her to assume a professional attitude increasingly independent and active, seeking to achieve the learning in a protected, supportive environment with freedom [17]. Among the strategies of active methodologies, there stands out the realistic simulation, which, while nursing teaching tool, allows reproducing real aspects of nursing care routine, in which the student is free to repeat the scene as many times as necessary to achieve full learning, in a controlled environment and free of damages to the patient. It is a tool that awakens the curiosity and interest of the apprentice, facilitating his/her adaptation to the technique and provides the learner the development of independence, decision-making, leadership, communication and professional ethical skills [18,19]. Assuming the need to advance in knowledge about the nursing diagnoses and understanding the complexity that surrounds this learning, the tendency is to produce schemas, simulated cases and simulation scenarios. Several studies have been carried out worldwide on simulation in the learning of the nursing diagnosis reasoning [7,12], in particular, construction and validation of platforms and software [20,21] in order to make this practice more evident in education and attractive to students. The simulation-based education fills the gap in the theoretical-practical teaching model [20]. It is described as an innovative strategy and an ideal component in the learning process of nursing education, in addition to preparing students for professional practice and life. This pedagogical method is considered beneficial, effective and has shown positive results in several studies [22-24], indicating that the students felt more confident and expressed satisfaction after experiencing the simulation as a teaching method in the learning process. In the realistic simulation, the students, after accomplishing the scenario, participate in the debriefing, which allows discussing the case, exploring their emotions, identifying their thought processes, clinical judgment and nursing behaviors, under the professor's mediation [25]. During the debriefing, the student exercises the clinical reasoning in nursing, an essential element in the provision of qualified care. However, the development of this competence represents a challenge, because it sets up a process that involves students and professors within a network of elements that includes professor's training, financial resources, awareness and institutional support [26]. The simulation environment is believed to be a space to approach theoretical and practical knowledge of students, since it constitutes a tool that covers communication technology and informatics. Thus, developing studies that address the simulation scenarios for the teaching-learning process of the nursing diagnosis reasoning with emphasis on the NANDA-I diagnosis would contribute significantly to the diversity and strengthening of nursing researches. Furthermore, this approach stimulates and awakens in nursing undergraduate courses new projections and innovative and dynamic teaching strategies that will support the clinical performance and critical thinking of students with the use of clinical simulation in the learning of nursing diagnoses. Thus, the objective of this study is to evaluate the clinical simulation as a teaching-learning strategy of the nursing diagnosis reasoning through the debriefing.

RESEARCH METHODOLOGY

A cross-sectional study, with a quantitative approach, developed in the laboratory of clinical simulation of a government

university in northeastern Brazil, in the period from August to September 2019. The participants were 45 Nursing students enrolled in the last year of the course. The choice was defined because of the subject taught by the researchers. The inclusion criteria were: Nursing students enrolled in the seventh period, in the second half of 2019. There was exclusion of those who already had another graduation in the health area, considering that they could have some prior knowledge that favored their performance in simulation scenarios. Five scenarios were planned and developed by the researchers, tested and validated by nurses (experts). The idealization of scenarios met the premises of Jeffries (2015), which present as components: facilitators, participants, educational practices, characteristics of the simulation design (which includes the debriefing process) and simulation results. The guide used in the simulation practice was adapted from the one proposed "by Fabri [27] consisting of clinical situations with nursing diagnoses for each case. The clinical cases and the priority nursing diagnoses were validated by nursing experts for subsequent assessment of concordance with the diagnoses drawn by students in simulation activities. The terminology used for the preparation of nursing diagnoses was the NANDA International, version 2018-2020 [28]. Five clinical situations were chosen, namely: Nursing Care Systematization (NCS) in labor monitoring; NCS in breastfeeding; NCS of adolescents in situation of prevention of sexually transmitted infections; NCS in case of hypertension and diabetes and NCS in situation of climacteric. The choice of the themes addressed in clinical situations was guided by the importance of working with situations that embraced the life cycles and three levels of complexity of the Brazilian Unified Health System (UHS): Primary Care, Medium and High Complexity. The validation of simulation scenarios about the nursing clinical reasoning in women's health with their respective priority nursing diagnoses was performed in the period from May to July 2019, by specialist nurses, called experts. These were selected through choice on directories of research groups from the National Council for Scientific and Technological Development (CNPq in Portuguese). For this purpose, the method "of Lopes and Silva and Araújo [29] was adopted, which uses the binomial testing to compare proportions, with the division of the sample into two groups of specialists: nurses, professors who develop studies about nursing teaching strategies; and/or another group with specialists in nursing diagnoses, both with at least master's degree in Nursing. An item was considered adequate if defined by a certain number of evaluators, being the ideal proportion of 85% of acceptance among evaluators and a minimum of 70%. In this case, the required number was 22, considering the confidence index of 95% from the following calculation:

