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Pedagogical experience in implementing a Standardized Simulated Patient strategy for physical therapy reasoning

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Abstract

Background: There are various pedagogical tools that seek to develop the skills of health care students, among which simulated patients have been largely developed. This type of strategy helps nurture the processes of pedagogical innovation in universities and facilitates training the skills of physical therapy students. The objective of this article is to present the results of implementing the standardized simulated patient learning strategy based on the experience of students, actors and drama professors

Methods: A qualitative analysis of the content of the information obtained during the implementation was performed. An activity was designed, which included preparing volunteer students to act, who were trained to represent previously structured clinical cases in a complex simulation scenario organized at the simulation laboratory of the School of Medicine and Health Science of Universidad del Rosario.

Results: Forty-two students enrolled in the clinical reasoning course of the physical therapy undergraduate program participated in the project. They were organized into four groups for the clinical interview and examination by systems of the simulated patients, according to a clinical case. At the end of each simulation, students participated in the debriefing and were subsequently invited to a discussion group to assess the strategy with the actors and professors of the acting school.

Conclusions: This strategy allowed students to experience meeting and interacting with patients, collect data and perform the examination by systems. They jointly practiced their communication skills, team work, metacognition and emotional management. The standardized simulated patient strategy is a pedagogical option highly valued by students. It helps them develop cognitive, psychomotor and attitudinal skills in a protected environment. It is important to offer adequate briefing to favor managing the emotions generated by the simulated environment and to end with a debriefing to analyze students' performance within the scenario and identify positive aspects to be improved.

Background

Learning in the field of health care implies developing professional competencies and skills. Training for them has changed throughout the years, and new techniques have been ventured into to favor learning and practicing skills. Among these new techniques is simulation, which develops real situations in a safe, controlled environment and facilitates experimentation, learning by trial and error and reflection. It also favors students acquiring skills and knowledge that enrich their professional growth.

The simulation that has been used for decades to help acquire and assess skills, is a pedagogical practice that has gained strength in previous years for training professionals in various fields, among which are healthcare professionals. Simulation can be performed through different modalities, using advanced simulators with robotic technology and software to anatomical models, standardized patients and use of dramatization (1).

One of the advantages of simulation is that it allows recreating real life situations, which provides students moments for reflection with respect to their interactions. Four important components of simulation are described in the review by Pazin and Romano (2): exposure, sequence, feedback and repetition. Exposure represents the introduction to the problem and is also known as briefing. It refers to the guidance provided to participants before beginning the activity. The sequence refers to the level of complexity of the session to consolidate knowledge. Feedback enables exchanging knowledge between the student and professor, who is the active observer guiding the learning process. Finally, is repetition, which allows practicing the obtained knowledge and consolidating it (3).

Dramatization is a theatrical representation of a particular topic that allows the content that will be taught to be presented in a meaningful context, similar to the actual experiences students may have in a real context. In dramatization, conceptual and practical aspects are flexibly integrated according to pedagogical needs and requirements (4).

Dramatization includes activities, such as role playing, standardized patients and methods that include both modalities. The clinical reasoning course in the Physical Therapy program is responsible for learning decision-making and critical thinking. In this course, different strategies and activities are used to achieve the specific learning objectives and acquire skills for clinical interview, initial examination and evaluation and preparing medical records. These activities include role playing between students, in which untrained representations of clinical situations and health conditions are performed. These seek to exemplify cases that lead to acquiring the required skills and abilities, perceiving different perspectives of behaviors according to the students' roles.

In the follow-up and feedback for the experience of approaching a first real patient, it has been identified that these preparatory activities are not sufficient. Professors report and students recognize difficulties, such as fear, frustration, confusion, lack of empathy, an inability to organize and process data and difficulty solving small problems when facing real cases.

