Original Article

TEXTO & CONTEXTO ENFERMAGEM
TEXT & CONTEXT NURSING TEXTO & CONTEXTO ENFERMERÍA

NURSING CONSULTATION FOR INSULIN USE: CONSTRUCTION AND VALIDITY OF A SIMULATION SCENARIO

Christian Nelson Schlosser[1]
Juliany Lino Gomes Silva[2]
Silmara Nunes Andrade[1]
Nelson Miguel Galindo Neto[3]
Flávia de Oliveira[1]
Maria Helena Melo Lima[2]
Danilo Donizetti Trevisan[1]

[1]Universidade Federal de São João del Rei, Programa de Pós-graduação em Enfermagem. Divinópolis, Minas Gerais, Brasil.
[2]Universidade Estadual de Campinas, Programa de Pós-graduação em Enfermagem. Campinas, São Paulo, Brasil.
[3]Instituto Federal de Educação, Ciência e Tecnologia de Pernambuco. Pesqueira, Pernambuco, Brasil.

ABSTRACT

Objective: To build and validate a clinical simulation scenario for teaching students about nursing consultations for people with type 2 Diabetes Mellitus in initial insulin use.
Method: A methodological study, carried out in a higher education institution in Minas Gerais, Brazil, between December 2021 and November 2022. The steps taken involved scenario construction, validity by 16 judges and scenario testing by 30 students. The conceptual model proposed by Jeffries and International Nursing Association for Clinical Simulation in Learning guidelines were followed to elaborate the scenario.
Results: The scenario was called “Nursing consultation for teaching initial insulin use to people with type 2 Diabetes Mellitus”. The scenario and the checklist for its validity were constructed, then, face and content validity was performed. The final validated version consisted of seven conceptual components (context, background, design, simulated experience, facilitator actions and educational strategy, participants and expected results). The overall value of the Content Validity Index was 0.98. High comprehensibility was noted by the target audience when testing the scenario.
Conclusion: The scenario obtained adequate validity and comprehensibility. Using this teaching tool can contribute to the training of future nurses regarding the consultation for patients using insulin.

DESCRIPTORS: Simulation Training. Insulin. Diabetes Mellitus, Type 2. Office Nursing. Validation Study.

HOW CITED: Schlosser CN, Silva JLG, Andrade SN, Galindo Neto NM, Oliveira F, Lima MHM, Trevisan DD. Nursing consultation for insulin use: construction and validity of a simulation scenario. Texto Contexto Enferm [Internet]. 2023 [cited YEAR MONTH DAY]; 32: e20230097. Available from: https://doi.org/10.1590/1980-265X-TCE-2023-0097en

CONSULTA DE ENFERMAGEM PARA O USO DE INSULINA: CONSTRUÇÃO E VALIDAÇÃO DE CENÁRIO DE SIMULAÇÃO

RESUMO

Objetivo: construir e validar um cenário de simulação clínica para o ensino de estudantes sobre consulta de enfermagem à pessoa com diabetes mellitus tipo 2 em uso inicial de insulina.
Método: Estudo metodológico, realizado em instituição de ensino superior de Minas Gerais, Brasil, entre os meses de dezembro de 2021 e novembro de 2022. As etapas percorridas envolveram construção do cenário, validação por 16 juízes e testagem do cenário por 30 estudantes. O modelo conceitual proposto por *Jeffries* e os guias da *International Nursing Association for Clinical Simulation in Learning* foram seguidos para elaboração do cenário.
Resultados: O cenário denominou-se "Consulta de enfermagem para o ensino do uso inicial de insulina à pessoa com Diabetes Mellitus tipo 2". Construiu-se o cenário e a lista de verificação para a sua validação; em seguida, realizou-se validação de face e conteúdo. A versão final validada foi constituída por sete componentes conceituais (contexto, background, design, experiência simulada, ações do facilitador e estratégia educacional, participantes e resultados esperados). O valor geral do índice de validade de conteúdo foi 0,98; notou-se alta compreensibilidade pelo público-alvo na testagem do cenário.
Conclusão: O cenário obteve adequada validade e compreensibilidade. A utilização desta ferramenta de ensino pode contribuir para a formação de futuros enfermeiros com relação à consulta para o paciente em uso de insulina.

DESCRITORES: Treinamento por simulação. Insulina. Diabetes mellitus tipo 2. Enfermagem de Consultório. Estudo de validação.

