




ORIGINAL ARTICLE

Interprofessional education using clinical simulation for the development of communication skills

HIGHLIGHTS

1. Poor communication and teamwork affect clinical safety.
2. Simulation strengthens interprofessional non-technical skills.
3. Interprofessional education promotes communication in complex healthcare.
4. Communication and teamwork improve conflict resolution.

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ABSTRACT

Objective: to evaluate the development of interprofessional communication skills focused on patients and their families among students in health-related degree programs through interprofessional education based on clinical simulation. **Method:** mixed study (QUAL+quan). Direct observation, surveys, rubrics, and focus groups were used. Data collection took place in March 2023. The sample was convenience-based, excluding students of Medical Technology and those at or below the third-year level. Forty students from four disciplines at the Universidad Santo Tomás, La Serena, Chile, participated. Quantitative data were analyzed with descriptive statistics using IBM SPSS®. Interviews were transcribed verbatim and interpreted using content analysis with ATLAS.ti. **Results:** the simulation promoted interprofessional skills, highlighting the relationship between communication and role clarification as key to patient safety. **Conclusion:** understanding of roles, communication, teamwork, and conflict resolution was strengthened.

DESCRIPTORS: Interprofessional Education; Professional Competence; Simulation Training; Communication; Students, Health Occupations.

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INTRODUCTION

The main objective of patient safety in the healthcare system is to prevent, avoid, or reduce harm resulting from medical care, considering that errors are an inherent part of the human condition. To address the most common problems described in the available evidence, the International Patient Safety Goals were established in 2002. These goals include correct patient identification, improving effective communication, ensuring safety in the administration of high-risk medications, providing safe surgeries, reducing the risk of healthcare-associated infections, and reducing the risk of harm from falls¹.

In this complex healthcare environment, between professionals and the people receiving care, it is crucial to provide high-quality care and improve treatment outcomes.²⁻³ Lack of teamwork and insufficient and ineffective communication both within healthcare teams and with patients are fundamental obstacles to providing safe, high-quality care. More than 50% of serious harm and deaths are related to poor communication in teamwork, as well as in communication with the person and their family⁴. Evidence shows that training in human factors, including communication, can have a positive impact on patient outcomes⁵.

Simulation has been widely used in health professional education as an experiential methodology for developing fundamental professional skills, but its implementation has focused primarily on a single professional group⁶. However, interprofessional simulation emerges when "two or more members of different health disciplines participate in shared, experiential learning that reflects on the achievement of optimal health outcomes"⁷.

Research shows that when simulation incorporates interprofessional activities, learning outcomes are enhanced, allowing students from different subjects to acquire non-technical skills such as teamwork, leadership, effective communication, and decision-making. It has been observed that students who have received prior training show less stress, greater confidence, and a better attitude when carrying out procedures⁸.

Simulation and communication training between healthcare professionals and patients play an essential role in improving medical care and patient outcomes. These practices offer an innovative and effective approach to teaching, allowing students to encounter simulated clinical situations where mistakes become learning opportunities.

Interprofessional education promotes collaboration between professionals from different health subjects, encouraging joint learning to improve patient care. This approach fosters effective communication, shared decision-making, and teamwork, which has been shown to reduce medical errors and improve the quality of care. Through interprofessional simulation, students develop technical and non-technical skills, leadership and conflict resolution skills, which are essential for providing patient-centered care to patients and their families throughout the care process.

Collaborative work in multidisciplinary teams is key to addressing the complexity of chronic diseases such as stroke and cystic fibrosis. Coordination between professionals improves clinical outcomes and patients' quality of life. By integrating these interprofessional competencies into the training of health students, they are prepared to face the challenges of the professional environment and provide more efficient, safe, and empathetic care, optimizing both the patient experience and healthcare outcomes. In this context, the objective of this research was to evaluate patient/family-centered communication skills among health students through the implementation of an enhanced interprofessional education approach based on clinical simulation.

METHOD

The research was conducted during the first week of March 2023 at the Clinical Simulation Center of Universidad Santo Tomás in La Serena, Chile. A mixed-method approach was adopted, with both quantitative and qualitative data collected during the same period (QUAL+quan)⁹.

