




## Research Article

# The Use of Simulation in Nursing Education Programs: A Cross-Sectional Interuniversity Study

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**Background.** Simulation-based education has been incorporated into nursing curricula as an educational strategy. However, its implementation has not yet been standardized in different regions. **Purpose.** The aim of this study is to describe simulation-based education in the nursing curricula in Catalonia and Andorra. **Methods.** An exploratory cross-sectional study was conducted in 2019 in which 16 universities participated. **Results.** The median dedication to clinical simulation in the nursing studies was

287.5 hours, with variations between universities (ranging from 24 to 516 hours). The dedication for the low-medium fidelity simulation was 89.4 hours (SD  $\pm$  58.3) and 26 hours (SD  $\pm$  17) for the high-fidelity simulation. All the universities had qualified teaching staff and facilities. *Conclusions.* There is variability in the implementation and use of simulation-based education among universities. However, there is consensus on its usefulness in nursing curricula. To integrate simulation training into the nursing curriculum, it is necessary to establish convergent simulation standards in higher education.

## 1. Introduction

The nursing discipline must adapt to increasingly demanding, changing, and fragmented contexts. This implies acquiring a level of competence to assume the leadership of care, responding in line with the latest scientific knowledge and ensuring a high degree of quality and safety in decision-making and actions. From the perspective of professional development, nursing training programs must offer a solid guarantee of achieving learning results, which allows the exercise of all actions related to the profession [1].

The creation of the European Space for Higher Education (EHEA) transformed university education, introducing accessible undergraduate and postgraduate training pathways, leading to master's and doctoral degrees. This change was accompanied by the implementation of the European Credit Transfer and Accumulation System (ECTS), emphasizing innovative teaching methods and placing students at the core of the educational process [2].

According to European guidelines, the training of nursing professionals responsible for general care comprises 240 ECTS, equivalent to at least 4,600 hours of theoretical and practical education, indicating that clinical practice represents half the hours of the total of this education. Clinical training is a part of nurse education through which nurses develop as part of a team and in direct contact with a healthy or sick individual and/or community to organize, dispense, and evaluate the required comprehensive nursing care based on the knowledge, skills, and competencies that they have acquired [1].

The EHEA was also established to evaluate university system quality, with quality agencies playing a crucial role in continuous processes, including assessment, certification, and accreditation. In Spain, the CIN/2134/2008 regulation aims to align the curricula of bachelor's degree programs that qualify for the nursing profession. The goal is to establish consistent educational programs to ensure the acquisition of competencies and learning outcomes [3]. However, each university may differentiate itself in the way it is implemented, in addition to offering an exclusive optional itinerary [4]. Competency-based education and learning results bring clarity, precision, and transparency to curriculum design [5]. Learning environments are evolving towards outcome-based approaches, giving rise to more participatory teaching methods for their development.

In recent years, simulation has emerged as a pivotal methodology in nursing education, providing a controlled and immersive environment for learners to develop and refine clinical skills [6]. Clinical simulation aims to replicate real-world scenarios, fostering experiential learning while

mitigating potential risks associated with direct patient contact. Simulation fidelity, representing the degree of realism in a simulated environment, encompasses various levels [7]. These levels range from low to high fidelity, where low-fidelity simulations replicate basic elements of a scenario, often using simple models or task trainers. Moderate-fidelity simulations introduce more complexity, incorporating realistic features and interactions. High-fidelity simulations, on the other hand, strive to replicate real-world conditions as closely as possible, often involving sophisticated manikins and advanced technologies. Each fidelity level offers unique advantages, influencing the depth and authenticity of the learning experiences [8].

Simulation-based education (SBE) is an effective teaching method for developing technical and nontechnical skills such as decision-making, clinical judgment, communication, and teamwork in the field of health sciences [9]. In Spain, unlike in other countries [10], this method is not yet considered sufficient to replace student hours in clinical practice. However, it has opened a reflective dialogue on its advantages thanks to the growing support of existing scientific evidence and the current particular situation of practice environments [11]. From an academic management perspective, there is a lack of clinical practice placements in healthcare centers and, sometimes, the clinical environments do not favor student learning owing to various circumstances.

