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Realistic simulation in nursing education: Testing two scenario-based models

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Abstract

Aim: To evaluate students' self-perceived pedagogical outcomes when using a digital scenario-based tool compared to traditional scenarios printed on paper.

Design: This study used a within-subjects experiment.

Method: A digital platform for scenario development was developed, focusing on patients' regaining independence and returning home after an acute event. Students participated in two simulation activities, differing only in the type of scenario used and completed a questionnaire to evaluate their learning experience.

Results: Students considered that the new scenario template provided a clearer understanding of the situation under analysis, allowing them to recognize the focuses of attention to be prioritized when formulating the intervention plan.

No Patient or Public Contribution: A digital platform for a standardized process of scenario writing to help realistic simulation in nursing education is a novelty in this study and will likely contribute to substantial learning gains.

KEYWORDS
clinical education, simulation, technology

1 | INTRODUCTION

During their training, nursing students develop knowledge, skills and abilities to solve complex health problems. The purpose of realistic simulations is to allow students to experience situations in controlled environments and raise awareness of the profession's demands. When exposed to challenges, training techniques and problem-solving, students will be able to develop professional skills and cope with fears, anxieties and other negative feelings and stimulate their interest in a dynamic and integrative learning process (Batista et al., 2014; Cook et al., 2013; De Oliveira et al., 2018; Kelly et al., 2016; Kim et al., 2016; Motola et al., 2013; Negri et al., 2017; Padilha et al., 2018). Clinical simulation can use simulators, manikins, simulated patients and, whenever possible, a holistic and integrative approach to mirror the reality of healthcare settings.

Many authors consider clinical simulation an area of excellence that allows for the mobilization of knowledge, the development of skills, abilities and attitudes, empowering students in decision-making, problem-solving and creating integrative learning (Cook et al., 2013; Daley & Campbell, 2017; Kim et al., 2016; Martins et al., 2018; Moran et al., 2018; Roca et al., 2020; Silveira & Cogo, 2017; Simões et al., 2008; Theobald et al., 2021). Throughout the simulation process, students are expected to develop cognitive, instrumental, relational and critical-reflective competencies that

favour the development of a professional profile and identity, following the principles and values of the profession (Simões et al., 2008).

Learning through simulations is shown to be an effective method (Cooper et al., 2015; Jerônimo et al., 2018; Moran et al., 2018). A study by the National Council for State Boards of Nursing suggests that 50% of clinical practice internships can be replaced by simulated practice in nursing courses (Moran et al., 2018). The clinical context can never be excluded from student learning; however, it should be considered when basic skills have been previously developed. The less favourable aspects of the clinical simulation relate to being a more time-consuming process (Horsley et al., 2014) and the need for students to have previously mastered psychomotor skills necessary for delivering care (Bambini, 2016). Nevertheless, simulated practice is a crucial strategy for training students, ensuring a safe practice because it does not put patients at risk (Arthur et al., 2013; Kim et al., 2016; Martins et al., 2018). In addition to training specific skills, simulation is a pivotal technique for developing skills in relating data, excluding or identifying diagnoses, prescribing and assessing interventions, establishing critical judgements and making informed decisions (Abdullah et al., 2021).

The preparation of a clinical simulation is preceded by a few steps, the first involving the development of a scenario. A scenario is a carefully constructed storyline to promote learning for participants and observers (Alinier, 2011). A scenario should provide insight as close as possible to the feelings and emotions of real-life experiences in clinical settings. Scenarios can be modelled on real-life situations and include a sequence of learning activities involving complex decision-making, problem-solving strategies, intelligent reasoning and other cognitive skills (Alinier, 2011). A scenario reproduces a clinical situation to foster learning through best-practice simulation activities (INACSL Standards Committee, 2016). Thus, its construction should be an important milestone of the educator's activity in preparing the simulation, requiring intentional and systematic planning (Manns & Darrah, 2012; Rutherford-Hemming, 2015). A scenario should be aligned with the objectives and expected learning outcomes; provide a background situation or story with a realistic starting point to begin the structured activities, and integrate a progression, including a script to guide participants (INACSL Standards Committee, 2016). Despite the existing literature on how to create scenarios (Alinier, 2011; Bambini, 2016; Daley & Campbell, 2017; INACSL Standards Committee, 2016; Kaneko & Lopes, 2019; Kelly et al., 2016; Manns & Darrah, 2012; Moran et al., 2018; Waxman, 2010), the specificity and context of its application require an exercise of refined planning that ensures its reliability. The development of scenarios for realistic simulations is often time-consuming and the presence of standardized information can guide students to consider essential concepts when evaluating and planning nursing care. In the context of this study, it was understood that care is related to the process of collecting patient information through the assessment and physical examination to identify nursing diagnoses, establish expected outcomes and propose effective interventions. The simulation objective was that nurses could describe nursing care plans for patients with the inability to perform self-care and their caregivers, focusing on the process of a person regaining independence and returning home after an acute event rendering them dependent on daily life activities. This activity should include collecting information (assessment and physical examination), prioritizing nursing diagnoses and expected outcomes and proposal of interventions for their resolution.