CONSULTA DE ENFERMERÍA PARA EL USO DE INSULINA: CONSTRUCCIÓN Y VALIDACIÓN DE UN ESCENARIO DE SIMULACIÓN

RESUMEN

Objetivo: Construir y validar un escenario de simulación clínica para enseñar a los estudiantes sobre consultas de enfermería para personas con diabetes mellitus tipo 2 que usan insulina por primera vez.
Método: Estudio metodológico, realizado en una institución de educación superior de Minas Gerais, Brasil, entre los meses de diciembre de 2021 y noviembre de 2022. Los pasos seguidos fueron la construcción del escenario, la validación por 16 jueces y la prueba del escenario por 30 estudiantes. Para la elaboración del escenario se siguió el modelo conceptual propuesto por Jeffries y las guías de la International Nursing Association for Clinical Simulation in Learning.
Resultados: El escenario se denominó "Consulta de Enfermería para la enseñanza del uso inicial de insulina a personas con Diabetes Mellitus Tipo 2". Se construyó el escenario y la lista de chequeo para su validación. Luego se realizó la validación facial y de contenido. La versión final validada constó de siete componentes conceptuales (contexto, background, design, experiencia simulada, acciones del facilitador y estrategia educativa, participantes y resultados esperados). El valor global del índice de validez de contenido fue de 0,98. El público objetivo notó una alta comprensibilidad al probar el escenario.
Conclusión: El escenario obtuvo adecuada validez y comprensibilidad. El uso de esta herramienta didáctica puede contribuir a la formación de los futuros enfermeros en cuanto a la consulta de pacientes usuarios de insulina.

DESCRIPTORES: Entrenamiento Simulado. Insulina. Diabetes Mellitus Tipo 2. Enfermería de Consulta. Estudio de Validación.

INTRODUCTION

Insulin is a medication commonly used by people with type 2 Diabetes Mellitus (2DM), since changes in lifestyle and/or oral antidiabetics have been insufficient for glycemic control and, consequently, not reaching the individualized glycemic goal of each patient[1].

However, several challenges are involved for people with 2DM to successfully manage their insulin compliance behavior, especially in the Brazilian Health System (SUS – *Sistema* Único *de Saúde*). The main aspects that contribute to such behavior involve physical factors (mainly those related to side effects and adverse reactions), knowledge and skills for administering insulin, self-monitoring of capillary blood glucose, need for meal planning, emotional factors, social factors, factors related to changes in daily life and, finally, general knowledge and personal beliefs about insulin[2].

Associated with these gaps, one can add the growing prevalence of diabetes, the health crisis arising from the current pandemic situation and the reductions in investment in public health, which will have an even greater impact on the care of people with diabetes in the future[3–4]. In this regard, professionals working in primary care services, including nurses, must be more and more prepared and qualified to act precisely in the behavioral changes of people with 2DM, including medication compliance and safe medication use[5–6].

Through nursing consultation, it is possible to encourage the autonomy of people with 2DM using insulin and, thus, empower them to become protagonists of their own care and decisions regarding their health condition. However, weaknesses can still be observed in the conduction of this light technology, probably related to undergraduate teaching. In this sense, clinical simulation has stood out among the pedagogical resources, since it is possible to reproduce real situations in controlled, safe environments capable of providing meaningful learning for students. It consists of three stages: providing learners with knowledge focused on simulation (preparation), clinical scenario execution (participation) and discussion/reflection on lived experience (debriefing)[7,8,9].

Studies report that simulated practices were able to provide significant learning, with increased clinical experience, performance in the assessment of knowledge, recognition of limitations, reaffirmation of a critical-reflective view of skills and self-confidence in relation to conventional practice[10–11]. Although its results are consecrated in the teaching-learning process, simulation for teaching the insulin use to people with 2DM is a recent topic and little explored by nurses, but, at the same time, with great potential as a resource for nursing consultation, aiming at safe handling of this drug[12–13].

Considering, therefore, the lack of a simulation scenario aimed at teaching students to carry out nursing consultation for people with 2DM in initial insulin use, focusing on the guidelinesregarding necessary materials, proper insulin preparation, administration, storage and transport, and safe handling, this study was developed to answer the following research question: which items should compose a clinical simulation scenario that can be used to teach students about carrying out nursing consultation for people with 2DM in initial insulin use? To answer this question, the study aimed to build and validate a clinical simulation scenario for teaching students about nursing consultation for people with 2DM in initial insulin use.

METHOD

This is a methodological study. The steps taken involved building the scenario, validity with a committee of experts and testing the scenario with the target audience. The Standards for Quality Improvement Reporting Excellence in Education (SQUIRE-EDU) guidelines were followed to guide this study[14]. Data collection took place at the Skills and Simulation Laboratory of a Higher Education Institution (HEI) located in the municipality of Divinópolis, Minas Gerais, Brazil, between December 2021 and November 2022.

Scenario construction was based on the Brazilian Society of Diabetes (SBD – *Sociedade Brasileira de Diabetes*) 2022 guidelines and on previous studies involving the theme[5–6,15]. Moreover, the International Nursing Association for Clinical Simulation and Learning (INACSL)[7] and the National League for Nursing Jeffries Simulation Theory[16] recommendations were followed. The authors carried out an exhaustive reading of the materials raised and, based on their academic experiences, built the scenario to contemplate all the fundamental elements that should subsidize and guide nurses during nursing consultations for people with 2DM at the beginning of insulin treatment. Learning objectives, educational practices, fidelity, problem solving, clues, briefing, debriefing and expected results were considered essential items. Thus, the material was subdivided into seven conceptual components, a checklist of actions expected by students and a script for the actors.