Clinical simulation allows for the representation of a real-life event in order to practice different nursing interventions according to the level of competency development and the specificities of each subject in the nursing program [12]. Gaba [13] defines it as a technique, not a technology, to replace or expand real experiences with guided experiences that lead to real-life situations. Furthermore, clinical simulation combined with critical reasoning and problem-solving-based teaching allows for the refinement and deep understanding of competencies [14]. In addition, sometimes the students' access to real patients is limited by ethical, social, administrative, and legal aspects.

SBE offers other advantages, including the ability to adapt the learning pace to each participant's rhythm, increase patient safety, reduce healthcare risks, foster participant's engagement and deliberate practice, and enable the repetition of simulations until the proposed learning outcomes are effectively consolidated [15]. Similarly, this method involves a high cost if acquiring the most sophisticated and technologically advanced materials and resources is necessary. In addition, a teaching team trained in this method and technical personnel are required to maximize its effectiveness.

SBE has been incorporated as an educational strategy into the nursing curriculum. The development of SBE over time in different degrees of nursing has been progressive and has experienced significant growth in the last six years [16].

In Spain, 56% of the university centers are equipped with specific facilities for clinical simulation [16]. However, the implementation of SBE has not been equal or standardized in these centers even though there is evidence of its impact and evaluation of methodological aspects [17]. Currently, there are no known national guidelines that guide such implementation.

According to Collins and Hewer [18], EHEA has been integrated differently into European curricula. This means that a consensus has not been reached and that each Spanish and Catalan universities assume their own decisions when establishing learning through SBE. Consequently, there is considerable variability in the integration and implementation of SBE across universities. For this reason, this study aims to describe how the SBE of the nursing curriculum is organized in Catalonia (an autonomous community of Spain) and Andorra and to identify the characteristics of its use and implementation.

Catalonia and Andorra serve as a representative case study, offering valuable insights into the challenges and successes of simulation methodologies in diverse educational settings. The nuanced exploration of these regions provides a foundation for extrapolating findings to a global context, thereby contributing to the broader discourse on effective nurse education strategies.

## 2. Materials and Methods

**2.1. Design and Sample.** This exploratory cross-sectional study was conducted during the second semester of 2019. This interuniversity research project was carried out in all universities (including the different campuses) of Catalonia and Andorra where the degree in nursing was held. The 16 participating universities were Tecnocampus (Universitat Pompeu Fabra), Andorra University, Rovira i Virgili University, University of Vic-Central of Catalonia, Campus Docent Sant Joan de Déu (University of Barcelona), Universitat Autònoma de Barcelona, Mar Nursing School of Parc de Salut Mar (Universitat Pompeu Fabra), University of Lleida, University School of Nursing and Occupational Therapy of Terrassa, University of Vic-Central University of Catalonia, University of Girona, University of Barcelona, School of Nursing Sant Pau (Universitat Autònoma de Barcelona), Universitat Ramon LLull, Escuela Universitaria de Enfermería Gimbernat (Universitat Autònoma de Barcelona), and Universitat Internacional de Catalunya.

**2.2. Data Collection Instrument.** The survey was designed and validated to collect data on (1) specific information related to the nursing simulation program, (2) specific information related to the simulation environment, and (3) expert opinion (Supplement 1).

The survey design and validation process were described in an exploratory study carried out internationally by Chabrera et al. [19].

**2.3. Data Collection.** Each participating university was asked to collect data with the participation of a key informant (i.e., an expert from the simulation field), who was also part of the Nursing Research Group in Simulation of Catalonia and Andorra (GRISCA).

The aim of the questionnaire was presented to the participants twice at different meetings of the research group. Initially, the survey was requested to be completed over eight weeks; however, this period was extended to complete the data collection. The collected data were sent to a single person to blind the universities and encourage data collection.