On the other hand, a standardized patient "is an individual trained to coherently and precisely represent a concrete disease or health problem, in order to teach and assess interpersonal and clinical skills" (5) related to professional reasoning, communication skills and physical availability. A standardized patient represents the case designed by professors with the required physical characteristics, body language, verbal communication and adaptations. Actors are trained in standardized cases and assume the role of user or companion to offer students an environment similar to real life. It provides them the opportunity to explore their fears, skills and opportunities to learn with a simulated patient, in a safe environment (6). The trained individual must not have a relationship with the students or course, in order to improve the reality of the situation.

Training actors, as well as the physical environment or set design, are indispensable for the authenticity, validity and quality of the clinical encounter. They must be extremely similar to the reality students will experience in the next stage of their education (4). In a revision of fifty-three articles by Negri and cols (7),

they highlighted some of the benefits students and professors perceive from simulated practice through dramatization: satisfaction, self-confidence, knowledge, empathy, realism, reduction of anxiety, comfort, communication, motivation, capacity for reflection, critical thinking and teamwork.

Taking into consideration these pedagogical reflections, we developed an environment learning project on the basis of dramatized clinical simulation. This article aims to present the results of implementing the Standardized Simulated Patient (SSP) learning strategy based on the experience of students, actors and drama professors.

Methods

The evaluation of Standardized Simulated Patient (SSP) learning strategy was carried out based on a phenomenological qualitative approach. All professors have experience in implementing clinical simulation as pedagogical strategy with students at undergraduate level . Students were invited to participate voluntarily in both activity and the interview. Qualitative data was collected from the students, actors, and drama teachers perceptions in a semi structured interview. The information obtained from the qualitative techniques was transcribed, digitized and coded based on the categories previously defined by the authors according to the aim of the evaluation. For analysis and triangulation the Atlas.ti Version. 8.0, qualitative processing tool was used. Two professors analyzed the information in an independent way for describing and interpreting participants' lived experiences, then they synthesize the findings.

The learning strategy with SSP was implemented in three phases, which are described below:

1. Design Phase: In this phase, ten cases were written, taking into account the different clinical domains of professional practice in physical therapy. The cases included anamnesis, medical records, reasons for consultation, sociodemographic and family aspects, expectations and needs, the chronology of the pathology, which includes the chronologically organized health history, and other clinical tests. Subsequently, the cases were validated and adjusted taking into account the structure, technical language and complexity of the staging, in cases of out-patient health care and hospitalization. The classification allowed establishing the specific training of actors and requirements for personifying the user and companion in some cases, as well as the stage design, clothing and make-up. The design phase included:

1.1 Call for actors: an open invitation was sent by e-mail and social networks to all the university's students, in order to recruit those interested in participating as actors in the clinical simulation group.

Once the call was finalized, training sessions were begun with a reputed acting school. The sessions involved: body language exercises, improvisation and personification based on the scripts of clinical cases. The first sessions addressed the ten presented cases, and five cases were selected according to a casting to identify individual acting capacities. One of the cases was for the pilot test and the remaining cases were for definitive implementation.

1.2 Preparation: A website with clinical records was created to develop the pilot test, and the set design and simulation environment material was structured (physical therapy cards, personal protection equipment and batteries and instruments for the physical therapy exam).

1.3 Pilot test: A pilot test was carried out with a single clinical case in which students from an intermediate semester and professors participated. The students read the medical record and performed the interview and systems review, in accordance with the plan for the pedagogical session. Subsequent to the activity, feedback was obtained from the participants: actors, students and professors, with which opportunities for improvement were detected and the corresponding adjustments were established.

2. Execution phase: The strategy was carried out, adjusted according to the results obtained from the pilot test. Students from the physical therapy reasoning course were invited to voluntarily participate in the pedagogical session. The medical record of the case was available to all the students. It was previously prepared through an interface of the clinical record software similar to the real one. In addition, the actors represented the case within a set design of outpatient consultation and hospitalization, in the simulation center of the School of Medicine and Health Sciences (SMHS). This phase was organized as follows:

2.1 Preparation**:** sessions to prepare actors were held once a week for seven weeks. They included training in body language, concentration, improvisation and the specific characterization, according to the case.