Content and face validity processes were carried out by a committee of experts to analyze scenario content and appearance representativeness. Nurses who met the following criteria were included[17]: being a master's or doctoral degree with expertise on the subject (diabetes mellitus, drug therapy with emphasis on insulin use or clinical simulation); having knowledge/skill acquired through at least one year of professional experience (care, teaching or research); having experience in the development of health technologies (articles published in the area of diabetes mellitus, insulin or clinical simulation).

The search for experts took place through the *Curriculum Lattes*, available on the Brazilian National Council for Scientific and Technological Development (CNPq – *Conselho Nacional de Desenvolvimento Científico e Tecnológico*) website with the insertion of the following terms: 2DM, insulin, clinical simulation, health technology and teaching-learning. For convenience, 39 professionals were invited, of which 23 did not return contact, resulting in a sample of 16 judges. To reach the sample size, a minimum number of six judges was considered as previously recommended, involving the elaboration of psychometric scales[18].

For data collection, participants received an invitation letter with the purpose of the study, the Informed Consent Form (ICF), the scenario in PDF, a sociodemographic characterization instrument (initials of judge's name, sex, age in full years, time since graduation, city where they work, title, current occupation, time since professional training, place of performance of professional activities, care and teaching experience with the theme and publication in the area) and an instrument for assessing the scenario items, adapted from a previous study[19]. The instrument consists of 23 items in which judges should assess the scenario using a five-point Likert-type scale ranging from "totally agree" to "totally disagree". The criteria for judging the instrument were objective, structure/presentation and relevance. The objective was composed of eight items that covered the purposes, goals or ends that one wanted to achieve with the scenario script. Structure and presentation were assessed using nine items aimed at the general scenario organization, structure, presentation strategy, coherence and formatting. Finally, relevance was assessed using six items, referring to the characteristics that assess the degree of significance of the scenario presented.

After validity by the committee of judges, the scenario was applied to a sample of nursing students to assess scenario understandability and adequacy. In this phase, nursing students enrolled in the sixth period, aged 18 years or older and who were available to answer the questionnaire in person, were included in this phase. This period was chosen because it is students' initial contact with content from the health area of adults and older adults, a subject addressed in the scenario of this study. The exclusion criterion was previous training or professional experience in related areas that would allow prior preparation in handling insulin use. A total of 30 students who met the inclusion criteria were included[20].

For data collection, participants were invited in person and those who agreed to participate in the study were invited to read and sign the ICF in two copies. Initially, participants attended an expository class with dialogue in a room at a predetermined time with the theme "Nursing consultation for people with 2DM in initial insulin use in primary care". They received reading materials, being instructed to participate in the scenario development in the week following the class.

In order for the simulated environment to be close to reality, a nursing office in a primary care unit was built using the following materials and equipment: syringes with fixed needles for insulin with 30UI, 50UI and 100UI; vials of NPH insulins; medical prescription, results of recent laboratory tests, users' medical record, alcohol container; cotton; sharps disposal box; and pen, table and three chairs. The estimated time for scenario execution was 30 minutes, with the collaboration of a standardized patient to interpret the person with 2DM, and two students inserted in the scenario to carry out consultation.

The other students participated as observers. Both the students performing care and the standardized patient were instructed about the scenario's objective, and had opportunities to clarify their doubts. The observers were grouped into small groups of a maximum of 12 people, and were instructed to complete the checklist of expected actions. After this stage, the previously validated scenario was developed. A professor, member of the research group, facilitated simulation. In conducting debriefing, the facilitator encouraged the group to think and reflect on the clinical case and ask questions and answers to participants.

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 21. To analyze item agreement, the Content Validity Index (CVI) was calculated by calculating the Item-Level Content Validity Index (I-CVI), which corresponds to the agreement of evaluators for each item of the instrument and to the overall CVI. The I-CVI was calculated by dividing the number of judges who strongly agreed or agreed with the item by the total number of judges. The overall CVI corresponds to the average of all I-CVI. The item that obtained an average equal to or greater than 0.80 was considered desired in validity[21]. A binomial test was performed to measure the proportion of agreement for each item among judges, for which a proportion of agreement equal to or greater than 85% and a significance level of 5% were considered.

To assess target audience comprehensibility, the cognitive interview technique was used[22]. It is a qualitative strategy that investigates the level of difficulty in understanding, the presence of ambiguities and misinterpretations of the validated material. The main researcher addressed the participants demonstrating that he was interested in hearing them about the experienced scenario. Then he conducted some questions to verify that the scenario was, in fact, understandable. The items assessed were: a) understanding of the questions (what did you think of this scenario performed? What is your opinion on the scenario's name, learning objectives, prior preparation, time to carry out the activities, didactic strategy and loyalty? What is your opinion on how to conduct the pre-briefing, briefing, scenario and debriefing? What do you think about the checklist questions?); b) memory

retrieval of relevant information (did you find it easy or difficult to conduct the scenario? Which points were the easiest, and which were the most challenging?); c) decision process: (could you answer if there was any action taken that generated ambiguity, was it difficult to interpret or misinterpreted? Would you like to suggest any changes?); d) response process: (today we validate a scenario for which theme? What were the main key points worked on?). This analysis was performed after the completion of all phases of simulation. Items considered difficult to understand by students were reformulated or excluded.

