

ORIGINAL RESEARCH



Improving interprofessional team simulation learning. One more step towards the humanization of health care in emergency situations

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Abstract

Interprofessional education refers to the collaboration of students from different disciplines towards the resolution of a series of clinical situations. The general objective of this study was to analyze the perspective of the participants in interprofessional simulations (doctors and nurses) in emergency situations. Qualitative study with an inductive approach for the identification of categories derived from the opinions provided by the participants in interprofessional simulations was conducted (n = 58). Individual open-ended questions were provided through a self-completed qualitative questionnaire. The answers were subjected to a descriptive content analysis. Three emergent themes, 13 categories and 21 sub-categories were obtained. Emotions-related aspects, strengths, and areas to be improved were identified with respect to the interprofessional simulations. The participants highlighted the great closeness to reality, they felt comfortable and confident, and their positive emotions had a greater weight than the negative ones (uncomfortableness, frustration, and insecurity). The most prominent positive aspects were teamwork, the realism of the training, and the empowerment of the nurses. The areas that could be improved were those related to aspects associated with carrying out the simulations, the demand for joint planning, and the improvements in the development of the sessions by the facilitators (co-debriefers). This work demonstrates the good reception of the learning experience by the participants. Interprofessional simulations are great learning tools, although weaknesses were found that could be improved with adequate planning by the educators.

Keywords

Interprofessional simulation; Interprofessional collaboration; Interprofessional teamwork; Simulation training; Qualitative research

1. Introduction

It is imperative for health professionals who work with people to possess professional and human values, to make patients feel that they are in the best hands and the center of attention [1, 2]. If health workers share the same perspective and common values with respect to health care, this will have a positive repercussion on the health of the patients and the workers themselves [3].

The quality of health care greatly depends on the interdependent work of different health professionals [4], and interdependence training can be provided with simulated environments [5, 6].

Interprofessional education occurs when students from two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes [7]. It is about interactive learning where the students work

and collaborate by combining their competences.

The World Health Organization (WHO) called for the development of interdisciplinary activities to promote teamwork, and to achieve common goals and objectives [8]. Interprofessionality refers to the coalition of perspectives, knowledge and practices throughout the process of patient care, even when the perspectives of these professionals are in opposition [9].

The objective of simulation training is to train and assess the behavior of the participants to improve their performance in a specific area [10]. Interprofessional education can be conducted when students from different disciplines collaborate to resolve a series of realistic, although simulated, clinical situations [2]. The assessment in this model of learning is primordial for the measurement of results and the observation of possible aspects that need improvement [11].

When aspects such as communication, leadership, assertiveness, or adapted interdependence among professionals is not

adequate, the individual who is harmed, aside from the professionals themselves, is always the patient [12].

Simulation contributes with the acquisition of both technical and non-technical professional skills [13]. Interprofessional training is usually well-accepted by the participants [5, 14]. However, it is not common for doctors and nurses to learn or train together in a university environment. It is more common for these different professionals to not come into contact with each other until they provide care in real-world environments, as they are interdependent professions.

In the area of emergencies, a good interprofessional adaptation is perhaps even more important than any other aspect [15]. Teams that work together well can more efficiently respond to the demands brought on by emergencies.

Despite the observations which indicate that interprofessional training with simulation significantly improved the competences of participants in health sciences [16], an in-depth analysis of the opinions of the participants is still needed which could help to improve the structure and the development of this type of learning, especially within the context of emergencies.

The main objective of this study was to analyze the perspectives of interprofessional simulation participants (doctors and nurses) in emergency situations and contexts. The following specific objectives were defined:

- (1) To interpret the opinions of the participants on the positive aspects of interprofessional simulation.
- (2) To analyze the areas to be improved perceived by the participants in interprofessional simulations.
- (3) To describe emotional aspects described by the participants after a simulation experience.

2. Methods

2.1 Design

A qualitative study with an inductive approach was designed for the identification of theoretical categories derived from the opinions provided by the participants [17]. When choosing this method, we assumed that the freely expressed opinions of the individuals would provide us with an in-depth perspective of the subject studied.