**2.4. Permissions.** Participation was voluntary, and full details were provided in the presentation of the study and invitation email.

All participants obtained approval from their university, from the Director or Dean of Nursing, to participate and agreed to include their data in the research.

Since the data collected for this study do not include information from individuals, it was not considered necessary to obtain Ethics Committee's approval. However, ethical principles and good research practices have been rigorously followed at all stages of the study.

**2.5. Data Analysis.** Quantitative survey data were emptied through a Jamovi database that included all participating universities. All data were analyzed independently by six of the authors in order to achieve consistency in the interpretation of the results. Qualitative data were hand coded and analyzed using a descriptive analysis [20, 21].

## 3. Results

All universities that teach the nursing curriculum in Catalonia and Andorra responded, of which 6 were public and 10 private. Within the private universities, there were 6 centers attached to public universities, 2 centers of a public university but privately managed, and 2 fully private universities. In addition, 2 participating universities had 2 or 3 different health campuses that reported the degree of implementation of the simulation.

**3.1. Simulation in Nursing Programs.** The level of simulation implementation across different centers was evidenced by the total number of simulation teaching hours offered in various programs, which ranged from 24 to 516 hours (Table 1).

The total number of hours dedicated to simulation included all activities that the student must undertake autonomously and/or with guidance, including autonomous work, self-study, blended classes, theoretical classes, and face-to-face classes. In general, in SBE programs, there was a median dedication of 246 hours, of which 118 are conducted face-to-face with students (Table 1).

Of the total hours that the students had face-to-face sessions, all centers, except 2 (public and private), dedicated hours to each simulation modality (Table 2).

TABLE 1: General information related to the nursing programs.

ID	Type of university	Total hours of simulation in the curriculum	Total hours spent face-to-face in simulation
1	Private	178	104
2a	Public	360	118
2b	Public	360	136
3	Private	425	170
4	Private	320	120.5
5	Private	303	125
6	Public	366	88
7	Private	287.5	239.5
8	Private	112	94
9	Private	125	90
10	Private	135	135
11	Public	66	35
12a	Public	300	114
12b	Public	300	120
12c	Public	300	120
13	Private	155	100
14	Public	42	42
15	Private	516	258
16	Public	24	24
Mean (SD)		246 (139)	118 (58.7)
Median		300	118
Minimum		24	24
Maximum		516	258

SD: standard deviation.

TABLE 2: Specific information related to simulation in the nursing programs at each participating university.

ID	Total hours spent face to face in simulation to train technical and nontechnical skills in low- or medium-fidelity simulations	Total hours spent face to face in simulation with high-fidelity simulation to train technical or nontechnical skills	Type of subjects that use simulation	Purpose of simulation
1	31	22	Basic, compulsory	Formative + evaluative
2a	80	38	Basic, compulsory	Formative + evaluative
2b	80	56	Basic, compulsory	Formative + evaluative
3	136	34	Compulsory, optional	Formative
4	76	44.5	Compulsory, optional	Formative + evaluative
5	98	27	Compulsory	Formative + evaluative
6	52	46	Compulsory	Formative + evaluative
7	177	62.5	Compulsory	Formative
8	72	22	Compulsory	Formative + evaluative
9	72	18	Compulsory	Formative + evaluative
10	120	15	Compulsory	Formative + evaluative
11	28	7	Compulsory	Formative + evaluative
12a	96	18	Compulsory	Formative
12b	96	24	Compulsory	Formative
12c	116	4	Compulsory	Formative
13	80	20	Compulsory	Formative + evaluative
14	30	12	Compulsory	Formative
15	258	0	Compulsory	Formative + evaluative
16	0	24	Compulsory	Formative
Mean (SD)	89.4 (58.3)	26 (17)		
Median	80	22		
Minimum	0	0		
Maximum	258	62.5		

SD: standard deviation.