2.2 Implementation**:** The students were organized by work teams. Each team was assigned a simulated patient case to review their clinical record and proceed with the interview and examination. Students were not previously informed that the activity was simulated. Once the experience ended, a debriefing was performed with a checklist that was previously validated by the professors.

3. Evaluation phase: The participants in the strategy (actors, students and professors) were voluntarily linked to discussion groups, in order to assess their perceptions from their experience with respect to the learning environment and strategy as a tool for learning. Recordings of the discussion groups were transcribed in order to make a content analysis. The videos obtained during implementation were analyzed to observe logistical aspects of the environment.

Results

Based on each aspect of the learning strategy implementation, categories of analysis were previously established. The results are presented according to these categories and some emerging during the analysis: learning path, achievement of learning outcomes, scenario and performance, as can be seen in Table 1.

Table 1
Categories for qualitative analysis of SSP learning strategy

Analytical categories	Operational definition
Learning pathway	The learning pathway is a project developed by students in company of their teacher, in a learning environment built with different resources and training materials, allowing to meet the defined learning outcomes.
Debriefing	Debriefing or feedback is an indispensable part of the complex simulation strategy, since it allows reflecting on the exercise, skills demonstrated by the student, their emotions, communication and teamwork.
Scenario	This refers to the conditions of physical space and scenography where the pedagogical interactions of the SSP strategy take place.
Performance	It refers to the way students and actors assumed their role within the scenario and the credibility of the SSP. It is how they integrate, interact and engage in their role.

1. Learning Pathway

It refers to the way an educational strategy is organized and planned, as well as the steps students must take to achieve a learning objective. The results of the learning path are presented from the perspective of students, actors (simulated patients and companions) and professors (acting school). The learning pathway is analyzed from three components which are briefing, cases and clinical history and Expected Learning Outcomes.

Briefing:

The physical therapy reasoning course provides students the necessary tools to create thought processes that facilitate professional decision-making. The course articulates the previously acquired knowledge to be used in analyzing human body movement.

The students were able to show that, according to their level of education, they had the capacity to perform a structured and assertive interview on users and/or family members to obtain the necessary information to analyze the case. Students expressed that preparation with simulated scenarios must be carried out in semesters prior to interactions in the clinical practice. This would help them face similar situations in the future.

ES4: I consider we are prepared for an evaluation by systems review because it is only a survey… the education we have received until now helps us understand what we must ask and what we are asking."

ES4: "The education we have received until now helps us understand what we are asking and what we expect the patient to answer.
Cases and Clinical Record:

The students, actors and professors from the acting school were questioned regarding the pertinence of the simulated cases and clinical records to carry out the interview and systems review, in accordance with the objective of the pedagogical strategy. Furthermore, it was discussed how these elements favor generating hypotheses based on the perception and reading of the clinical record, as described in the person-centered clinical reasoning.

It was found that students consider that the dramatized cases for this pedagogical exercise motivated the interview and allowed them to practice their communication, data collection and deductive thinking skills. Moreover, it was found that students valued the way the electronic clinical records of the case were presented in the scenario, similar to what would happen in healthcare services.

ES2: "The clinical record was good. It had the information we needed to know, it was well organized, and I thought it was good to do it that way."

Est 3: "...I thought it worked really well! I could know how to guide the questions I wanted to ask to the patient. So I would say it was really helpful."
With respect to the complexity of the dramatized cases and the various elements that comprised them, the students stated how the information and characterization of the patient created opportunities to perform deductive reasoning and analyze clinical information, signs, symptoms and physiopathological characteristics they hope to be able to continue practicing before their clinical practices.

ES3: "I went in there and heard the patient start coughing. So, dang! Why did they start coughing?"