$$n=Z\alpha 2.P(1-P)/e2,$$

where P is the expected proportion of judges, representing the adequacy of each item and "e" the proportional difference acceptable in relation to what one would expect. The initial contact was made by e-mail, through an invitation letter sent to 56 expert nurses selected, containing information on the survey and deadlines for completing and returning the Informed Consent Form (ICF) and evaluation instrument. Only 25 agreed to participate in the validation. The 25 expert nurses judged the adequacy of each scenario, as well as the learning objectives, environment, problem description, information for dialog between nurse and patient, groups and nursing diagnoses inferred for each scenario, as well as their prioritization. In this evaluation, the opinions were measured as a 5-point Likert scale, in which 1- indicated the inadequacy of the scenario; 2- little appropriate; 3- somehow appropriate; 4- considerably appropriate; and 5- strongly appropriate [29]. After the analysis and judgment of each scenario proposed, the experts also assessed their accuracy through the Nursing Diagnosis Accuracy Scale (NDAS). The accuracy of a nursing diagnosis consists in the judgment of an evaluator regarding the degree of relevance, specificity and consistency of the clues for its occurrence [30]. The scenarios were conducted by the main author, who has expertise in simulation with proficiency in the debriefing, and by members of the research team properly trained. For each simulation meeting, students were divided into group with five members through a randomization process of teams, through the distribution of envelopes containing numbers. The simulations occurred in three stages: briefing, lasting an average of ten minutes, which presented the goals of the scenario; simulation experience (ten minutes), and the debriefing, which lasted on average 15 minutes, according to the needs of each team, headed by the main researcher. The data were collected at the end of the fifth meeting. For the evaluation of the five moments, the students answered the Simulation Debriefing Assessment Scale, which was constructed and validated for Portuguese [31]. Its reliability was measured, demonstrating the Cronbach alpha coefficient of 0.899. The scale contains 34 self-fulfillment items, 5-point Likert type: strongly disagree (1) disagree (2) neutral (3) agree (4), and strongly agree (5). For the analysis, the items can be assessed individually or in three dimensions, which include the "psychosocial value" – refers to the psychological and social aspects inherent to the simulation; "cognitive value" - assigns the consolidation of knowledge through discussion during the debriefing; and "affective value" - relates to the feelings or affections. The data were tabulated in Microsoft Excel® spreadsheet and analyzed descriptively, by absolute and relative frequency, in the Statistical Package for Social Sciences (SPSS®) version 22.0, and presented in tables. The study received approval from Human Research Ethics Committee of the Federal University of Rio Grande do Norte, Brazil with opinion number 1.967.840. All subjects signed an Informed Consent Form, respecting the Resolution 466/2012 of the National Health Council of Brazil.

RESULTS

In relation to the characterization of the study participants, 41 (91.11%) were female, 35 (77.7 were between 21 and 25 years old, 42 (93.33%) had family income between 596.00 and 799.23 dollar per month, 43 (95.55%) had no other graduation, 39 (86.66%) did not attend technical course in the heath area and 43 (95.55%) were attending the undergraduate subject of Women's Health Nursing for the first time. Concerning the overall reliability of the Debriefing Assessment Scale, the value of Cronbach's alpha coefficient was 0.903. The valued for the alpha for each dimension were 0.904 for the psychosocial value,

0.917 for cognitive value and 0.901 for the affective value. The overall mean concordance was 4.0 points, being higher for the cognitive value **(Table 1).** When assessing separately the items of the scale, for the psychosocial dimension, the students demonstrated a concordance of 100.0% in items 22, 23, 25, 26, 28, 32 and 33. For the cognitive dimension, the items 1, 3, 6, 8, 10 and 13 showed concordance of 100.0%. In the affective dimension, the items 9, 15, 20, 24, 31, 34 identified non-concordance of 100.0% **(Table 2).**

Table 1. Minimum, maximum values, mean and standard deviation of the debriefing factors. Natal, Rio Grande do Norte, Brazil, 2019. (n= 45).