To collect the data, strategies were implemented to observe the performance of interprofessional teams, which were broken down by subject and directly observed by an actress who played a simulated patient during the interprofessional simulation. The Communication Assessment Tool (CAT)¹⁰ was used for this task. In addition, focus groups were held with students and instructors to explore and gain a deeper understanding of the communicative dimensions that emerged between them. Surveys designed by the researchers were also administered to assess students' Basic Knowledge of Interprofessional Competencies (CONIP), Readiness for Interprofessional Learning (RIPLS), satisfaction with the interprofessional simulation experience, and how this learning process was perceived in the context of clinical practice.

A focus group was held with the participation of students and facilitators, including students from Nursing, Kinesiology, Occupational Therapy, and Nutrition. In addition, one instructor from each discipline, the actress, and a moderator participated. During this one-hour session, the experiences gained during the Interprofessional Education (IPE) workshops were explored and described. The connection between the situations experienced in the simulation scenarios and real life was investigated, addressing aspects such as communication, collaborative work, and interprofessional education, among other dimensions and interdisciplinary competencies.

CAT is a reliable and valid tool used to assess how real patients perceive the ability of healthcare personnel to communicate in a person-centered manner. It consists of 14 descriptions evaluated on a 5-point scale (1: poor to 5: excellent), which facilitates understanding. The results are presented as the percentage of items rated as "excellent." In the Chilean context, it has been validated by teachers, translators, instructors, and standardized patients, demonstrating high internal consistency, expressed by a Cronbach's alpha coefficient of 0.95¹¹.

It is important to highlight that the scientific rigor of the qualitative data was ensured through the application of criteria of credibility, auditability, and transferability. The researchers carried out a coding process using the triangulation technique, with the aim of confirming validity and reducing any bias in the analysis of the results.

Setting and participants

The University's Interprofessional Clinical Simulation Project was carried out at the La Serena campus and involved four different groups: Nursing students (NUR), Kinesiology (KIN), Nutrition and Diet (NUT), and Occupational Therapy (OCT), each accompanied by an experienced guest instructor in IP clinical simulation from their respective disciplines, who acted as debriefers and/or observers (N: 4). These instructors were trained by the director of the simulation center. The total sample (N: 40) included 17 NUR, 8 KIN students, 8 NUT students, and 7 OCT students, all in their fourth year of study.

All participants were recruited through convenience sampling by posting an advertisement on the electronic platforms of each degree program and enrolling students who accepted on a first-come, first-served basis, after signing an informed

consent form and meeting the inclusion criteria: fourth-year students in nursing, kinesiology, occupational therapy, and nutrition and dietetics. First- to third-year students and students in medical technology programs were excluded. Each scenario involved an actress who played the role of a simulated patient, also acting as debriefer and observer.

Study procedures

Instructors from various subjects, in collaboration with researchers, worked together to create four IP clinical simulation scenarios. These scenarios were tested prior to the pilot (called the pilot test) during training sessions at the simulation center with students who shared similar characteristics to the student/participant group, thus ensuring clear understanding and appropriate flow in the scenarios. Subsequently, adjustments were made based on the tests carried out, when necessary. The Interprofessional (IP) scenarios focused on patients requiring discharge education for cystic fibrosis and stroke, as well as two home visits to relatives of patients with these same conditions.

At the beginning of the academic semester, participating students were asked to complete the Basic Knowledge Survey on Interprofessional Competencies (CONIP) and the Survey on Attitudes toward Interprofessional Learning (RIPLS) one week prior to the simulation day. During the morning, after welcoming the students and providing them with orientation on the facilities, two scenarios were conducted. In the afternoon of the same day, the following two scenarios were presented to the students, where intra-workshop data was collected using the CAT guideline, designed to assess students' communication skills. Each scenario lasted 80 minutes, during which students worked together, and expert observers evaluated their team behaviors.

At the end of each scenario, a debriefing session was held to facilitate understanding of the learning gained from the interprofessional simulation. Afterwards, a satisfaction survey was conducted and focus group interviews were held with students, observers, and the actress to share their experiences with the interprofessional simulation.

Data analysis

In the analysis of quantitative data, descriptive statistics were used to calculate frequencies, means, percentages, standard deviation, and correlation analysis, using IBM SPSS® software.