Because a digital platform for creating scenarios was developed in a theoretical (Morales Morgado et al., 2013) emphasizing psychopedagogical, didactic-curricular, technical and functional aspects, this study was designed to evaluate students' self-perceived pedagogical outcomes of two different types of scenarios, one created by this digital platform and the traditional method with a patient's history printed on paper.

2 | MATERIAL AND METHODS

2.1 | Design

This study used a within-subjects experiment to evaluate students' self-perceived pedagogical outcomes through realistic simulation using two different types of scenarios.

2.2 | Setting

This study was developed in one public nursing school in Portugal, focusing on a second-year curricular unit of the nursing undergraduate degree (with 240 ECTS). This curricular unit addresses the person dependent on daily activities and their family caregivers. One of the curricular contents focuses on the person hospitalized after an acute event and who presents dependence on self-care activities (feeding, walking, grooming, bathing, toileting, taking medication, transferring, turning, lifting and dressing). Students learn how to assess and identify problems, plan, implement and evaluate a plan to prepare for the home return from the hospital, which may include the collaboration of a family caregiver. This curricular unit takes place before the students' clinical placement. In laboratory practices, learning is developed through realistic simulation with groups of ten students. Each simulation is created with students who volunteer to play the nurse, patient or caregiver role. In traditional scenarios prepared for these learning experiences, the patient's history is written on a page. However, an overload of information may hinder the students' overall comprehension. Also, students tend to overlook aspects that may be important. Another hindering factor is the difficulty in recognizing a set of data in the colleague playing the role of the patient, such as the physical impairment to perform self-care activities. These difficulties are explored in the debriefing, ensuring the discussion and recognition of the evidence that allows identifying nursing diagnoses, establishing objectives and a targeted intervention plan appropriate to the situation under analysis.

2.3 | Intervention: digital scenario-based tool

Following the suggestions of the students who attended this curricular unit, a group of eight teachers lecturing this curricular unit considered that the scenarios traditionally used to approach this topic should be reformulated and the information organized by specific themes.

If possible, it should include illustrative graphical elements that would visually help understand some information while supplemented by a "script" with guidelines on the development of the interaction.

We decided to develop a scenario-based tool with the collaboration of the computer engineering department of the Polytechnic Institute of Porto (Santos, 2020). The application allows the scenarios to be stored in a library, saved, edited and deleted. The student can view the scenarios on an electronic device through a link and save them as HyperText Markup Language (HTML) or Portable Document Format (PDF).

Based on the areas considered most relevant to nurses working in the recovery and/or adaptation of a person with impairment in daily life activities, the group of professors started by identifying the information usually provided in the scenarios. After that, classify it by topics concerning the patient (Table 1) and his/her caregiver (Table 2).

If the person receiving care is unable to perform daily activities and requires the help of a caregiver, it will be necessary to prepare the caregivers. Thus, it is necessary to assess a set of facilitating or hindering variables for the performance of the caregiver's role (Table 2).

The development process of the digital scenario-based tool was completed after the choice of illustrative symbols for the key concepts identified. The search for symbols was limited to the icons shown in Figure 1.