2.2 Study location and participants

The study was conducted at the Catholic University of Murcia (UCAM), in academic years 2019/20, and 2020/21. The informants chosen were students enrolled in the Emergency and Special Care Masters, from both medicine and nursing fields (N = 109). As the inclusion criteria, the participants had to have been part of interprofessional simulations conducted within the framework of the postgraduate studies in medicine and nursing. As these are different degrees, they only collaborate in the Advanced Clinical Simulation course, where they train on teamwork in emergency scenarios in hospital and out-of-hospital emergencies.

As for the characteristics of the sample, each simulation group was composed by 8–10 students, divided into work teams composed of 3–4 students.

All the students who participated in the sessions were included, except for those who did not attend the sessions due

to different circumstances (isolation due to suspected Covid-19 case, those who were ill or due to personal reasons, etc.). The recruitment of the participants was due to convenience and therefore not random.

2.3 Procedure

The data were collected between the months of February 2020, and March 2021, through an individual and anonymous online qualitative questionnaire with open-ended questions, to be completed after the simulation sessions.

The development of the simulations was carefully planned. All the participants were familiarized with the surroundings, as they had previously received simulation training in the context of their master's degree coursework, and were informed about the objectives and development of interprofessional simulations (prebriefing) [18, 19].

Small teams were defined, which took part in different clinical cases in hospital and out-of-hospital settings inside the UCAM simulation center. In the hospital cases, the team was composed by two doctors and two nurses, while in the out-of-hospital cases, the team was composed by two nurses and a doctor. These members had to combine their knowledge and skills to deal with a series of cases, which were carefully designed by the teaching team. The process was coordinated by the instructors from both degrees, who played a role as co-debriefers [20].

Each scenario began with a brief presentation on the clinical case and a description of what could occur in the simulation room, provided to the team and the rest of the colleagues (briefing). The team who would handle the case were given a few minutes to assign roles and tasks, after which they proceeded with the case.

Each scenario took an average of 20 minutes to complete. Afterwards, the behaviors of the participants were analyzed (structured debriefing), in a session which lasted about 40 minutes.

Supplementary Tables 1 and 2 describe the scenarios experienced and their most important characteristics (we can observe the approximate duration of the simulations and the debriefing, and a summary of each case).

2.4 Instruments

At the end of the simulations, the participants were provided with a link to an online questionnaire for the collection of data, composed by three open-ended questions which encouraged the participants to freely answer, without a word limit, the following questions: How did you feel in these simulations? What positive aspects would you highlight about the simulations as a whole? What aspects could be improved? And why? The questionnaire was created by the research team through consensus to obtain the opinion of the participants, and afterwards, their responses were subjected to content analysis [21, 22]. To prepare the questionnaire, open-ended questions were prepared that could only be analyzed qualitatively, not quantitatively. To this end, the common scheme of reflective analysis (debriefing) was followed. We asked about the emotions experienced (first phase of debriefing/reactions phase), then about strengths and weaknesses (2nd phase or analytical

phase). In addition, we added the question: why?

The questionnaire had content validity, and other indices of validity and reliability could not be calculated as it is a qualitative and non-statistical study, with open-ended, free-response questions.

2.5 Data analysis

All the study researchers had independent access to the participant's responses to interpret and analyze the results. The categorization of the data was performed independently, and they were combined afterwards to reach an agreement on the results.

For the correct categorization and open coding of the results, thematic units were created which encompassed the opinions and answers of the students. These were analyzed inductively and in a descriptive manner. A series of meetings took place to assess the development of the study and to discuss the results before creating the final report. A reflection-based strategy was followed [23] to avoid altering the interpretation of the results by the researcher's subjectivity. During the codification of the opinions, thematic units were obtained which shaped the themes/categories, and subcategories. To assess the weight of the data, the frequency of the opinions that emerged were calculated, so that those that were categorized as categories/subcategories were analyzed according to the percentage obtained by the team from the total elements codified from the transcriptions.

2.6 Ethical considerations

All the participants signed an informed consent form before providing their opinions. The simulations were always conducted by prioritizing respect and promoting the values of union and teamwork. The study was approved by the Ethics Committee from the UCAM, with reference number: CE012107. To safeguard the identity of the participants when presenting the verbatim text, the responses presented were codified (for example, N followed by a number refers to the opinion from a nurse, and a D followed by a number refers to the opinion from a doctor).