The study was approved by the Research Ethics Committee of the proposing institution and complied with the requirements of Resolution 466/2012 of the Brazilian National Health Council (CNS – *Conselho Nacional de Saúde*). All participants signed the ICF.

RESULTS

The scenario was called “Nursing consultation to teach initial insulin use to people with Type 2 Diabetes Mellitus”. Content and face validity were performed by 16 judges included in the study. All participants (100.0%) were nurses, with a mean age of 40.3 years (±6.7), and training time of 16.7 years (±6.8). The majority (81.25, n=13) consisted of doctors and professors from public institutions, and three judges (18.75%) were clinical nurses in primary care. The totality (100.0%) had a publication involving the theme.

The overall CVI in the face and content validity stage was 0.98. The binomial test showed statistical significance ($p<0.05$) in agreement equal to or greater than 0.85 among judges in all items assessed (Table 1).

Table 1 – Judges’ agreement regarding the simulated scenario items. Divinópolis, MG, Brazil, 2021-2022 (n=16)

Variables	n (%)*	I-CVI†
1. Objective		
1.1 Contents are consistent with the scenario	15 (93.75)	0.94
clinical simulation’s objective	16 (100)	1.00
1.2 Learning objectives are clear and concise	16 (100)	1.00
1.3 Scenario content facilitates critical thinking	16 (100)	1.00
1.4 The information presented is scientifically correct	15 (93.75)	0.94
1.6 The information presented in the scenario can adequately cover the content on insulin use	16 (100)	1.00
1.7 Information/content is important for the quality of care provided	16 (100)	1.00
1.8 The clinical simulation scenario’s objective invites and/or instigates to adopt behavioral changes and awaken students’ attitudes towards insulin use	16 (100)	1.00
2. Structure and presentation		
2.1 Scenario script is appropriate for nursing students	16 (100)	1.00
2.2 Language used is easy for students to understand	16 (100)	1.00
2.3 The scenario has an attractive visual that keeps students’ attention	16 (100)	1.00
2.4 Data are presented in a structured and objective manner	16 (100)	1.00
2.5 How the scenario is presented contributes to student learning	16 (100)	1.00
2.6 Contains evidence needed to promote insulin education	14 (87.5)	0.87
2.7 Contextual details provide clues based on desired outcomes	16 (100)	1.00

Table 1 – Cont.

Variables	n (%)*	I-CVI†
2. Structure and presentation		
2.8 Patient profile provides sufficient data to make a clinical judgment	16 (100)	1.00
2.9 Pages or sections are organized	16 (100)	1.00
3. Relevance		
3.1 Scenario script allows the transfer of knowledge and learning regarding insulin management	16 (100)	1.00
3.2 The theme portrays key aspects that must be reinforced	16 (100)	1.00
3.3 The model allows the transfer and generalization of learning to different contexts	16 (100)	1.00
3.4 Scenario script proposes construction of knowledge	15 (93.75)	0.94
3.5 Can be used by health professionals/or educators	15 (93.75)	0.94
3.6 The clinical simulation scenario in insulin management can circulate in the scientific community of the area	15 (93.75)	0.94

* Percentage of agreement on the item; † Item-Level Content Validity Index.

Only one round was necessary in the validity stage with judges, however, some judges made suggestions for improving the scenario (Chart 1). In the test with the target audience to verify comprehensibility (cognitive interview), 30 nursing students from the sixth period participated, with a mean age of 23.5 (±3.4). Through the cognitive interview, the students reported that it was possible to: *Learn the content and fix the subject even more* (Student 1); *There was a different dynamic in talking about the subject, more easily, bringing more preparation to work in primary care.* (Student 14)*; I found it interesting, but the case of briefing needs adjustment* (Student 8) (at this time, all participants were asked to contribute to improving this text); *The steps for administering insulin need to be broken down into more sentences in the checklist* (Student 15) (at this time, the contribution of all participants was again requested to improve the highlighted point) (Chart 1).

Chart 1 – Changes made to the scenario based on judges' and target audience's suggestions. Divinópolis, MG, Brazil,2021-2022.

Participants' suggestions	Changes performed
Committee of judges	
Objective	Include in the expected actions checklist: - Importance of aspirating insulin in a bright environment; - Knowledge of the syringe and the scale of measurement units; - Reinforce the importance of hand hygiene; - Advise that insulin is dispensed free of charge by the unified health system; - Include more information about the rotation; - Break down the disposal of needles and insulin bottles; - Reinforce the time (five to ten seconds) before removing the needle from the skin after application.
Structure and presentation	Include more line spacing to make the scenario easier to read.
Relevance	No suggestions

Chart 1 – Cont.