When creating a new scenario, all entries of the scenario-based tool are blank and the symbols are greyed out. The traffic light

TABLE 1 Matrix of the scenario information on the person with self-care activities impairment

Type of information	Rationale	Example
Type of scenario	Guides to an objective or a specific situation	Person to be discharged to a long-term care unit
Dependent person photo	Allows for a better insight into the recipient of care	
Summary of the situation that triggered dependency in self-care activities	This content was considered the information core of the traditional model scenarios	A month ago, Mrs Amelia suffered a fracture of her left femoral neck due to a fall at home. She underwent surgery for a total hip replacement. She is in long-term care for training in self-care activities. She is progressing favourably but still shows impairment in some self-care activities (specified below). Mrs Amélia is expected to be discharged next week
Difficulties and limitations in self-care activities	An infographic that quickly explains the dependence in self-care activities of the target person in the scenario will be desirable	Walks with crutches Needs help to wash and dress her lower body Feels insecure about performing activities of daily living when returning home
Sociodemographic data needed to understand the case	Allows a better insight into the recipient of care	72 years Basic schooling Residing in Porto Widow Living alone Retired
Personal background	Data that potentially have a direct connection with the case and/or guide to more tailored care	Diagnosed with Type 2 Diabetes Mellitus at 50 years of age. She is taking oral antidiabetic medicines
Cognitive capacity Spatial and temporal orientation Motor capacity Awareness of the situation Availability to learn Financial status	This information is needed to evaluate if the person can be independent or will need a caregiver and/or other assistance/support	(using infographics)
Self-care activities impairment	Visual depiction of the Self-care Dependency Evaluation Form (Parente et al., 2021)	(using infographics)
Additional data: Social support Family support Emotional profile	This type of information may be helpful in some scenarios. An infographics representation would probably help illustrate this information	She has a group of friends with whom she regularly interacts. She has only a 45-year-old daughter, a teacher, married, with three children, living relatively nearby. Amelia is a cheerful and communicative person

TABLE 2 Matrix of the scenario information on the caregiver

Type of information	Rationale	Example
Caregiver photo	Allows for a better insight into the recipient of care	
The person's general data	This information allows knowing the person	Mrs Augusta is a school executive board member and accompanies her children's daily extracurricular activities She has a good affective relationship and is very close to her mother She is concerned and asks how to help her mother when she returns home
Sociodemographic data	Allows to better understand the person providing care	45 years old Upper Secondary School Teacher Married 3 children aged 18, 14 and 8 years
Awareness of the situation Availability to provide care Self-efficacy Availability to learn Physical capacity (functional) Cognitive status Financial status Affective relationship	This information is necessary to evaluate if the person has facilitating characteristics to be a caregiver. If possible, this assessment will use infographics.	(using infographics)
Clues	Guide the simulation to the desired development	The patient will be discharged in 2 days Despite having a job, the patient's daughter was identified as a potential caregiver She was concerned about her mother and her recovery She seems unaware of her mother's limitations at this time

system was chosen to indicate the level of impairment, as such: no impairment (green), moderate impairment (yellow) or severe impairment (red) assessment. Colours were organized by columns, with green for the leftmost column, yellow for the middle column and red for the rightmost column. A system with three equal icons for each concept was chosen if students had difficulties distinguishing colours.

2.4 | Participants

All 128 students enrolled in the second-year curricular unit of the nursing undergraduate degree and regularly attending the curricular unit were invited to participate in the study.

2.5 | Procedures

Two simulation activities were carried out, after a demonstration of a typical approach in a theoretical-practical class. The first realistic simulation, performed with the traditional scenario, took place with volunteer students that played the role of patient, caregiver or nurse. This scenario was a paper printed without photos, iconography or organized information. The core information of the traditional scenario was limited to data on the clinical situation, relevant information on deficits, sociodemographic data and some other relevant information about the caregiver (Table 3).

In the second realistic simulation involving three other volunteers, the scenario used was created by the digital platform, with detailed information organized according to the pre-determined fields, photos and iconography. Additionally, the new scenario included creating separate patient and caregiver data (https://scenario-tool-en.web.app).