ES1: "If we could put what we learned during the semester into practice every semester, and when the moment comes, such as in sixth or seventh semester when things are truly more practical we could be more prepared.
On the other hand, professors from the acting school highlight how clinical cases and their complexity contribute to developing students' skills and bring them face to face with possible situations they may have to address in the near future in their professional practice.

EscAc 1: "Students are allowed to approach a situation that will be very similar to their reality in the near future."

EscAc 2: "It helps students approach the most common cases of their daily lives."
Expected Learning Outcomes:

Expected learning outcomes (ELO) (8, 9) represent the learning and achievements professors establish as educational purposes, in accordance with a curricular plan. They are expected to be obtained with the planned learning path.

In the physical therapy reasoning course, students acquire knowledge that they will subsequently use in more advanced semesters for professional practice. In that context, clinical reasoning and decision-making based on evidence allow providing an intervention according to each situation.

The learning environment and simulated patient strategy prepared for this project sought to achieve different ELOs of the course. Students' perceptions of their experience with the simulated patient, according to the different ELOs linked to this strategy, are presented in Table 2.

Table 2
Perception of Expected Learning Outcomes

ELO	OUTCOME
Carrying out an assertive interview with users and/or family members	The skill to express oneself in a kind, direct and appropriate manner is considered a part of an assertive interview. Students stated that the variable of time is a challenge for them to acquire this skill. In addition, they consider it important to learn how to organize questions for it to facilitate interacting with users and understanding the data they are collecting, in order to redirect the interview. *ES 3: I feel like it isn't so much about not having the time. Rather, in practice they can tell you how many patients you have, and you have to decide how to distribute your time* *ES 3: To be able to perform an interview in that time, checking everything you need to check.* *ES5: Not having a guiding thread during the interview with the patient, which is what we expect the patient to answer.* *ES3: Comparing the information in the record, what the patient told us and what his wife told us.*
Establishing open communication based on trust and professionalism with peers, patients/customers, and other professionals in academic and clinical spaces.	ES6: "in my case, I think I get tangled up talking, so the simulated patient makes me realize that I have many faults when I express myself." ES1: "I feel that it is easier to talk with a person who has less academic background than with one who does, because... one can omit explaining in a very technical way and do so in a simpler manner...".
Integrating the consequences of physiopathological processes in the physical qualities of an individual, and their effects on functionality.	ES 5: "he has COPD and one says, 'Wow! Now what do I do?' And when you get there and see the patient, that is when you know how to start developing the case. Even if you get prepared and decide to do this or that, you don't know what you're up against until you get there and see the patient." ES3: "Well, I realized it wasn't real because the patient had COPD, I tested their oxygen level and their saturation was 97%."
Developing hypotheses based on the analysis of biological, personal and contextual variables.	The scope of this complex simulation does not include making a hypothesis. Instead, it includes identifying the elements that lead to formulating a hypothesis. Students demonstrate basic knowledge that allows them to build premises based on various elements related to the patient's record or their signs, symptoms and characteristics. ES4: The education we have received until now helps us understand what we are asking and what we expect the patient to answer. ES3: "What medication they are taking can be very important information to know what pathologies they have and how they are being controlled." Furthermore, they value having a previously prepared health history, but also being able to collect information themselves to understand the user's situation. Est 5 "...It was in the history, but having the history and making the history at the same time was important, because the case could be different than what the patient said..."

Table 2. Perception of Expected Learning Outcomes (please paste here Table 2.)

As an additional finding from analyzing the interviews with participating students, the metacognitive process was found as an emerging category, which helped them reflect on verbal and non-verbal communication skills, relationship strategies, problem-solving and listening skills. These are necessary for proper performance in light of a clinical situation.

ES6: "If one projects confidence towards a patient, the patient feels safe by themselves and with the professional treating them."

ES3: "Therefore, managing nervousness and body management are not only about academic knowledge, but other external things."