Participants' suggestions	**Changes performed**
Students (target audience)	
Item before the change	**Item after the change**
Based on this, together, you and the nursing intern should teach and guide Pedro regarding initial insulin use	Based on that, together, you and the nursing intern should teach and guide Mr. Pedro regarding initial insulin use. It should be noted that its objective will be to carry out nursing consultation for Mr. Pedro, in order to teach him how to use insulin correctly and safely, as previously presented in the objectives.
c. Explain the insulin absorption time at each application site, considering the factors that may interfere.	c. Explain the time of insulin's action depending on the type of insulin, application site and activities of daily living of users.
d. Plan the rotation of application sites considering the number of applications per day, activities of daily living, physical activity and other factors that may influence the speed of insulin absorption.	d. Plan the rotation of application sites considering the number of applications per day, activities of daily living and other factors that may influence insulin action.
e. Examine the application site and the size of the needle used to define whether or not to perform the subcutaneous fold.	e. Define whether or not to perform the subcutaneous fold, depending on the size of the needle and the site of insulin application.

Thus, the final version was composed of seven conceptual components, a checklist of expected actions and a script for actors with information for acting. In conceptual component 1, information is provided regarding the scenario's name, target audience, location for carrying out the simulated activity and purpose of simulation. It was considered that the skills lab environment favors scenario fidelity, providing the development of students' clinical reasoning and decision-making when faced with a person with 2DM in initial insulin use.

In component 2, there is information regarding the learning objective, which consists of carrying out nursing consultation for people with 2DM in initial insulin use, with emphasis on guidance on the necessary materials, preparation, storage, administration and the proper transport of insulin. To achieve this goal, students previously attended a theoretical class on insulin administration, considering the updated SBD guidelines, with a discussion in the classroom about the possible doubts raised by students after reading the material. The scenario was expected to take place in thirty minutes, and the standardized patient modality was used to provide more realism and fidelity to the service.

In component 3, the scenario design was presented, where it was defined that two volunteers could participate in the service and which materials and equipment should be available, such as syringes with fixed needles, NPH insulin bottle, test results, box for disposal of cutting drill, among others. Before students enter the service, the prebriefing was structured, considering the important elements to ensure participants' immersion in the scenario, which are providing the learning objectives, timing of each simulation session, guidance on the facilitator, participant, observer and standardized patient roles, establishment of a fictional contract and recognition of the elements present in a simulation room.

In debriefing, the Promoting Excellence and Reflective Learning in Simulation (PEARLS) model was considered and, to encourage reflection, in the reaction phase, participants' initial feelings in the scenario were considered, with questions related to their feelings and reactions. In the description phase, students were allowed to provide information and clarify facts experienced in the scenario. In

the analysis phase, the facilitator explored the case, considering aspects that performed positively and others that seemed challenging. Finally, in the summary preparation phase, students were asked to highlight two points experienced in simulation that could contribute to their clinical practice.

In conceptual component 4, it was defined that this simulated experience should prepare students to approach and guide users for initial insulin use, in order to promote compliance with drug treatment. In component 5, it was established that the facilitator should guide students during participation in the scenario and conduct debriefing.

Participant characteristics must be considered and are described in conceptual component[6], which considers previous experiences, the level of anxiety, participation in the preparatory activity for clinical simulation and students' motivation. In conceptual component 7, students are expected to acquire cognitive knowledge about insulin therapy, develop technical and non-technical skills related to communication with users and guidance on the application of insulin as well as personal satisfaction and self-confidence with simulation.

The expected actions checklist was formulated with 19 topics for observers to check the expected actions during simulation. From participants' introduction at the beginning of the service to the provision of guidance on the types of insulin, the devices that are used for its application, the technique and application sites, complications related to the procedure, the correct disposal of materials, storage and transport locations, among other information were considered. The script for the actors was intended to provide relevant information for actor training before participating in the scenario.

DISCUSSION

The Sustainable Development Goals (SDGs) widely encourage the reduction by 2030 of premature mortality due to chronic noncommunicable diseases (NCDs), including 2DM, through using various tools, such as media, social networks, government actions, health technologies, intervention programs and training of human resources. However, there is still a shortage of studies that used active methodologies, including clinical simulation, to disseminate this important goal in undergraduate nursing courses. According to studies carried out in Brazil, China and Norway, clinical simulation is a teaching strategy capable of increasing students' cognitive performance, stimulating self-confidence, providing satisfaction in learning and promoting health behaviors in people with NCDs[11–12–23].

Unprecedented, this scenario was created so that nursing students, in addition to training their technical and communication skills, encourage patients' self-care, helping them with the complex behavior of insulin administration with a focus on reducing barriers to insulin self-administration, providing greater knowledge, skill and security as well as contributing to mortality reduction. A study with the application of clinical simulation in this context corroborates that this strategy has a positive effect on the cynical performance of students in relation to the main aspects related to the care for patients with hyperglycemia[24].

For a successful clinical simulation, it is necessary to develop strategies that ensure that the learning objectives are achieved and that students develop the expected skills. Thus, carrying out activities in a clinical setting with well-defined and clear objectives reduces gaps, in practice, and enables students to perform better in care[19]. In this sense, during the validity stage, this clinical scenario obtained a satisfactory assessment and reliability, with an overall CVI of 0.98. Furthermore, based on the cognitive interview technique, the scenario was considered comprehensible by the target audience. The suggestions for improvement made by judges and the target audience contributed significantly to scenario suitability.