Both scenarios had a script with indications about the patient and caregiver's expected attitudes. For example, in the first scenario, the student playing the role of the patient was expected to show interest in his/her recovery and low health literacy. The activity for each realistic simulation lasted about 20 min, with 45 min for the debriefing, similar to the two methods. Following the traditional method, the first simulation exercise took place in the first part of

Concept	Icons	Description
Cognitive capacity		Brain
Orientation		Compass
Motor capacity		A vector representing a person walking
Awareness		Eye
Learning availability		A vector representing a person reading
Financial capacity		Euro symbol
Self-feeding		Apple
Walking		A vector representing a person walking
Grooming		Comb
Bathing		Shower
Using the toilet		Toilet
Medication		Pills
Self-transferring		Arrows indicating two-way movements
Self-turning		Arrows indicating a 180° movement
Self-lifting		Arrow indicating the pretended movement
Dressing		Sweat-shirt

FIGURE 1 List of symbols and descriptions used by the virtual assistant for the creation of scenarios

TABLE 3 Traditional scenario used

Scenario
Mrs Dulcineia, aged 70 years, widow, retired (former textile worker), has been admitted for 2 days in medium long-term care and rehabilitation unit with sequelae of ischemic stroke
The patient developed left hemiparesis and can actively mobilize the left lower limb but cannot lift it. The left upper limb lifts but without any resistance. She developed urinary urgency, homonymous hemianopia and unbalance. She is conscious and oriented but very sad and pessimistic. She cooperates whenever asked but cries frequently. She can only feed herself with her hand and perform some bodily hygiene activities, being totally dependent on the remaining self-care
She has a history of Diabetes, diagnosed 2 years ago and is taking oral antidiabetics. She has a BMI of 30 kg/m^2
She has two married daughters, one of whom lives in the same parish as her mother (identified as the future caregiver) and the other lives in Lisbon. She lives in a social housing estate and is good friends with a retired neighbour. The daughters visited their mother frequently since she was widowed

laboratory practice (lasting 3 h). The second simulation occurred in the second part of the laboratory practice with the same students and the digital scenario was projected on a screen.

2.6 | Material

After each realistic simulation, students were asked to complete a questionnaire to assess their self-perceived pedagogical outcomes.

This questionnaire developed by the present study's research team was submitted for content validity. A set of four teachers external to the study, scored each question of the questionnaire (4-Totally adequate; 3-Adequate, 2-Partially adequate and 1-Inadequate), using the Content Validity Index and the items that did not score 3 or 4 were removed. Therefore, a questionnaire with 27 questions was approved to assess the students' perceptions about the understanding of the clinical data (9 items), the influence of data on better performance in the simulation experience (6 items), critical thinking to understand the suggested interventions (6 items) and experiment

recognition of the learning process (6 items). Each question was assessed by an ordinal scale scored from 1–10, where 1 corresponds to the worst assessment (not recognizing that the aspect contributed to learning) and 10 to an excellent assessment. The questionnaire was a double-sided printed sheet of paper delivered to each student with scenario 1 (the traditional model) on the front and scenario 2 (experimental model) on the back, thus ensuring the data paired analysis and anonymity.

2.7 | Data analysis

IBM SPSS (27.0) was used for data analysis. Measures of descriptive statistics were used to analyse each variable, namely the mean, median and standard deviation. In addition, the paired *t*-test was used to explore the differences between the two clinical simulations. Also, Cronbach coefficient alpha was used for internal consistency reliability for each domain of the questionnaire.

2.8 | Ethical considerations

The study was integrated into the laboratory practices of the curricular unit. Students were informed, as usual, that participation in realistic simulation activities was voluntary, not part of any assessment activity, and that completing the scenario form was anonymous.

Students were informed, as usual, that participation in realistic simulation activities was voluntary and was not part of any assessment activity and that filling in the scenario assessment instrument was anonymous.

Students were asked to sign an informed consent form. The study was submitted and approved by the Ethics Committee of the higher education institution (ADHOC_665/2020 flow).

3 | RESULTS

Fifteen students showed no interest in completing the questionnaires, and 10 were considered null because of incomplete answers about the students' activities as a nurse. A total of 103 students completed the questionnaire.

Results of item analysis show that the simulation with the new scenario (experiment) obtained a higher score in all items. After analysing the item-by-item mean differences (Table 4), only 4 questions did not present mean differences with statistical significance; two in the dimension *Contribution for an enhanced simulation performance* (item 10 and item 11); and two in the dimension *Learning contribution* (item 22 and item 24). The remaining 23 questions showed statistically significant differences.