2. Debriefing

Debriefing or feedback is an indispensable part of the complex simulation strategy, since it allows reflecting on the exercise, skills demonstrated by the student, their emotions, communication and teamwork. (10, 11). Moreover, it allows analyzing mistakes, since they are considered to become an opportunity for teaching, learning and continuous improvement.

The debriefing in this complex simulation was led by the professors and students in their last semester, who reflected with the group of students based on a previously developed and content-validated checklist. It included aspects related to the technical skills and abilities that had to be put into practice to perform the interview and systems review on the simulated patient.

In the discussion groups with students, it was observed that the debriefing was received positively. The debriefing allowed them to self-assess their performance and reflect on the different aspects that came up in the scenario. Because of this space, they recognized they could improve with respect to interviewing patients in aspects, such as: collecting sociodemographic data, confirming data from clinical records and managing their emotions.

Est 1. "One cannot entirely rely on the clinical record. Even if it is written there, you have to ask the question."

Students valued feedback from their professors, since they did not recognize the sufficiency or experience of their peers who were in their last semesters. Another aspect they highlighted refers to the trust and empathy that must be generated between the students and professor during the debriefing, for the critique to be constructive and with kind language. In addition, they expressed their wish to receive more specific guidance with respect to errors or what they missed in the activity with the patient.

Est 1: "...I felt like I needed to be told: 'You should have done this' or 'In this case, this would have worked.' The feedback could have been more specific for us to understand what to work on and how to do it."
Est 5: "professors are very critical and can provide corrections and tips..."
Est 3: "The feedback could have been more specific for us to understand what to work on and how to do it."
The debriefing also contributed to reflecting on the need to assess aspects that add to providing a service with health care standards, biosafety regulations (washing hands and using personal protection equipment), patient safety, humanization, communication and teamwork. Furthermore, they mentioned that this reflective process continued beyond the debriefing, highlighting metacognition as a dynamic process.

Est 2: "...During the feedback, we realized we didn't put on gloves or, perhaps, didn't put our hair up the best way."

Est 3: "Feedback allows us to reflect on how we are failing and how to learn to speak with a patient..."

ES3: "After the feedback... we held a feedback session among the five of us and realized our most significant mistake was not maintaining a guiding thread throughout the interview with the patient."
When it comes to the time dedicated to the debriefing, students expressed the importance of this moment, during which they receive feedback and observe the difficulties and fear that can come up when attending to patients. They performed a self-assessment exercise with respect to the expected learning outcomes, their current level, what they are missing, what they should have done and what they could do better. The students stated they had difficulties expressing themselves, requesting information adequately and working with their peers. To achieve this level of feedback, it requires more time than was estimated in the planning and development of the SSP.

Est 5 "The feedback was a race against time – it felt short to me. I feel like time didn't allow our professor to give us some more recommendations or something like that."
Learning has an important relationship with emotions. Emotions control the attention of students, influence their motivation to learn, modify the selection of implemented learning strategies and affect their self-regulation (5). One fundamental aspect of simulations with standardized patients is approaching the emotional component that comes about in participants when they face a situation. A variety of emotions come about during the production, which may or may not facilitate obtaining the learning objectives and outcomes.

Having insufficient information regarding the activity in which the students may participate can cause fear and anxiety due to uncertainty and a lack of trust in their own performance. During this exercise, students considered it necessary to explicitly indicate they would be participating in a simulated exercise and must be prepared with the material they require, which, in this case, is for the systems review.

ES1: "We were nervous; we didn't know what we'd be facing."

ES5: "I would have liked to arrive in the room with more material."
ES3: "I would have faced it with a little more peace if I had been told it was a simulation."

ES7: "What I mean is, one mainly needs to have a starting point from which to start deriving things."
However, other students expressed positive expectations and a willingness to face the prepared scenario. They reflected that taking on an unknown situation also stimulated them to use different tools and strategies that, in the end, generated a sense of satisfaction due to their capacity to solve the problem that was presented.