3. Results

Ultimately, 58 health professionals participated in this study ($n = 58$), for a 53.21% response rate. From this total, 50 were women and 8 men, with a mean age of 26.5 ($SD = 2.54$). As for their professional category, 19 participants were doctors enrolled in the post-graduate degree in emergency medicine (32.8%), and 39 were nurses enrolled in the emergency nursing master's degree (67.2%). After an exhaustive analysis of the responses collected in the questionnaire, 3 emergent themes, 13 categories, and 21 subcategories were obtained (Table 1).

3.1 Emotional aspects

These themes referred to feelings and emotions, both positive and negative, experienced by the participants during the inter-professional simulations. Two categories emerged: positive emotional aspects, and negative emotional aspects, from which

different subcategories were obtained. The participants considered 69% of the aspects evaluated as positive, while the rest were considered negative (31%).

3.1.1 Positive emotional aspects

Most of the participants highlighted the importance of teamwork. The emotions derived from teamwork were mostly positive (they felt comfortable and confident).

In the simulations with colleagues from the emergency medicine master's, I felt comfortable, and performing the nursing tasks and working as a team, really... (N8)

I felt comfortable. (D26)

Supported (...) learning how to work with them is very important. (N3)

Supported, confident, and realized. (N5)

3.1.2 Negative emotional aspects

The negative emotional aspects were fundamentally expressed by the nurses, as shown in Fig. 1. Some of the participants felt frustrated, and in some of the cases, they felt "left out" from the decision-making process or alienated from the situation that was addressed from the doctor's perspective. Some of the nurses experienced a feeling of inferiority and lack of consideration.

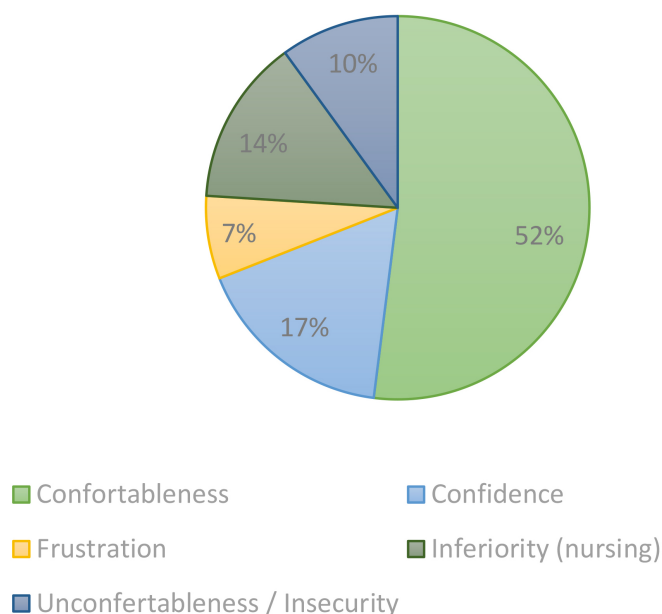


FIGURE 1. Emotional aspects. * The percentages are calculated with respect to the weight of each subcategory on the total opinions associated to emotional aspects.

(...) sometimes a bit frustrated. (N9)

On some occasions lost, anxious, and impotent. (D40)

(...) on the other hand, not well positioned, as it is complicated for some doctors to take our opinion into account. (N16)

3.2 Positive aspects of interprofessional simulation

Most of the students considered this type of joint simulations as necessary. The positive aspects are shown in Fig. 2.

TABLE 1. Summary of the content analysis results.