The first step in developing the scenario in this study was to determine the learning objective. These were based on Bloom's taxonomy, which establishes three learning domains: cognitive (knowledge), psychomotor (skills) and affective (attitudes)[25]. Moreover, the aim was to build a high-fidelity scenario compatible with the expected training level. To express realism, the scenario was built to represent a nursing office in primary care, as identified in other Brazilian studies, whose objective was to develop simulation in environments similar to those found in clinical practice[10–11–19].

The choice to use a simulated patient also contributed to the realism of the scenario and provided a safe and appropriate learning environment. The process of preparing the actor to act in simulation followed the Association of Standardized Patient Educators recommendations for good practices, which consists of an international organization that determines domains to ensure success in the application of this teaching strategy[26].

Prebriefing in this care setting for people with 2DM was structured to ensure students' psychological safety and reduce their anxiety about participating in the care setting. This is an essential step in clinical simulation and can determine students' performance on the teaching strategy and reflect on their learning outcomes[27–28]. Therefore, it is fundamental that this phase is well structured, with essential elements for its standardization and quality, such as guidance on resources available in the attendance room, definition of the objectives of simulation, each participant's roles, fiction contract, among others. These recommendations were followed in this study.

It is observed that the debriefing stage is fundamental for students' learning process. This is the final stage of simulated practice and represents a moment of exchange among those involved, as it allows learners to express their feelings and emotions. At this stage, professors have the role of facilitators, who will lead the reflection on students' performance, specifying the positive actions and which ones could be improved to conduct the service. In this study, the PEARLS debriefing model was used, as it is an adaptable and suitable structure for various groups of students and different clinical simulation scenarios. According to researchers from the United States and Canada, its four stages of structuring — reaction, description, analysis and summary — ensure that participants share and reflect on their mental model, allowing future change in their clinical practice[29].

Thus, clinical simulation use in nursing students' teaching process must be in line with the profile of undergraduate students able to provide quality care and act with a view to resolving real existing demands that, in accordance with the Brazilian National Curriculum Guidelines for undergraduate nursing courses, suggest the implementation of new methodologies with the association of theoretical and practical content[30]. The central objective should be to enable nursing students to build skills and safely offer care in clinical practice.

The construction of scenarios that address insulin self-administration will improve students' clinical judgment and will contribute to decision-making with problem solving, resulting in future nurses with the ability to communicate effectively and direct actions for patient and insulin use safety.

Despite the efforts to build a pedagogically structured scenario, a limitation is the fact that the scenario was designed according to the reality of care provided to people with 2DM being monitored in primary care. This entails the need for adaptations for use in teaching regarding other levels of care. The study's contributions are based on the opportunity to develop nursing students' technical, communication and clinical skills. The study can also contribute to the self-care of people with 2DM in initial insulin use who, when properly instructed, will be able to implement appropriate behaviors, improve knowledge and skills for safe insulin use and 2DM management.

CONCLUSION

The simulation scenario obtained adequate assessment and reliability, presenting an overall CVI of 0.98, and agreement equal to or greater than 0.85 among judges in all assessed items. It is noteworthy that using this teaching tool can contribute to the training of future nurses. In the end, considering nurses' professional autonomy in Primary Health Care, it is essential that undergraduate nursing courses prepare their students to act with skill, safety and confidence in caring for people with 2DM.