Dimensions	Minimum	Maximum	Mean	Standard Deviation
Factor 1 – Psychosocial value	2.8	5	3.97	1.12
Factor 2 – Cognitive value	3.4	5	4.52	0.96
Factor 3 – Affective value	2.6	5	3.84	0.47

Table 2. Distributions of the items of the Debriefing Assessment Scale. Natal, Rio Grande do Norte, Brazil, 2019. (n=45)

Dimension	Items	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
		N	%	N	%	N	%	N	%	N	%
Psychosocial value	16 Increase my self-confidence	0	0	0	0	0	0	5	11.1	40	88.8
	17 Develop leadership competences	1	2.2	2	4.4	3	6.6	3	6.6	36	80
	19 Increase the power of teamwork	1	2.2	2	4.4	3	6.6	4	8.8	35	77.7
	21 Feel accomplished	0	0	1	2.2	2	4.4	4	8.8	38	84.4
	22 Strengthen my initiative in future situations	0	0	0	0	0	0	0	0	45	100
	23 Develop the relationship of help	0	0	0	0	0	0	0	0	45	100
	25 Strengthen my autonomy to act as a future nurse	0	0	0	0	0	0	0	0	45	100
	26 Identify difficulties in my action	0	0	0	0	0	0	0	0	45	100
	27 Promote the self-consistency (know one's own emotions)	1	2.2	2	4.4	3	6.6	3	6.6	36	80
	28 Feeling in the center of the training process	0	0	0	0	0	0	0	0	45	100
	30 Improve my ability to manage emotions	1	2.2	2	4.4	2	4.4	3	6.6	37	82.2
	32 Feeling proud of being able to execute several interventions correctly	0	0	0	0	0	0	0	0	45	100
	33 Feeling that the professor is actually interested in my professional development	0	0	0	0	0	0	0	0	45	100
Cognitive value	1 Structure my thinking	0	0	0	0	0	0	0	0	45	100
	3 Learn more	0	0	0	0	0	0	0	0	45	100
	4 Focus on the important aspects of the simulation	0	0	0	0	2	4.4	3	6.6	40	88.8
	6 Reflect on my competences	0	0	0	0	0	0	0	0	45	100
	8 Better identify the resources to use in the simulation	0	0	0	0	0	0	0	0	45	100
	10 Deepen the specific knowledge related to the simulation	0	0	0	0	0	0	0	0	45	100
	12 Identify aspects I should improve in future simulations	0	0	0	0	2	4.4	3	6.6	40	88.8
	13 Develop competences for right decision-making	0	0	0	0	0	0	0	0	45	100
Affective value	2 Feel embarrassed before my colleagues because of my mistakes	38	84.4	3	6.6	2	4.4	1	2.2	1	2.2
	5 Make me feel anxious/stressed	39	86.6	2	4.4	2	4.4	1	2.2	1	2.2
	9 Be humiliated before the others	45	100	0	0	0	0	0	0	0	0
	11 Be in panic when thinking of acting in another simulation again	38	84.4	2	4.4	2	4.4	2	0	1	2.2
	14 Create conflicts in the group	38	84.4	0	0	0	0	0	0	0	0
	15 Unwilling to participate in other simulations	45	100	0	0	0	0	0	0	0	0
	18 Feel misunderstood	39	86.6	2	4.4	2	4.4	1	2.2	1	2.2
	20 Feel disrespected	45	100	0	0	0	0	0	0	0	0
	24 Feel like a waste of time	45	100	0	0	0	0	0	0	0	0
	29 Be afraid of acting in future similar simulations	38	84.4	3	6.6	3	6.6	1	0	0	0
	31 Block my reasoning	45	100	0	0	0	0	0	0	0	0
	34 Messed ideas about the simulation	45	100	0	0	0	0	0	0	0	0