| Theme | Categories (%) | Subcategories | % ** |
|--|--|---|-------|
| Emotional aspects (how the participants felt) | Positive emotional aspects (69%) | • Comfortableness | 84.37 |
| | | • Confidence | 15.63 |
| | Negative emotional aspects (31%) | • Frustration | 25 |
| | | • Inferiority (nursing) | 33.3 |
| | | • Uncomfortableness/Insecurity | 41.67 |
| Positive aspects of training with interprofessional simulation | Teamwork (39%) | | |
| | Closeness to reality (16%) | | |
| | Joint debriefing and knowledge (15%) | | |
| | Nurse empowerment (18%) | • Awareness of high competence | 23.08 |
| | | • Awareness of high level of knowledge | 38.46 |
| | | • Trust, confidence and personal realization | 38.46 |
| | Interprofessionality (12%) | | |
| Aspects to be improved in training with interprofessional simulation | Development of simulations (28%) | • Realism could be improved | 5.88 |
| | | • Case duration (excessive) | 5.88 |
| | | • Preference for unknown situations | 5.88 |
| | | • More prior information on the cases | 23.53 |
| | | • Joint training is unnecessary | 5.88 |
| | Debriefing (17%) | • Everything is fine (no aspects to be improved) | 35.29 |
| | | • Psychologically-safe environment missing | 17.66 |
| | | • Dedicate less time to debriefing | 40 |
| | | • Debriefing oriented to each profession | 20 |
| | | • Joint debriefing | 40 |
| | Teams and roles (7%) | • Improve group conformation | 50 |
| | | • Improve role assignment | 50 |
| | Level of prior common knowledge (31%) | | |
| | Facilitation (10%) | • Improvement in personal treatment (nursing) | 33.33 |
| | | • Co-debriefing too centered on medicine | 66.67 |
| | Communication (7%) | | |

** In this section, % is expressed normalized according to the category to which the subcategory belongs, not the theme.
The most relevant results are highlighted in bold.

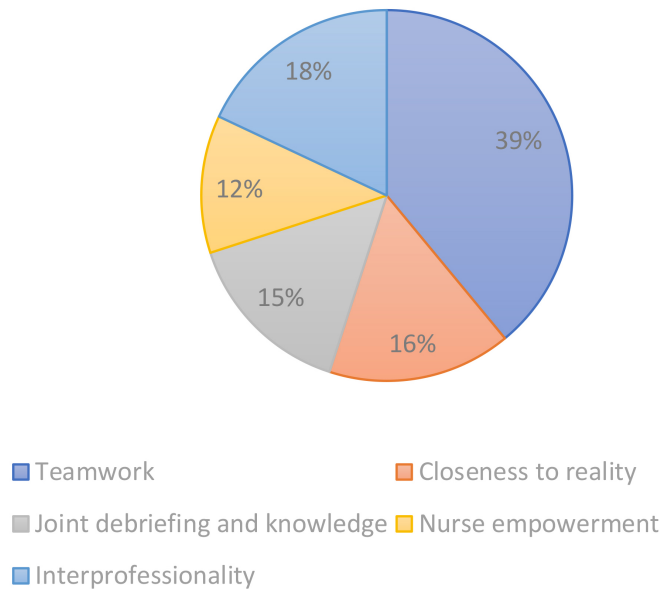


FIGURE 2. Answers associated to positive aspects. * The percentages are calculated with respect to the weight of each subcategory on the total opinions associated to positive aspects.

3.2.1 Teamwork

Most of the participants were satisfied with the teamwork.

The ability resolve of the nurses and the rapport for working as a team. The good mutual understanding with the doctor team. The facilitators and the cases chosen. (N2)

I would mainly highlight learning to work in a multidisciplinary manner, which is presented to us theoretically throughout the years, but we have never experienced. (N3)

Work in a multidisciplinary team, which is vital in our daily practice, as we not only work with other doctors. (D34)

Teamwork. (D25)

3.2.2 Closeness to reality

I would highlight the similarity with real-life work, since you never work only with nurses, but instead it is multi-disciplinary work, which was mirrored very well in these simulations, in both its advantages and disadvantages. (N9)

It gives you the opportunity to simulate the day-to-day in a more realistic manner. (D43)

3.2.3 Debriefing and combined knowledge

The students underlined the exchanges of knowledge established in the debriefing as a positive aspect.

Complement knowledge between both disciplines, understand teamwork and guarantee the safety of the patient. (N5)

Exchange of knowledge. (N22)

To understand the nurse's work better. (D24)

Everything, the interaction between both healthcare providers. (D46)

3.2.4 Nurse empowerment

Some of the nursing master's participants highlighted their surprise when becoming aware that they had a high degree of competence in some areas (such as immobilization and transfer

of multiple-trauma patients in an out-of-hospital setting). After the simulation, many felt good when they perceived they had more competences than they believed before taking part in the joint simulations.