The average dedication in hours of the centers was 89.4 hours (SD  $\pm$  58.3) to low-medium fidelity and 26 hours (SD  $\pm$  17) to high fidelity. It should be noted that the private

center that allocated the most hours to the simulation dedicated 258 hours to low-medium fidelity and did not dedicate any hours to the high-fidelity modality. In turn, the

public center that allocated the fewest hours to the simulation did not allocate any hours to low-medium fidelity but dedicated all its hours to high fidelity (22 hours). The center that dedicated more hours to high fidelity was a private center, with a dedication of 62.5 hours. This same center dedicated 177 hours to low-medium fidelity.

All participating universities used clinical simulation in their “compulsory” subjects (100%), while 2 universities (public and private) also used it in “basic” subjects (12.5%) and 2 other universities (public and private) included it in “optional” subjects (12.5%).

SBE was included in 100% of the training curricula. In addition, in 11 programs, this formative nature was complemented by an evaluative orientation.

**3.2. Simulation Environment.** Regarding resources, 100% of the universities had the facilities to conduct simulations (Table 3). Therefore, all universities had low-medium fidelity simulators. However, 13 centers (81.25%) had high-fidelity simulators, whereas 3 centers (18.75%) (2 private and 1 public) lacked these more advanced simulators.

Regarding the human resources for simulation in the universities, the average was 6.1 (SD  $\pm$  5.6) full-time professors and 11.9 (SD  $\pm$  9.4) part-time professors. In public universities, the average was 5.5 (SD  $\pm$  6.4) full-time professors and 14.1 (SD  $\pm$  11.9) part-time professors. By contrast, in private universities, faculty teams were composed of an average of 6.70 (SD  $\pm$  5.2) full-time professors and 10 (SD  $\pm$  6.5) part-time professors.

Faculty members require specific training to teach in simulation environments. In 15 centers (93.75%), the faculty had formal training, whereas in only one center (public), no faculty member possessed this training (6.25%). In 5 of the centers (31.25%), faculty training was exclusively formal, whereas in the other 11 centers, faculty training combined formal and nonformal education (68.75%).

Finally, the technician is a great support to the development of simulations. Of the 19 centers of the 16 universities, 9 (47.3%) had full-time technicians and 7 (36.9%) had part-time technicians. In addition, 5 centers had more than 1 technician, unlike 3 centers (15.8%) that did not have any.

**3.3. Expert Opinion.** From the qualitative analysis, 3 main categories and 10 secondary categories were derived. The main categories were the role of simulation in the nursing program, the limitations of simulation compared to clinical practice, and the role of high-fidelity simulation in nursing education (Table 4).

**3.3.1. Role of Simulation in the Nursing Curriculum.** The professors referred to 4 categories within the role of simulation in the nursing curriculum. First, they referred to the “security” provided by this methodology. They described this as a safe environment that facilitates learning from mistakes without fear of harming a real patient.

Second, they described “the relationship between theory and practice,” referring to how simulation, as a teaching activity, promotes the application of theoretical knowledge in simulated scenarios for problem solving and experiencing situations. It also allows for the identification of areas where students need improvement.

Third, the development of “technical and nontechnical skills” was identified. Simulation facilitates the practice of skills in a safe environment, promotes self-confidence and motivation to acquire competencies, and enhances learning quality.

Fourth, the professors confirmed that the clinical simulation environment favors the development of “critical thinking” and the importance it has for students to achieve the competencies and learning outcomes proposed in the nursing curriculum.

**3.3.2. Limitations in Clinical Simulation Compared to Clinical Practices.** The professors verified that clinical simulation has some limitations related to the resources necessary to carry it out, including human resources (teachers and technicians), materials (mannequins, hardware, and software), and the spaces required for the proper functioning of the teaching activity (specific facilities).

This was also indicated as a limitation in the proper application of the clinical simulation methodology, as it requires formal training to implement, ensure faculty competence, and achieve the learning objectives established in simulation scenarios.