REFERENCES

1. Elsayed NA, Aleppo G, Aroda VR, Bannuru RR, Brown FM, Bruemmer D, et al. 1. Improving Care and Promoting Health in Populations: Standards of Care in Diabetes-2023. Diabetes Care [Internet]. 2023 [cited 2023 Mar 20];46 Suppl 1:S10-8. Available from: https://doi.org/10.2337/dc23-S001
2. Langerman C, Forbes A, Robert G. The experiences of insulin use among older people with Type 2 diabetes mellitus: A thematic synthesis. Prim Care Diabetes [Internet]. 2022 [cited 2023 Feb 20];16(5):614-26. Available from: https://doi.org/10.1016/j.pcd.2022.08.008
3. Muzy J, Campos M, Emmerick I, Avelar FG. Characterization of primary health care for patients with diabetes based on the PMAQ-AB. Cienc Saúde Coletiva [Internet]. 2022 [cited 2023 Mar 20];27(9):3583-603. Available from: https://doi.org/10.1590/1413-81232022279.17542021
4. Sun H, Saeedi P, Karuranga S, Pinkepank M, Ogurtsova K, Duncan BB, et al. IDF Diabetes Atlas: Global, regional and country-level diabetes prevalence estimates for 2021 and projections for 2045. Diabetes Res Clin Pract [Internet]. 2022 [cited 2023 Mar 20];183:109119. Available from: https://doi.org/10.1016/j.diabres.2021.109119
5. Moreira TR, Toledo LV, Colodette RM, Mendonça ET, Amaro MOF, Ayres LFA, et al. Factors related to the self-application of insulin in subjects with diabetes mellitus. Rev Gaúcha Enferm [Internet]. 2018 [cited 2023 Mar 20];39:e2017-66. Available from: https://doi.org/10.1590/1983-1447.2018.2017-0066
6. Castro PC, Ribeiro T da S, Faraoni AG, Matumoto S, Souza FB, Viana AL. Insulin self-application in adults with diabetes mellitus in the home context: Integrative review. REME Revista Min Enferm [Internet]. 2022 [cited 2023 Mar 20];26:e-1433. Available from: https://doi.org/10.35699/2316-9389.2022.38799
7. INACSL Standards Committee; Watts PI, McDermott DS, Alinier G, Charnetski M, Nawathe PA. Healthcare Simulation Standards of Best PracticeTM Simulation Design. Clin Simul Nurs [Internet]. 2021 [cited 2023 Mar 20];58:14-21. Available from: https://doi.org/10.1016/j.ecns.2021.08.009
8. Tyerman J, Luctkar-Flude M, Graham L, Coffey S, Olsen-Lynch E. A systematic review of health care presimulation preparation and briefing effectiveness. Clin Simul Nurs [Internet]. 2019 [cited 2023 Mar 20];27:12-25. Available from: https://doi.org/10.1016/j.ecns.2018.11.002
9. Brown DK, Wong AH, Ahmed RA. Evaluation of simulation debriefing methods with interprofessional learning. J Interprof Care [Internet]. 2018 [cited 2023 Mar 20];32(6):779-81. Available from: https://doi.org/10.1080/13561820.2018.1500451
10. Boostel R, Bortolato-Major C, Silva NO, Vilarinho JOV, Fontoura ACOB, Felix JVC. Contributions of clinical simulation versus conventional practice in a nursing laboratory in the first clinical experience. Esc Anna Nery [Internet]. 2021 [cited 2023 Mar 20];25(3):e20200301. Available from: https://doi.org/10.1590/2177-9465-EAN-2020-0301
11. Campanati FLS, Ribeiro LM, Silva ICR, Hermann PRS, Brasil GC, Carneiro KKG, et al. Clinical simulation as a Nursing Fundamentals teaching method: A quasi-experimental study. Rev

Bras Enferm [Internet]. 2021 [cited 2023 Mar 20];75(2):e20201155. Available from: https://doi.org/10.1590/0034-7167-2020-1155

12. Ji H, Chen R, Huang Y, Li W, Shi C, Zhou J. Effect of simulation education and case management on glycemic control in type 2 diabetes. Diabetes Metab Res Rev [Internet]. 2019 [cited 2023 Mar 20];35(3):e3112. Available from: https://doi.org/10.1002/dmrr.3112

13. Liang K, Xie Q, Nie J, Deng J. Study on the effect of education for insulin injection in diabetic patients with new simulation tools. Medicine (Baltimore) [Internet]. 2021 [cited 2023 Mar 20];100(14):e25424. Available from: https://doi.org/10.1097/MD.0000000000025424

14. Ogrinc G, Armstrong GE, Dolansky MA, Singh MK, Davies L. SQUIRE-EDU (Standards for QUality Improvement Reporting Excellence in Education): Publication Guidelines for Educational Improvement. Acad Med [Internet]. 2019 [cited 2023 Mar 20];94(10):1461-70. Available from: https://doi.org/10.1097/ACM.0000000000002750

15. Banca R, Marroni M, Oliveria M, Saparapani V, Pascali P, Oliveira S, et al. Técnicas de aplicação de insulina [Internet]. Diretriz Oficial da Sociedade Brasileira de Diabetes; 2022 [cited 2023 Mar 20]. Available from: https://diretriz.diabetes.org.br/praticas-seguras-para-preparo-e-aplicac%cc%a7a%cc%83o-de-insulina/

16. Jeffries PR. The NLN Jeffries simulation theory. 2nd ed. Wolters Kluwer; 2021.

17. Jasper MA. Expert: A discussion of the implications of the concept as used in nursing. J Adv Nurs [Internet]. 1994 [cited 2023 Mar 20];20(4):769-76. Available from: https://doi.org/10.1046/j.1365-2648.1994.20040769.x

18. Pasquali L. Principles of elaboration of psychological scales. Psiq Clin [Internet]. 1998 [cited 2023 Mar 20];25(5):206-23. Available from: http://server2.docfoc.us/uploads/Z2015/12/16/PeCYBcAFoe/c2ce0c8de8ed987fc41dba3efa1ad442.pdf

19. Andrade PON, Oliveira SC, Morais SCRV, Guedes TG, Melo GP, Linhares FMP. Validation of a clinical simulation setting in the management of postpartum haemorrhage. Rev Bras Enferm [Internet]. 2019 [cited 2023 Mar 20];72(3):624-31. Available from: https://doi.org/10.1590/0034-7167-2018-0065

20. Perneger TV, Courvoisier DS, Hudelson PM, Gayet-Ageron A. Sample size for pre-tests of questionnaires. Qual Life Res [Internet]. 2015 [cited 2023 Mar 20];24(1):147-51. Available from: https://doi.org/10.1007/s11136-014-0752-2