Very good, the nurse's knowledge was the same and sometimes greater, and this gave us confidence about the nursing team. (N15)

Very good, I became aware about all my skills and knowledge, I feel prepared for the everyday practice, and I have felt it in these simulations, as we found ourselves in more realistic situations with the doctors, with each of us assuming our role in the practice. (N13)

It helps me see that I knew a lot more things that what I originally thought (...). (N7)

3.2.5 Interprofessionalism

Most of the students asked to be part in more joint simulations, as these were very close to the reality of providing care.

Perhaps it would be interesting to take part in more simulations with medicine colleagues throughout the academic year; I think it would be good for both to work on simulations together, to share knowledge, how to work, different perspectives, and especially, interprofessional communication. (N13)

I would've taken part in more joint simulations. (D43)

3.3 Aspects to improve

After analyzing the responses to the questionnaire, five aspects to be improved were obtained. These are shown in Fig. 3.

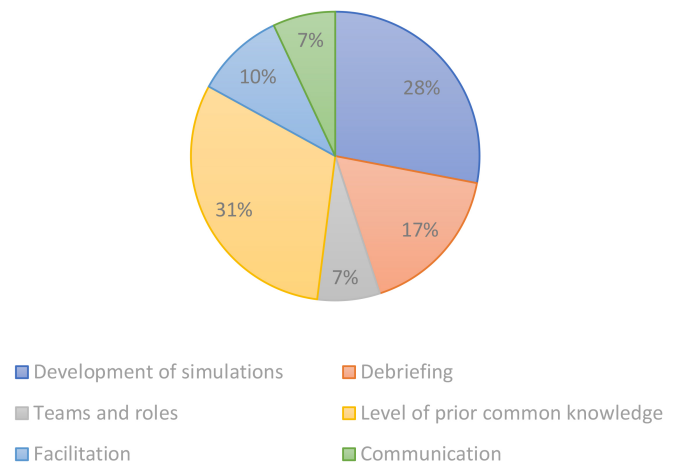


FIGURE 3. Answers associated to aspects to be improved. * The percentages are calculated with respect to the weight of each subcategory on the total opinions associated to aspects to be improved.

3.3.1 Development of the simulations

It was observed that some of the participants did not have much experience on training with simulation, therefore, a complete inclusion was not achieved in the scenario. The duration of the cases was considered a weakness, just as the information available on some of the cases.

It was noticeable that (...) did not have much experience in simulation, limiting the simulated reality with expressions

such as this just a manikin, or why do I have to simulate the intubation if this is about to end, or this case is going to become complicated, because I know the professor. (N12)

Make the simulations shorter so that we have time for more cases. (...) (N7)

(...) wouldn't reveal the cases will take part in before the simulations. (N2)

On the contrary, other participants expressed the opposite opinion, and asked for more information before the simulation.

Provide information before the different clinical cases presented to take advantage of the simulation. (D24)

Among the 58 opinions, only one participant in the inter-professional simulations perceived them as completely unnecessary. On the other hand, most of the participants would not change anything about the methodology, development and execution of the simulations.

The selection of the cases was appropriate, and the methodology too, I think. For now, I wouldn't change anything. (D34)

Nothing should be improved. (D39)

It is important to highlight the settings as something to be improved, as they were not perceived as safe on some occasions.

(...) Get to know each other before the simulations, to better define the roles. (D40)

3.3.2 Debriefing

Some participants suggested performing a reflective analysis separately (doctors and nurses), to better specify the aspects to be improved and the strengths of both professions/professionals, instead of a joint discussion.

As some of the aspects to be improved, I think it would be good that in each debriefing session, a plus/delta (strengths and weaknesses) could be done for the nurses, and a plus/delta for the doctors, to see what each could improve within our professional limits, in this situation in the real world. (N9)

On the other hand, others thought that the debriefing should be combined, as we are dealing with teamwork, and their performance should be analyzed as a team. Another aspect to be improved was the exclusive focus that could have been given, from the point of view of the participants, to a specific group of professionals.

I think the debriefing after the simulation focuses too much on medicine, and not enough in nursing. In fact, the professor from the medicine master's give the class in a manner that is identical to how it would be done in a medicine-only simulation. (N28)

The only thing I would improve in the joint sessions with the medicine master's is that it focuses too much on them and their subject. (N37)

3.3.3 Teams and roles

Another of the aspects highlighted was the proposal to improve the shaping of the interprofessional groups.