In addition, difficulties were observed in achieving the essential level of “realism” necessary for the simulations. This could make it difficult for students to fully engage in the simulation and perform tasks as they would in a real clinical setting. Furthermore, professors highlighted the challenges in recreating the uncertainties present in real clinical situations.

**3.3.3. The Role of High-Fidelity Simulation in Nursing Education.** The teachers considered the role of high-fidelity simulation in mandatory clinical practice during the nursing curriculum.

They highlighted the importance of “safety” for both the patient and the student, with the student being a key element in ensuring safety. Safety is crucial because it optimizes student learning and builds confidence. As a result, students can practice clinical skills (technical) and nontechnical skills related to teamwork, leadership, and decision-making, among others, that promote the “acquisition of competencies.”

In conclusion, the faculty highlighted that high-fidelity simulation helps students achieve optimal preparation or approximation to face clinical practices, which are ultimately part of the real life of a nurse.

## 4. Discussion

The results demonstrated the integration of simulation into the nursing curricula of Catalonia and Andorra.

TABLE 3: Specific information related to each participating university's simulation environment.

ID	Availability of specific simulation spaces	Availability of low-medium fidelity simulator	Availability of high-fidelity simulator	Number of teachers participating in the simulation program	Do teachers have a simulation training background?	What kind of training?	Number of technicians working in simulations
1	Yes	Yes	No	Full time: 12 Part time: 12	Yes	F, NI	Full time: 1
2a	Yes	Yes	Yes	Full time: — Part time: 30	Yes	F, NI	Full time: 1
2b	Yes	Yes	Yes	Full time: — Part time: 30	Yes	F, NI	Full time: 1
3	Yes	Yes	Yes	Full time: 15 Part time: 1	Yes	F, NI	Part time: 1
4	Yes	Yes	Yes	Full time: 7 Part time: 8	Yes	F, NI	Full time: 2 Part time: 1
5	Yes	Yes	Yes	Full time: 5 Part time: 8	Yes	F, NI	Full time: 1 Part time: 1
6	Yes	Yes	Yes	Full time: 7 Part time: 3	Yes	F, NI	Part time: 4
7	Yes	Yes	Yes	Full time: 5 Part time: 8	Yes	F	Full time: 1
8	Yes	Yes	Yes	Full time: 13 Part time: 7	Yes	F, NI	Part time: 1
9	Yes	Yes	No	Full time: 7 Part time: 3	Yes	F	Part time: 1
10	Yes	Yes	Yes	Full time: — Part time: 12	Yes	F	Full time: 1 Part time: 1
11	Yes	Yes	Yes	Full time: 2 Part time: 25	Yes	F, NI	—
12a	Yes	Yes	No	Full time: 21 Part time: 3	Yes	NI	—
12b	Yes	Yes	Yes	Full time: 7 Part time: 15	Yes	F, NI	Part time: 1
12c	Yes	Yes	No	Full time: 6 Part time: 15	Yes	F, NI	Part time: 1
13	Yes	Yes	Yes	Full time: — Part time: 21	Yes	F	Part time: 2
14	Yes	Yes	Yes	Full time: 4 Part time: 6	Yes	F	Full time: 1
15	Yes	Yes	Yes	Full time: 3 Part time: 20	Yes	F, NI	Full time: 1 Part time: 1
16	Yes	Yes	Yes	Full time: 3 Part time: —	Yes	F, NI	—

F: formal training (certified courses, master program, etc.). NI: nonformal or informal (learning from experience and self-learning).

TABLE 4: Analysis of expert opinion.