The interviews were transcribed verbatim and then imported into ATLAS.ti software for content analysis. A secure environment on Google Drive® was used for data storage, management, access, and analysis.

This research involves people, so it includes informed consent to ensure that they participate freely, voluntarily, and in an informed manner. This is a process in which the participant is informed, in writing and verbally, of the importance of their participation, as well as the protection of their data, benefits, risks, and costs that they will have to accept if they agree to participate. All of these criteria were validated by the Scientific Ethics Committee of Universidad Santo Tomás.

Ethical considerations

First, ethical authorization and administrative approval are obtained from the university's institutional ethics committee with letter number 99 – 2024. Subsequently, a preliminary information session is held to explain the objectives and procedures of the research to the groups of participants, educators, and the actress. Emphasis is

placed on the voluntary nature of participation, the right to withdraw at any time, and the assurance that the results of the workshops have no connection with individual academic performance, with the aim of establishing a safe learning environment. At the end of this meeting, written informed consent is obtained from all participants.

RESULTS

Knowledge and willingness to learn IP

The survey to assess students' basic knowledge of interprofessional competencies (CONIP) included 39 items describing the six basic interprofessional competencies proposed by the Canadian Interprofessional Health Collaborative (CIHC), measured as: 1: I know it and can do it, 2: I know it but cannot do it, and 3: I do not know it and cannot do it.

The results showed that most students (N: 40) are aware of IP competencies but do not manage them. If we break it down by competencies, they know but do not manage the competencies of role clarification (M: 1.72, SD: 0.517), collaborative leadership (M: 1.68, SD: 0.567), and conflict resolution (M: 1.82, SD: 0.605); they are aware of and use patient-centered care (M: 1.43, SD: 0.613), teamwork (M: 1.53, SD: 0.561) and communication (M: 1.44, SD: 0.535) competencies. As shown in Table 1, a strong correlation was identified between conflict resolution and teamwork, and collaborative leadership. Similarly, a moderate correlation was found between communication and teamwork, and the same finding was observed between collaborative leadership and teamwork.

The Readiness for Interprofessional Learning Scale (RIPLS) assesses students' willingness to engage interactively with other students in their learning process. It includes 24 items divided into three areas of interprofessional education: 1) collaboration and teamwork, 2) sense of professional identity, and 3) patient-centeredness. Each of the interprofessional areas was measured as: 1 Strongly Disagree, 2 Disagree, 3 Neutral, 4 Agree, and 5 Strongly Agree.

Table 1. Correlation between basic interprofessional competencies (N: 40). La Serena, Chile, 2023

	Clarification of Roles	Patient-centered care	Teamwork	Collaborative leadership	Communication	Conflict resolution
Clarification of roles	1	0.406**	0.492**	0.438**	0.425**	0.413**
Patient-centered care	0.406**	1	0.448**	0.363**	0.354**	0.418**
Teamwork	0.492**	0.448**	1	0.593**	0.566**	0.620**
Collaborative leadership	0.438**	0.363**	0.593**	1	0.443**	0.675**
Communication	0.425**	0.354**	0.566**	0.443**	1	0.541**
Conflict resolution	0.413**	0.418**	0.620**	0.675**	0.541**	1

Caption: **The correlation is significant at the 0.01 level (two tails).

Source: Statistical Package for Social Sciences - SPSS (2023).

The results showed that most students (N:40) agree with interacting with other students in their learning process. If we break this down by areas of interprofessional education, we find that they strongly agree with collaborating and working in teams (M: 5, SD: 0.528). In terms of professional identity, where they get to know themselves and are socially recognized in terms of their role within the professional team, they rate this as neutral (M: 3, SD: 0.840) and totally agree with providing patient-centered care with other disciplines (M: 5, SD: 0.446).

Team performance during interprofessional simulation

The CAT is a reliable and valid tool used to assess how real patients perceive the ability of healthcare staff to communicate in a patient-centered manner. It consists of 14 descriptions rated on a 5-point scale (1 poor; 5 excellent), which facilitates understanding. The results are presented as the percentage of items rated as "excellent."

The results showed that students obtained an average percentage of 76.3% (SD \pm 40.2; range 45-100%) for each of the workshops. If we break down the CAT results by degree program, we can see the percentages of excellent results shown in Table 2.