Est 4: "I thought it was very cool... I think the nervousness would be there whether or not be knew about the activity."
Est 7: "It's good to feel adrenaline."
Est 7: "I really enjoyed being thrown in without anything, to fend for ourselves with what we've learned. I think I really like that... with very few explanations for us to solve the problem."
Some students stated they were afraid to be mistaken, not knowing where to start or how to approach the patient. This was despite having previously participated in role playing games and reviewed the topic, facilitated by the training for the interview and systems review.

ES1: "...We didn't even know where to start. We knew we had to ask for their names and everything, but I just got blocked up."

ES8: "I feel like we could do it well because we have the foundation, but I think what we're lacking is doing it with a patient."
Moreover, actors perceived that the experience for the group was a challenge that brought students and even the actors themselves, to face new situations that required them to use their "soft skills" and professional reasoning capacities to get around difficulties and fulfill the task. In addition, it stands out that the actors, who were in the last semester of their degrees in the SMHS, committed to and were emotionally involved with representing their character and the clinical case. The actors expressed their expectation to adequately fulfill the role and, at the same time, they expressed empathy towards their peers in previous semesters, who participated in the strategy. This helped them be more careful when performing their script.

AC1: "It was an innovative experience because it is a challenge for undergraduate students who have never had an approximation with a patient."

AC1: "They involved us so much in our role as patients... to create a reality as a patient. That is what made them afraid during the interviews or examinations."

AC4: "I feel like that experience helps them a lot to develop. It gives them certain tools they'll be able to use in a real environment."

AC6: "You get worried about making a mistake, and it's common with patients in real life. That causes anxiety, but they (the students) have a chance to get to know what is right and what is wrong…"
In addition, upon analyzing students' responses, a body-movement-emotion relationship was found, which surfaced at the time of the interaction. Students expressed it as a feeling related to their body language or capacity for movement.

Est 2: "The truth is, from my case and the group in general, I think none of us moved how we normally move… in my case, towards the beginning, I was blocked up and choked."

Est 4: "We don't have the experience. For example, I went in and froze… And I have a lot yet to learn!"
3. Scenario

The scenario, as a space intended for representation, supports the learning path in the sense of granting students a space similar to real life. It provides them the context of the situation they have to face and can positively or negatively influence performance within the complex simulation.

The availability and organization of the space in which the activity is performed plays a significant role in it being developed in the best possible way. Although there is a physical infrastructure intended for the simulation laboratory, it is necessary to carefully plan the number of students, in accordance with the possible capacity, as well as the availability of biomedical equipment and devices, which contributes to the environment being similar to real life. Some students felt the space was too small for the group that was in the hospital room, which highlights the need to organize the number of people that can fit within the scenario at any given moment.

ES1: "There were a lot of us inside a small room."
On the other hand, the design and decoration of the scenario provided by visual elements, such as decorations, sound, clothing and lighting, jointly contributed to the place in which the scenario was carried out, maintaining its credibility. The set design was organized according to the prepared clinical cases in a space for outpatient consultations and hospitalization, with each space's inherent elements. The students observed an environment that was convincing for some, and stated they were nervous about interviewing the patient, since they thought it was a real patient from the time they read the prepared clinical record on the platform, with signs and symptoms they recognized according to the pathology described in the record.

ES3: "I was very nervous when I went in and saw the patient, and I could have sworn it was real."

ES8: "Plus, it was real because of the way they did it. I felt it was real because of how they acted."
Nevertheless, some details related to the adaptation of the scenario, patient and physical space, as well as the activity's organization, led some students to realize they were in a simulated activity. For some of them, it was a valuable opportunity in which they practiced their clinical reasoning, since they found inconsistencies between the scenario, physiopathological characteristics and clinical elements.

Est 6: "With intravenous fluids, but I looked at the tube and nothing was going through it."