Main categories	Secondary categories	Exemplary responses of participants
Role of simulation in the nursing curriculum	Security	P4: "The student can learn from the mistake without repercussions for anyone" P15: "The simulation allows students to practice in a safe environment. Make mistakes and learn from your mistakes" P2: "Give a complementary and added value to the theoretical studies" P12: "It gives them a picture of their capabilities and how they are in terms of theoretical and practical knowledge, and what are the things they need to strengthen"
	Relationship between theory and practice	P5: "Methodology that allows you to work on technical and nontechnical skills, as well as teamwork, leadership, critical thinking, and decision-making" P10: "Technical skills training. Reflection on action" P6: "It is essential to develop critical thinking and reflective practice during nursing studies"
	Technical and nontechnical skills	P10: "Training transversal competences with leadership, decision-making, teamwork, and critical thinking"
	Critical thinking	P1: "Economic and material needs" P5: "High economic and human resource cost, as well as the limitation in time and academic schedules to double the groups" P1: "Methodological limitations in the application of the simulation. More formal training is required" P5: "Lack of scientific evidence to support the implementation of this methodology to work on specific skills" P2: "Sometimes, it is challenging for students to immerse themselves in their roles as if it were real life" P9: "It can be difficult to simulate the uncertainty of real clinical situations, where there is an unpredictable element that is beyond all control and is related to the reactions, motivations, and emotions of individuals"
	Resources	P4: "A safe approach for the student where they can learn from their mistakes" P10: "It is about safety, both for the student and the patient. Subsequent debriefing promotes critical thinking and reflection on action and creates a culture where errors are a source of learning and not a punitive space" P1: "Teamwork and autonomy skills" P12: "Also, teamwork and empowering toward decision-making using critical thinking.. so that the student can make decisions" P3: "It allows them to approach reality" P9: "Allows training and getting in touch with situations that the student is likely to encounter in real practice"
Limitations in simulation compared to clinical practices	Methodology	
	Reality	
The role of high-fidelity simulation in nursing education	Security	
	Acquisition of skills	
	Approach to reality	

To date, research in this field has indicated that outside of clinical practice, learning in a simulated environment provides a safe and effective way to support knowledge acquisition and improve evidence-based direct care [8, 22] by reducing the theory-practice gap [12].

In addition, it allows students to practice basic nursing skills in a safe environment from the beginning of the program before entering practical learning environments [23]. Furthermore, it allows students to practice basic nursing skills in a safe environment from the beginning of the program before entering practical learning environments.

Nursing curricula also include situations and aspects of clinical practice in which it is difficult to generate previous experiences owing to workload or situations that may not arise during the student's clinical training [24]. This depends on the place and time in which these practices are conducted, or in which, if they occur, the student is a mere observer without the opportunity to practice decision-making and learn from mistakes as a prerequisite for professional practice [25].

All universities in Catalonia and Andorra have integrated clinical simulation into their curricula to a greater or lesser extent. However, there is considerable diversity in the number of hours, type of subjects, degree of simulation, and purpose of the simulation. Unlike other countries such as Australia [26], no regulation in Catalonia standardizes the implementation of clinical simulation beyond the requirement that this training must take place outside of clinical practice hours. This situation differs from that of the United Kingdom (UK), where the Nursing and Midwifery Council (NMC) prescribes standards for prelicensure nursing programmes. In their 2009 policy, 300 hours of the required 2,300 hours (13%) of clinical practice can be replaced with simulation practice. In a review undertaken in June 2017, the NMC proposed that simulation could be used for up to half of the 2,300 practice hours required to register as a nurse. Recently revised standards simply state that educational institutions must "ensure technology and simulation-based learning opportunities are used effectively and proportionately to support learning and assessment" [27, 28]. In the UK, as in other countries such as Croatia and Poland, for example, the set of national educational standards for simulation allows each university a certain degree of flexibility in program design and implementation [29]. However, in Spain, the national agency responsible for university quality prohibits the integration of educational simulation as part of clinical practice hours to ensure compliance with the corresponding European Union Directive. Instead, universities should incorporate simulations into the theoretical subjects of training programs.

In recent decades, SBE in nursing training has experienced a notable increase with the creation of basic skills laboratories and the progressive creation of simulation centers. In this sense, all universities in Catalonia and Andorra have facilities specifically dedicated to simulation. Although simulations can be conducted in simulation centers both within and outside universities offering nursing programs, none of the participating universities reported the use of simulations in real clinical settings. However, this

possibility should be explored in the future to bridge the gap between academic and clinical environments.