The manner of creating the groups to squeeze the strengths of each one to the maximum. (N2)

I think the assignment of roles could be improved. (N18)

3.3.4 Level of comparable prior knowledge

From the point of view of the participants, it would be interesting to have common information and protocols to set the baseline before taking part in the joint simulation.

That the curricula in both degrees become more similar so that we can take part in more joint simulations between both groups of professionals. (N3)

Before this simulation, that both medicine and nursing have the same degree of knowledge about the subjects we will deal with, so that academic inequalities do not exist (N16)

A very good option would be to receive common theoretical knowledge (...) (D44)

3.3.5 Facilitation

In some sessions, a psychologically safe environment was not created, so that a certain discomfort among some participants was produced. This aspect was attributed to the style of facilitation utilized by one of the co-debriefers.

The treatment received from a professor (...) and the orientation of the cases towards them, ignoring our profession, interventions, skills, leadership, usefulness, and everything we do to improve. (E4)

3.3.6 Communication

Thanks to the simulations, a need to improve communication between professionals was detected.

Communication between the two teams. (E35)

Improve the inter-relations and thus improve communication in simulations. (M45)

4. Discussion

The available evidence supports the idea that interprofessional clinical simulation is fundamental for the training of teams [16, 24, 25]. Teamwork, coordination, communication, and good problem-solving abilities are fundamental non-technical skills of health professionals. In some studies, it has been shown that these skills improve after simulation, and are necessary for the good functioning of an interdisciplinary team [26].

This work has demonstrated the good reception of this learning experience among the participants. We are interested in highlighting and discussing the positive aspects, but overall, the aspects that could be improved. As we shall see, these aspects were related with the atmosphere of the simulation and the atmosphere of trust necessary for the participants' improvement in the future. The elimination of frictions and the creation of an atmosphere of respect are necessary, perhaps even more than the design of scenarios or the preparation of a realistic setting. Another aspect that should be mentioned is the crucial role of the facilitators in the creation of this atmosphere. The co-debriefing dynamic should be planned beforehand. This requires a great amount of work prior to the simulation and trust between those who manage the simulation. The main findings of the study are presented below.

In first place, with respect to the emotional aspects experienced by the professionals, it was observed that most of them felt comfortable with teamwork. Only five responses were found which indicated an uncomfortable aspect or insecurity, associated with feeling misplaced in the simulation room, and

the little practice with this type of simulation. It is necessary to highlight the importance of a phase prior to simulation (pre-briefing) [27, 28] where the foundations are set to achieve a psychologically-safe environment, as well as an adequate situational awareness, realism, fidelity, and behaviors adapted to the case that will be simulated. The participants should be instructed on the dynamics of simulation, debriefing, management of simulators, location of the equipment, clarification of roles, etc. [18].

Despite the comfort and the satisfaction with teamwork, the feeling of frustration and inferiority was found in some testimonies from the nursing professionals' group. This was especially associated with the lack of recognition with respect to the contributions of the nurses during the resolution of some scenarios.

Teamwork was highlighted as the most relevant dimension, especially in the nurse group (74.4% considered it important). Another of the highlighted results was the perception of empowerment of the nursing professionals once the joint simulations had ended. The feeling of greater competence from the expected contrasted with the frustration felt on other occasions.

As for the aspects that should be improved associated with the development of the simulation, diverse aspects were mentioned which led to the search for improvements in the planning and design of the sessions according to shared standards [11], which could improve the motivation of the participants [29]. The duration of the scenario and the time dedicated to debriefing, along with the realism and the fidelity, were key aspects defined as important by international recommendations on simulation [30, 31].

Among the responses associated to the debriefing, a certain controversy was observed with respect to the orientation of the debate. On the one hand, the suggestion was made that it should be differentiated according to profession, and on the other, a joint debriefing was solicited. Although the participants assumed their real professional roles during the simulation, the recommendations on multi-professional debriefing emphasized the need to deal with common themes according to blocks (clinical aspects, non-technical aspects, evaluations of the participant's actions and their consequences, etc.), advising against focusing on only one professional group, as long as it was possible [20, 32].