The questionnaire showed acceptable internal consistency values. Cronbach's alpha coefficient values presented in Table 5 depict the realistic simulation using the traditional method. The values obtained in the simulation with the new scenario using the scenario-based tool were very similar, demonstrating the good reliability of the instrument used.

In the construction of the dimensions of the questionnaire, 15 participants with missing data were eliminated. By analysing the mean differences by dimension, the *Learning contribution* through the experimental scenario received greater recognition and appreciation for learning. Understanding data and the intended interventions are the most valued aspects of the new scenario model, as illustrated in Table 5.

4 | DISCUSSION

Simulation through an artificial environment recreates a real situation to practice, learn, validate, test or develop an understanding of human systems or actions, with a high degree of interactivity and realism for participants (Abdullah et al., 2021; Arthur et al., 2013; Cook et al., 2013; Garbuio et al., 2016; Kim et al., 2016; Motola et al., 2013; Roca et al., 2020; Tinôco et al., 2021). As a didactic technique, clinical simulation requires basic skills from professors, namely the mastery of concepts, attitudes and procedures (Bautista & Bartos, 2021; INACSL Standards Committee, 2016), demanding rigorous and systematic planning although flexible (Rutherford-Hemming, 2015). To achieve the expected outcomes, realistic simulation design and development should consider criteria that facilitate the effectiveness of simulation-based experiences (Der Sahakian et al., 2017; INACSL Standards Committee, 2016), with especially relevant scenarios, so that the simulation results are coherent and appropriate.

This study aimed to evaluate students' self-perceived pedagogical outcomes through realistic simulation using two different types of scenarios to address the issue of the person with dependence on daily life activities and their family caregivers when preparing the return home after a critical event.

There is extended literature reporting the steps and methodologies to be used to create scenarios (Alinier, 2011; Manns & Darrah, 2012; Neves & Pazin-Filho, 2018; Rutherford-Hemming, 2015). However, the contexts where they are applied and the resources that clinical simulations use are so diverse, making it difficult to adapt and use scenarios that have already been validated in other settings.

The focus of this study was the clinical scenario, considered by the teaching team to be the element where clinical simulation experiences could be enhanced. Some studies that used computer-based scenarios for clinical teaching employed immersive simulation, virtual reality or mixed techniques (Elcokany et al., 2021; Padilha et al., 2019; Tseng et al., 2021). However, these methods differ from the type of simulation experience used in a realistic simulation, such as the present study. Dramatization is a strategy that has been used in simulation activities, associated with satisfaction, self-confidence, knowledge, empathy, realism, decreased anxiety level, comfort, communication, motivation, reflection skills, critical thinking and teamwork (Negri et al., 2017; Pilnick et al., 2018).

TABLE 4 Students' assessment about the two experienced simulations mean values and standard deviation