Qualified faculty members are essential to deliver teaching in simulation environments and ensure the quality of SBE. SBE requires teachers with specific training in simulation and relevant experience in this area [30]. However, in our context, there is no specific program available to train faculty in simulation, unlike Australia, which has standardized it at the national level [31]. The training of teachers or instructors in clinical simulation has evolved in recent years, moving from an informal approach to formal, regulated approaches. In this sense, all participating centers, except one, reported formal training of their teaching teams, and all of them had extensive experience.

Currently, good-practice standards are defined for simulation-based programs [32]. Some programs aim to facilitate the acquisition of basic nursing skills, whereas others focus on developing advanced skills. According to the findings of this study, simulation in nursing programs aims to offer a safe environment for students that facilitates error-based learning and the integration of theory and practice, thus developing technical and nontechnical skills with special emphasis on clinical reasoning skills [33].

These standards serve as a reference not only for instructor training but also for the strategic planning of simulation centers and the development of research projects [34]. In most nursing programs of the participating universities (10 out of 16), there is a focus on promoting the innovation of simulated learning in the development of research projects funded by public or private sources. This commitment goes beyond the interest of each center and is intrinsic to the participating teachers, the proof of which is the interuniversity collaboration among the 16 universities with the creation of the research group GRISCA. In addition, this study provides information on the similarities and differences in the implementation of simulation in the nursing curricula of all universities in Catalonia and Andorra, as well as the available resources to encourage future research.

*4.1. Limitations and Areas for Further Research.* The data presented in this study correspond to the year 2019 and have changed since then. Delays in publication are attributed to the complexities of data collection and unanticipated disruptions caused by the SARS-CoV-2 pandemic, which prioritized specific projects and redirected researchers' attention. Considering the dynamic nature of educational programs and the continually advancing landscape of simulation methodologies, it would be interesting to conduct medium- and long-term follow-up to observe the evolution of simulation in the educational programs of all centers in Catalonia and Andorra. These subsequent investigations will enable us to capture the ongoing evolution of simulation within educational programs across the region.

In contrast, the qualitative data collected reflected the experiences, perspectives, and life contexts of only one participant per center. Therefore, this information cannot be considered representative of simulation experts in a generalized manner.



Given the growing evidence on the effectiveness of simulation centers, it is essential to establish guidelines for nursing educators and national agencies to integrate simulation as a formal part of the nursing curriculum. This entails defining the standards for the instructors, the time required, and the objectives of the simulation, always allowing flexibility in the design to achieve the proposed learning results and avoid cognitive overload according to the group of students and adaptation of the implementation in the centers. These guidelines will help establish synergies and collaborations between universities and healthcare institutions to build simulation educational resources, following the research priorities in clinical simulation and learning established by the International Association of Nursing [35].

## 5. Conclusions

The results showed that there is a consensus on the usefulness of simulation in nursing education programs in Catalonia and Andorra. However, there is significant variability in the implementation and use of simulation training among universities within the same territory. To integrate simulation training into the nursing curriculum, it is necessary to establish simulation standards from a global perspective in higher education systems in a convergent manner. Therefore, all stakeholders must invest in the development of simulation training programs and commit to conducting high-quality research to evaluate initiatives that contribute to strengthening the evidence in this field.

## Data Availability

The data used to support the findings of this study are included within the article and are available upon request from the corresponding author.

## Conflicts of Interest

The authors declare that they have no conflicts of interest.

## Authors' Contributions

Chabrera C has designed the research project and guided the data collection and analysis and participated in the drafting and significant revising of the paper. Data were collected by all authors and made a significant revision. Rodriguez E has provided an important contribution to the construction of the content of the paper and made review significant revisions.

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## Supplementary Materials

Data collection questionnaire used in the study. (*Supplementary Materials*)

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