Simulation-based learning requires expert facilitation to help the students obtain meaning from the learning opportunities [33, 34]. However, in interdisciplinary simulations, the presence of two facilitators (co-debriefing) is more common. It is essential to have an adequate level of adaptation and harmony between them, and if this is not the case, it can result in uncomfortable and counterproductive situations for learning [20]. An argument has been made [35] that it is possible for a single debriefer to be more effective than the co-debriefers, given the greater variability introduced by a second educator.

In our case, we believe it is necessary to reinforce the prior collaboration of the co-debriefers, having in mind the aspects that could be improved, and the weaknesses detected in this study. An interesting aspect mentioned was that the co-debriefers could be divided not by professions but by topics (a

facilitator could deal with the clinical aspects and the other the non-clinical ones, for example). This and other recommendations for the co-debriefing are based on the establishment of harmony and a structure of facilitation that is substantiated by previous meetings between the co-debriefers [20]. A well-executed introduction where the facilitators set objectives and goals could improve learning and collaboration, decreasing mistakes, misconnections, and lack of attitude during the debriefing [36].

Another aspect that could improve the simulations is considering the creation of safe environments before the simulation experience. The recommendations on this aspect in simulation included icebreaking activities, gamification activities, among others [29]. The participants should be familiarized with simulation learning, and this could be achieved with a previous meeting or pre-briefing [37]. The prior contact with the settings and the previous experience will reduce the level of anxiety of the participants, thus promoting a greater participation [19].

Lastly, we want to highlight the importance of joint training on the improvement of communication skills. In our study, communication between professionals was one of the aspects to be improved. Good communication allows the members of the team to exchange information about their perceptions of the clinical situation they are taking part in. It also allows them to share information and avoid errors, to create a shared model of understanding at the team level with skills such as assertiveness, which can be trained [38]. Interprofessional simulation will help reflect on the communication weaknesses of the teams (as demonstrated in this study), and this would result in better health care of the patients and the humanization of the care in the context of emergencies.

5. Limitations

The greater number of answers from the nurses could provide us a non-homogenous perspective on interprofessional simulation. On the manuscript, we argued that the teams were shaped in most cases by a doctor and two nurses. In the master's courses there were more nurses than doctors. Another important aspect that explains why there were fewer responses from doctors is that their response rate was lower.

It is possible that since most of the participants were women, the results may not represent the general population of emergency doctors and nurses.

It is a local and qualitative study, so that the external validity (generalization of the results) could be threatened.

More studies are needed to arrive at conclusions with greater validity.

6. Conclusions

Interprofessional simulations are great learning tools. The participants highlighted the great closeness to reality provided by the interprofessional simulation. The participants felt comfortable and safe, and their positive emotions were more important than their negative ones (uncomfortableness, frustration and insecurity). The most prominent positive aspects were teamwork, the realism of the training, and the empowerment

of the nurses.

As for the areas to be improved, the following were highlighted: aspects associated with the development of the simulations, the demand for joint planning, and improvements in the development of sessions by the facilitators (co-debriefers).

AUTHOR CONTRIBUTIONS

Conceptualization—JLDA, CAA, JMCP and CCG; Data curation—JLDA, CAA and CLC; Formal analysis—JLDA, MJPJ, MJPR; Investigation—MJPJ, MJPR and CLC; Methodology—JLDA, CAA, JMCP, CCG and CLC; Project administration—JLDA and CLC; Resources—JLDA and CLC; Software—CAA and MJPJ; Supervision—JLDA and CLC; Validation—JLDA MJPJ; Writing—original draft—JLDA, CAA and CLC; Writing—review and editing—JLDA, CAA, JMCP and CCG.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

All the participants signed an informed consent form before providing their opinions. The study was approved by the Ethics Committee from the UCAM, with reference number: CE012107.

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CONFLICT OF INTEREST

The authors declare no conflict of interest. César Leal-Costa is serving as one of the Guest editors of this journal. We declare that César Leal-Costa had no involvement in the peer review of this article and has no access to information regarding its peer review. Full responsibility for the editorial process for this article was delegated to MK.

SUPPLEMENTARY MATERIAL

Supplementary material associated with this article can be found, in the online version, at <https://oss.signavita.com/mre-signavita/article/1453664397144539136/attachment/Supplementary%20material.docx>.

DATA AVAILABILITY

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

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