Est 1: "A very pale face, right? But her neck and hands were their natural color, so I don't know – maybe those small things made me realize it was a simulation."
4. Performance

The actors' performance was assessed from the perspective of the acting school's educators and students who participated in the simulation. When it comes to this aspect, the actors credibly represented their roles and met the interpretation expectations in the planned scenes, in accordance with the defined clinical case.

AC1: "We got so involved in the role as patients… to create a reality, and that was what made the students a little bit afraid."

AC4: "On certain occasions, we can try to feel the things the patients must experience… this helped us better represent all the characteristics of the role we were going to develop."
The actors and course professors highlighted the training provided by the acting school because, despite the actors having little acting experience, they were able to perform as expected due to the implemented pedagogical strategy. The actors themselves positively emphasized having gained skills that allowed them to represent the assigned role and work on their communication, confidence and security.

ACT7: "The professors of the acting school always provided feedback to improve the character. They were respectful and consistent, which allowed carrying the project forward."
However, aspects, such as coherence between the case patient's age and the actor's age can be improved, since a duality can be created between the information in the clinical record and the student's observation. It is necessary to take this aspect into account to make the situation more accurate according to reality.

EA2: "...Adjusting the cases according to the actors' ages to improve credibility."
ES5: "For the consistency of the role, for the 60-year-old patient to be a person of around that age and young people to be young. That way we can also probably feel more involved in the exercise."
The actors and educators from the acting school suggested and recommended carrying out a final pre-test prior to the definitive implementation of the scenario in which the simulation is programmed to be executed.

EA1: "The final pre-test must be carried out in the place the dramatization will be performed, and with all the elements that will be used that day."
AC3: "focus more on rehearsing the different pathologies to be simulated."
AC1: "In addition, in terms of the environment, it would have been much better to have had the opportunity to take the pre-test in the environment where the activity was going to be performed with clothing and some make-up to relate to the patient better."

Discussion

The simulation as a pedagogical strategy for the education of physical therapists facilitates acquiring the skills inherent to professional knowledge. It seems to have an effect that can be compared to that of other educational strategies in developing clinical practice skills, and plays a valuable role in undergraduate education. The results of this project show that the option of including this strategy in students' education can be beneficial for their learning process, especially when it comes to skills that involve practical abilities and communication skills with users. In the simulation, students had the opportunity to act within a safe and controlled space, in order to gain skills in clinical reasoning and the various steps it involves (12).

This project created simulated patient scenarios to facilitate developing clinical reasoning, professionalism, communication skills and physical exploration in the examination by systems. The simulation was positively accepted and valued by students. However, it was found that it is necessary to perform a full briefing that provides them the framework of the activity to be performed, in order to favor better performance within the scenario and, in this way, promote the knowledge, skills and attitudes of the students. When students feel confident in academic exercises, this reduces anxiety and facilitates their performance and critical thinking for decision-making (13–15).

The results of this pedagogical experience corroborate the use of complex simulations as a learning strategy, in order to prepare physical therapists for their professional practice. The simulation experience allowed students to meet various learning outcomes within a short period of time and in a significant way, as concluded in some studies (2, 3, 16).

With respect to emotions, various studies (5, 17, 18) have shown the need to know and manage them within teaching processes, since they play a significant role in learning. Emotions are a condition mediated by various factors that can influence the learning path and even completion of the ELOs. Emotions come about because the scenario allows uncertainty, fear, anxiety, frustration and expectations to emerge. The intrinsic motivation the simulation creates helps obtain the learning outcome in a practical, concrete and immediately usable way. It also stimulates each student's confidence in their capacity to complete a task (19). In this pedagogical exercise carried out with second-year students, they refer to a variety of emotions during the simulation activity (20), including fear, anxiety and self-doubt. However, they expressed satisfaction after finishing the activity due to their achievement and the capacity to solve situations that were initially unknown. According to Tyerman (15), this improves self-confidence and performance, and significantly results in learning by doing.