Item	Traditional scenario		Digital scenario		p
	Mn–Mx	M (SD)	Mn–Mx	M (SD)	
Understand the clinical data					
1. I consider that the information on this scenario is… (from insufficient to complete)	7–10	9.39 (0.79)	7–10	9.72 (0.66)	**
2. I consider that the information presented was… (from confuse to well organized)	5–10	8.95 (1.29)	5–10	9.43 (1.53)	***
3. For me, understanding the scenario was… (from very difficult to very easy)	7–10	9.06 (0.91)	7–10	9.49 (0.92)	***
4. It seemed that important data were missing in this scenario… (from totally agree to totally disagree)	5–10	8.99 (1.16)	5–10	9.55 (0.86)	***
5. I understood the patient's impairments… (from totally disagree to totally agree)	5–10	8.76 (1.09)	7–10	9.59 (0.69)	***
6. I understood the caregiver's condition… (from totally disagree to totally agree)	4–10	8.15 (1.52)	6–10	9.53 (0.88)	***
7. I understood the patient's personal characteristics… (from totally disagree to totally agree)	4–10	8.70 (1.31)	6–10	9.27 (1.04)	***
8. I understood the context in which the scenario took place… (from totally disagree to totally agree)	4–10	8.83 (1.50)	7–10	9.52 (0.79)	***
9. Overall, the scenario information was… (from very unclear to quite clear)	6–10	8.98 (0.95)	8–10	9.68 (0.62)	***
Data's contribution to enhanced simulation performance					
10. I understood the patient's perspective during dramatization… (from totally disagree to totally agree)	5–10	9.33 (0.88)	7–10	9.55 (0.66)	ns
11. I understood the caregiver's perspective during dramatization… (from totally disagree to totally agree)	5–10	9.32 (0.94)	7–10	9.36 (0.83)	ns
12. The information provided by the patient was important for understanding the reported case… (from totally disagree to totally agree)	3–10	9.06 (1.28)	8–10	9.39 (1.02)	***
13. The information provided by the caregiver was important for understanding the reported case… (from totally disagree to totally agree)	3–10	9.18 (1.22)	4–10	9.33 (1.08)	**
14. I felt comfortable during this experience… (from totally disagree to totally agree)	3–10	8.63 (1.66)	6–10	9.17 (1.07)	*
15. I felt stressed during this experience… (from totally agree to totally disagree)	2–10	8.06 (1.56)	5–10	8.72 (1.20)	***
Data's contribution to understanding the proposed interventions					
16. During the interaction, I kept forgetting details from the scenario… (from totally agree to totally disagree)	3–10	7.45 (1.38)	4–10	8.65 (1.37)	***
17. It was difficult for me to imagine my classmate as a patient… (from totally agree to totally disagree)	2–10	8.36 (1.54)	3–10	9.11 (1.45)	***
18. It was difficult for me to look at my classmate and imagine the caregiver… (from totally agree to totally disagree)	2–10	8.66 (1.49)	5–10	9.24 (0.98)	***
19. It was difficult for me to understand the diagnostic activities to be carried out… (from totally agree to totally disagree)	5–10	7.68 (1.28)	5–10	8.65 (1.09)	***
20. It was difficult for me to understand the expected activities… (from totally agree to totally disagree)	4–10	7.84 (1.37)	5–10	8.57 (1.22)	***
21. It was difficult for me to understand the more appropriate nursing interventions… (from totally agree to totally disagree)	3–10	7.74 (1.41)	5–10	8.66 (1.15)	***
Learning contribution					
22. This method has helped to better understand a clinical event… (from totally disagree to totally agree)	5–10	9.42 (1.01)	8–10	9.80 (0.51)	ns
23. This was a relevant experience to my learning process… (from totally disagree to totally agree)	6–10	9.64 (0.761)	7–10	9.82 (0.54)	*
24. This method was important to assimilate this subject-related theory… (from totally disagree to totally agree)	5–10	9.40 (0.94)	5–10	9.65 (0.85)	ns

TABLE 4 (Continued)

Item	Traditional scenario Mn–Mx	Traditional scenario M (SD)	Digital scenario Mn–Mx	Digital scenario M (SD)	p
25. This method has boosted my interest in this subject… (from totally disagree to totally agree)	2–10	9.16 (1.31)	6–10	9.42 (0.91)	***
26. This was a challenging experience… (from totally disagree to totally agree).	3–10	8.73 (1.44)	5–10	9.23 (0.99)	***
27. I believe it will help me deal with real and complex situations… (from totally disagree to totally agree)	2–10	9.41 (1.27)	6–10	9.66 (0.83)	**

Abbreviation: ns, not statistically significant.
*$p < 0.05$.; **$p < 0.001$.; ***$p < 0.0001$.

TABLE 5 Students' assessment about the two experienced simulations mean values, standard deviation, mean differences and paired t-test values

Method	No items	Cronbach alpha	Traditional M (SD)	Digital M (SD)	Mean differences (SD)	t (df)
Understand the clinical data	9	0.77	79.81 (6.10)	85.78 (5.52)	−5.97 (6.92)	8.101 (87)***
Data's contribution to enhanced simulation performance	6	0.72	53.57 (4.80)	55.51 (4.06)	−1.94 (4.36)	4.180 (87)***
Data's contribution to understanding the proposed interventions	6	0.81	47.74 (5.97)	52.88 (5.07)	−5.14 (6.60)	7.20 (87)***
Learning contribution	6	0.85	55.75 (5.50)	57.44 (3.70)	−1.69 (3.64)	4.37 (87)***
Total	27	0.88	236.88 (16.76)	251.61 (14.55)	−14.73 (15.49)	8.93 (87)***

***$p < 0.0001$.

Alongside the search for the best scientific evidence on the subject, the professors of the curricular unit created a strategy (nominal group technique) to propose changes to the model in use and increase the fidelity of the scenarios used in the approach to the subject.