DISCUSSION

For an effective nursing diagnosis teaching, the teaching-learning environment should encourage the development of skills of students capable of giving a positive response towards the current demands of nursing practice and evaluations. Therefore, the realistic simulation with application of the debriefing is essential for developing skills such as the observation, critical thinking, reflective and logical reasoning, fundamental for the elaboration of the nursing diagnosis in clinical practice [32]. The Simulation Debriefing Assessment Scale, as well as the three dimensions related to competences established by the National Education Council and Board of Higher Education for Nursing Courses in the country [33], respectively, showed good internal consistency and reliability (Cronbach's alpha of 0.903), similar to that shown in the validation study of the scale [31]. The analysis of the psychosocial dimension demonstrated absolute concordance in items 22, 23, 25, 26, 28, 32 and 33. (22 Strengthen my initiative in future situations/23 Develop the relationship of help/25 Strengthen my autonomy to act as a future nurse/26 Identify difficulties in my performance/28 Feeling in the center of the training process /32 Feeling proud of being able to execute several interventions correctly /33 Feeling that the professor is actually interested in my professional development), corroborating the competences and skills of communication, leadership, management and administration and teamwork, according to national guidelines for Nursing undergraduate courses [33]. The results suggest that learning by simulation has a relationship with the students' confidence in their abilities, especially when there is encouragement from the professor to the learning process. They also highlight that professors favored the debriefing and self-reflection in order to promote the effectiveness of learning, fostering greater involvement of students in this process. This observation agrees with the results of a study led by Pai [34] which pointed out that educational outcomes have a strong relationship with the abilities of the professor to provide the most appropriate learning environment, drawing attention to the importance of nursing education institutions considering the professor's competence aiming to qualify the teaching-learning process. Also regarding the confidence of nursing students highlighted from the application of the simulation and debriefing in this research, the findings are similar to a systematic review on realistic simulation that demonstrated the efficacy of this educational model in the formative contribution [35]. Similarly, a randomized pre- post-test control study showed that nursing students from Portugal became more confident and safer after learning by realistic simulation, provoking thinking and acting together with significant self-confidence [31]. Referring to the psychosocial dimension, students verbalized the development of relationship of help during experience with realistic simulation through debriefing, demonstrating that this feature facilitates the development of skills relevant to the teamwork performance even before experiencing this aspect in the real environment of service. This result is consistent with a study in which the participants reported widely understanding the operation of an interprofessional teamwork, realizing the importance of collaboration between the members, in addition to developing skills in this perspective [27]. In the cognitive dimension, the concordance of 100% in items 1, 3, 6, 8, 10 and 13 (1 Structure my thinking/3 Learn more/6 Reflect on my competences/8 Better identify the resources to use in the simulation/10 Deepen the specific knowledge related to the simulation /13 Develop competences for right decision-making) is in accordance with the curricular guidelines in their competencies and skills of assertive decision-making [30]. In the analyzed context of teaching-learning of nursing diagnosis reasoning, the use of the resource of debriefing provoked motivation for learning, helping students acquire skills when facing difficulties, also revealing the stimulus to a more appropriate clinical decision-making. These issues were observed in another study with promising results in the students' learning after exposure to the environment of realistic simulation with the use of structured debriefing, generating better clinical judgment and critical thinking in students [18]. The development of those skills can be related to the debriefing nature, which is of essentially reflective character from discussions, leading to an actual knowledge acquisition. Learning to think to be able to act in human care requires listening, sensitivity and zeal, leading to transformational discussions and reflections for health training policies [29]. This dimension also allows the reflection of the indispensable recognition for action, i.e., the realization of critical thinking, leading to the ability to prioritize, plan and execute the actions [35]. In the affective dimension, there was non-concordance of 100.0% in items 9, 15, 20, 24, 31, 34 (9 Be humiliated before the others/15 Unwilling to participate in other simulations/20 Feel disrespected/24 Feel like a waste of time/31 Block my reasoning/ 34 Messed ideas about the simulation). This revealed the importance of a better understanding of the subjective dimension related to the teaching-learning aspect through the debriefing. In the debriefing, nursing students showed emotion, being of fundamental importance to understand this aspect that involves the learning process. The study "of Fisher and Oudshoorn [28] mentioned that the application of the debriefing does not happen isolated from emotion, which enhances the student's learning, allowing the participants to expose and understand their feelings in a controlled, respectful environment, contributing to an intense and meaningful learning. In this study, the debriefing unveiled that nursing students denied uncomfortable feelings related to the simulation in the teaching of nursing diagnosis, validating this learning tool as something positive and interesting. This result differs from those found in a study that explored the experiences of nursing students about the video-assisted debriefing after experiencing high-fidelity simulation, underlining that the participants presented a broad spectrum of emotions, since the reluctance related to resource, fear of judgment, until the fear of feeling personally attacked. Nonetheless, despite the presence of negative feelings, in general, the students agreed that the tool used allowed a good learning [34,35].

CONCLUSION

The clinical simulation was considered an excellent strategy for the teaching-learning process of nursing diagnosis reasoning, based on the high values of the items evaluated by nursing students. The skills and abilities involved in diagnostic reasoning are

intervening factors to determine the actions and decisions made at the different stages of the nursing process, with emphasis on the diagnosis and prescription. The methodological proposal of simulated cases mediated by debriefing fosters the construction of clinical, critical and applied reasoning, enabling the natural incorporation of nursing diagnoses in the health care routine. With the emerging profile, the clinical simulation approaches the theory and practice binomial in the context of the nursing student's training, narrowing the margins for the diagnostic language learning of human responses in a realistic way.

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