With respect to the debriefing, as referenced in other studies (21–24), its importance is recognized when it comes to constructively showing students what aspects of performing a task or activity they can improve. Being specific in what they have to do, how they were mistaken and highlighting their emotions are fundamental aspects for the process. The students considered the debriefing a valuable moment in the learning process for creating adherence and confidence in their skills. Moreover, they appreciated this academic space as a moment for reflection and metacognition, emphasizing the aspects that stood out from their participation and those they can improve.

The challenge for the team of professors is to create a scenario that is as real as possible, watching for details, such as intravenous fluids, supplemental oxygen or vital signs. Students must face a situation in which they have to solve a problem using their communication and reasoning skills, in order to interview the patient, carry out the examination by systems and complete the clinical record. Even though the simulation with the standardized patient can enhance students' learning experience, it is necessary to study and analyze the cost-benefit of developing and administering these simulation experiences, as concluded by Mori (2, 25). Dramatized simulations require a large amount of time and logistical, infrastructure and human resources, as was the case for this pedagogical exercise. This represents a cost to be considered for curricular implementation.

As a limiting factor in this process, it is recognized that the ages of the selected actors did not correspond to the ages of some of the patients in the proposed clinical cases. This happened because the call for actors was made within the University, inviting students from different degrees to participate. Participants recognized this difficulty, so the recommendation is to adjust the clinical cases to the ages of the actors or call for older actors. On the other hand, the final rehearsal of the activity was carried out in another room because the simulation laboratory was not available; this made it impossible to clearly identify opportunities for improvement related to the set design.

Conclusions

The SSP learning strategy enables students to develop the ability to integrate and analyze biological, personal and contextual variables to understand the health status of a patient/client, their movement condition and effects on functioning. By means of an interview and examination, students interpret data obtained during the interaction with the patient and their family members. This contributes to formulating hypotheses that explain why the movement or health condition of the patient/client has or has not been affected.

Students expressed that the clinical simulation scenarios with standardized patients are necessary for their professional education because they help meet their ELOs and allow them to practice necessary skills for clinical interviews and the examination by systems. Furthermore, it improves self-confidence and communication skills, and facilitates interactions with patients in a real environment. Team work, metacognition and emotional management are competences that can be enhanced with this exercise.

The standardized simulated patient strategy is a pedagogical option that is highly valued by students.

It helps them develop cognitive, psychomotor and attitudinal skills in a protected environment. It is important to offer adequate briefing to favor managing the emotions generated by the simulated environment and to end with a debriefing to analyze students' performance within the scenario and identify positive aspects and which must be improved.

Abbreviations

ELO
Expected Learning Outcome
SSP
Standardized Simulated Patient

Declarations

Availability of data and materials:

The datasets generated and/or analyzed during the current study are not publicly available due to these involve the responses of active students at the university and consent was not requested to publish this data; however, are available from the corresponding author on reasonable request.

Ethics approval and consent to participate

All methods used were carried out in accordance with the guidelines and regulations provided by the Declaration of Helsinki and in Colombia by Resolution No. 008430 of 1993. As part of the pedagogical strategies of the course, informed consent was obtained from the students prior to their participation on a voluntary basis, with no repercussions on their grades if they did not accept. The Research Ethics Committee of the Universidad Del Rosario-Social Sciences Room (CEI-UR), considered that the nature of the project originally proposed corresponds to pedagogical innovation implemented as part of a subject of the program's curriculum and that it was not configured as a research project (Act N° DVO005 428-CS282). Consequently, the manuscript presented can be considered as a systematization of pedagogical experience through a retrospective research process that contributes to the knowledge and better use of the Standardized Simulated Patient strategy.

Competing interests

The authors of this study declare no financial and non-financial conflicts of interest.

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Authors' contributions

All authors of this article, mentioned below, have directly participated in the planning, execution, and analysis of this study, and have prepared and approved the final version of this paper.

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