Thus, creating a standardized process of developing scenarios through a digital tool was considered innovative and appropriate. The process involved analysing the most commonly used constructs in assessing people with self-care impairment and their caregivers and proposing a template with these concepts. For example, the ability/impairment to perform self-care activities was considered a common element in almost all scenarios. The self-care dependency evaluation form (Parente et al., 2021) is widely applied. This form assesses ten domains of basic self-care activities (feeding, walking, grooming, bathing, toileting, taking medication, transferring, turning, lifting and dressing); hence, these fields were adopted as part of the standardized scenarios template. By creating a visual system in which we quickly perceive the data for assessing the person's ability to perform these self-care activities, we are reducing the amount of written information and creating a mechanism for the student to quickly perceive and retain this information during the simulation activity.

Visual stimuli are essential to learning since they arouse interest and may also help students greater content retention. In addition, using vector images in the scenarios facilitates the memorization of key concepts that students should address in future real-life contexts and thus perform appropriate diagnostic activities and care planning.

The study provides an in-depth understanding of the students' self-perceived pedagogical outcomes using two different types of scenarios (traditional vs. digital). The paired data analysis eliminates biases, ensuring greater validity of the results. With the digital scenarios, students had a better understanding of the patient's needs and their caregivers, helping the recognition of the expected interventions and improving their performance. This result is similar to other studies that used ICT as a learning method (Arthur et al., 2013; Góes et al., 2014; Silveira & Cogo, 2017). The digital tool for scenario creation can be viewed as a resource that increases teaching productivity by saving and allowing the reformulation and reusing of scenarios. Furthermore, the student only needs an electronic device to access the link to the scenario. Thus, this method of scenario creation proves to be sustainable and ecologically friendly. Technological applications and digital tools are under development in nursing education and are a resource that brings added value to the teaching-learning process (Arthur et al., 2013; Góes et al., 2014; Silveira & Cogo, 2017). The use of technologies as a reinforcement to traditional teaching methods is a valid strategy, capable of change in students' attitudes with a focus on learning (Arthur et al., 2013; Elcokany et al., 2021; Padilha et al., 2018, 2019; Tseng et al., 2021).

4.1 | Study limitations and implications for practice

This study had some limitations. First, its specificity and context were limited to a curricular unit of a nursing degree in a higher education institution, hindering the generalizability of results. The testing of the scenario models was not blind, and students perceived which model was innovative, which may have influenced their

assessment. However, we believe that the reported experience may motivate others and guide them in using this approach in different contexts and themes. In addition, the assessment of the opinion of students who played a more active role in clinical simulations was not fully controlled. Students who participated more actively were more likely to express a positive attitude towards learning (Arthur et al., 2013); however, no evidence was found to corroborate this perception.

5 | CONCLUSION

Students found the new scenario model most favourable to their learning in the specific context of the curricular unit, such as assessing and planning patients' return home after hospitalization for an acute event. In addition, the present study contributed to a joint reflection of professors and a comprehensive insight into the adopted pedagogical methods. Therefore, we believe that the creation of the scenario-based tool has favoured an increasing alignment with the pedagogical guidelines for students.

Creating realistic simulation experiences for nursing students has been a growing focus of attention for nurse educators. This study offers an innovative approach through a digital platform for a standardized process of scenario writing to help realistic simulation in nursing teaching. This methodological approach can contribute to less time-consuming processes and provide learning experiences with greater fidelity by allowing the creation of scenarios that facilitate learning. Thus, the process outlined in this study provides solid bases for enabling adaptation to other contexts.

AUTHOR CONTRIBUTIONS

TM and MJL—study design conceptualization, data analysis and manuscript writing.

MRS, MJP, RMF, MFA, BS and CF—data collection, analysis and interpretation of data and manuscript writing. FS—engineering development. All authors provided feedback on the draft manuscript, made the manuscript revision and approved the final version.

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CONFLICT OF INTEREST

The authors declare no conflict of interest with respect to the research, authorship and/or publication of this article.

DATA AVAILABILITY STATEMENT

Data available on request from the authors.

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