21. Polit DF, Beck CT. The content validity index: Are you sure you know what's being reported? Critique and recommendations. Res Nurs Heal [Internet]. 2006 [cited 2023 Mar 20];29(5):489-97. Available from: https://doi.org/10.1002/nur.20147

22. Willis G. Cognitive interviewing: A tool for improving questionnaire design [Internet]. Thousand Oaks, CA(US): Sage Publications; 2005 [cited 2023 Mar 20]. 335 p. Available from: https://us.sagepub.com/en-us/nam/cognitive-interviewing/book225856

23. Olaussen C, Heggdal K, Tvedt CR. Elements in scenario-based simulation associated with nursing students' self-confidence and satisfaction: A cross-sectional study. Nurs Open [Internet]. 2020 [cited 2023 Mar 20];7(1):170-9. Available from: https://doi.org/10.1002/nop2.375

24. Woda A, Hansen J, Dreifuerst KT, Anderson P, Hardy T, Garnier-Villarreal M. The impact of simulation on knowledge and performance gain regarding diabetic patient care. Clin Simul Nurs [Internet]. 2019 [cited 2023 Mar 20];34:16-21. Available from: https://doi.org/10.1016/j.ecns.2019.05.001

25. Kim BN, Myung JK. Analysis of knowledge in nursing management educational objectives based on Anderson's Revision of Bloom's Taxonomy. J Korean Acad Nurs Adm [Internet]. 2019 [cited 2023 Mar 20];25(3):198-207. Available from: https://doi.org/10.11111/jkana.2019.25.3.198

26. Lewis KL, Bohnert CA, Gammon WL, Hölzer H, Lyman L, Smith C, et al. The Association of Standardized Patient Educators (ASPE) Standards of Best Practice (SOBP). Adv Simul (London) [Internet]. 2017 [cited 2023 Mar 20];2:10. Available from: https://doi.org/10.1186/s41077-017-0043-4

27. Lecomte F, Jaffrelot M. Prebriefing and Briefing. In: Chiniara G, editor. Clinical simulation: Education, operations and engineering. 2nd ed. Academic Press; 2019. p. 471-82.

28. Lucena SKP, Freitas LS, Silva IP, Mesquita SKC, Sena JF, Oliveira ACS, et al. The effect of simulation on nursing students' knowledge about colostomy irrigation: A quasi-experimental study. Texto Contexto Enferm [Internet]. 2023 [cited 2023 Jul 5];32:e20230011. Available from: https://doi.org/10.1590/1980-265X-TCE-2023-0011en

29. Dubé MM, Reid J, Kaba A, Cheng A, Eppich W, Grant V, et al. PEARLS for systems integration: A modified PEARLS framework for debriefing systems-focused simulations. Simul Healthc [Internet]. 2019 [cited 2023 Mar 20];14(5):333-42. Available from: https://doi.org/10.1097/SIH.0000000000000381

30. Brasil. Conselho Nacional de Educação. Câmara de Educação Superior. Resolução CNE/CES no 3 de 7 de novembro de 2001. Institui Diretrizes Curriculares Nacionais do Curso de Graduação em Enfermagem [Internet]. Brasília, DF(BR): Diário Oficial da União; 9 nov. 2001 [cited 2023 Feb 26]. Seção 1, 6 p. Available from: http://portal.mec.gov.br/cne/arquivos/pdf/CES03.pdf

NOTES

ORIGIN OF THE ARTICLE

Article extracted from the dissertation -*Ensino do uso inicial de insulina à pessoa com Diabetes Mellitus tipo 2: desenvolvimento de cenario simulado*, presented to the Graduate Program in Nursing, *Universidade Federal de São João Del-Rei*, in 2023.

CONTRIBUTION OF AUTHORITY

Study design: Schlosser CN, Silva JLG, Trevisan DD.
Data collection: Schlosser CN.
Data analysis and interpretation: Schlosser CN, Silva JLG, Galindo Neto NM, Oliveira F, Lima MHM, Trevisan DD.
Discussion of results: Schlosser CN, Silva JLG, Galindo Neto NM, Oliveira F, Lima MHM, Andrade SN, Trevisan DD.
Writing and/or critical review of content: Silva JLG, Galindo Neto NM, Oliveira F, Lima MHM, Andrade SN, Trevisan DD.
Review and final approval of the final version: Silva JLG, Trevisan DD.

APPROVAL OF ETHICS COMMITTEE IN RESEARCH

Approved by the Research Ethics Committee of the *Universidade Federal de São João del-Rei*, Opinion 5.241.491, Certificate of Presentation for Ethical Consideration (CAAE – *Certificado de Apresentação para Apreciação* Ética) 53737521.7.0000.5545.

CONFLICT OF INTEREST

There is no conflict of interest.

EDITORS

Associated Editors: Luciara Fabiane Sebold, Maria Lígia Bellaguarda.
Editor-in-chief: Elisiane Lorenzini.

HISTORICAL

Received: May 02, 2023.
Approved: July 05, 2023.

CORRESPONDING AUTHOR

Danilo Donizetti Trevisan
ddtrevisan@ufsj.edu.br