The items with the highest percentage of "excellent" ratings were No. 2, No. 4, and No. 5. The lowest percentages correspond to items No. 7, No. 11, and No. 12.

Table 2. Average percentage of excellent grades per item and per degree program in the CAT. La Serena, Chile, 2023

Average % of excellent						
	Item	All	Nursing	Nutrition and Diet	Kinesiology	Occupational Therapy
1	Greeted me in a way that made me feel comfortable	87.5	82.4	75	100	100
2	Treated me with respect	100	100	100	100	100
3	Showed interest in my ideas about my health	72.5	82.4	50	87.5	57.1
4	Understood my main concerns about my health	90	82.4	87.5	100	100
5	Paid attention to me (looked at me, listened carefully)	92.5	94.1	87.5	87.5	100
6	Let me speak without interruptions	67.5	64.7	75	62.5	71.4
7	Gave me all the information I wanted	62.5	58.8	62.5	62.5	71.4
8	Spoke in terms I could understand	82.5	94.1	75	50	100
9	Made sure I understood everything they said	70	82.4	75	50	57.1
10	Encouraged me to ask questions	72.5	70.6	87.5	62.5	71.4
11	Included me in decisions to the extent I wanted to participate	45	29.4	37.5	75	57.1
12	Talked to me about next steps in my treatment, including follow-up plans	52.5	52.9	50	50	57.1
13	Showed interest and concern	87.5	88.2	87.5	87.5	85.7
14	Gave me the appropriate amount of time	85	88.2	87.5	100	57.1

Source: Author(s) (2023).

Satisfaction with the IP simulation training day focusing on person-centered communication

The satisfaction survey assesses students' level of satisfaction with their experience in the interprofessional clinical simulation workshops. The survey designed by the authors includes an evaluation of the activity, organization, contribution, likelihood of repeating the experience, and materials provided from the students' perspective, which allows us to identify areas that need improvement or can be improved to increase student satisfaction and loyalty. The aforementioned dimensions were measured as:

- Evaluation and organization of the activity: 1 very poor, 2 poor, 3 fair, 4 good, and 5 very good.
- Contribution to professional development, willingness to repeat the experience, and quality of the material provided: 1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, and 5 strongly agree.

The results showed that the majority of students (N:40) found the experience to be very good (77.6%), the organization of the activity was very good (60.5%), strongly agreed that interprofessional clinical simulation contributes to their professional development (91.7%), strongly agreed that the activity should be repeated (76.8%), and strongly agreed with the quality of the material provided and its timely delivery (77.6%).

Student and facilitator experiences with IP simulation

During the focus group, participants explored their experiences in the interprofessional simulation workshops, relating the simulated experiences to real-life practice. Aspects such as communication, teamwork, conflict resolution, and interprofessional education were addressed, and their impact on clinical training was evaluated. The results of the reflection are presented here.

Communication

The instructors, and especially the actress, recognized effective communication among the participating students during the clinical simulation, noting that communication is a fundamental skill within interprofessional competencies. Within this category, students highlighted the existence of effective communication with the user, emphasizing various dimensions such as empathy, active listening, clarity, and respect. It is important to note that students not only value communication with the patient, but also communicative interaction between different disciplines, as mentioned by Nutrition and Diet student 2.

As nursing students, we need to have communication skills and confidence in our approach. We need to know how to communicate correctly what we want to convey to patients. (Nursing student 1)

It is crucial to organize the content for effective communication and ensure that it is clear and understandable. To analyze this, feedback should be sought from the user, and what has been learned should be evaluated. (Kinesiology student 3)

It is necessary to understand the patient's social and psychological situation before entering and to use verbal and nonverbal language that is easy for the user to understand. (Nursing student 4)

It was enriching to learn about what other disciplines do, the different and fundamental roles of other health careers, and to be able to communicate with each other so that we knew who would intervene and that roles would not be mixed. It was a wonderful experience. I hope that all students can experience the simulation. An instance with actors is much better than just with mannequins or among the students themselves. (Nutrition and Diet Student 2)

Roles and responsibilities

During the focus group, the instructors and the actress identified a category they called cognitive competencies, which highlights roles and responsibilities. The students mentioned that they feel familiar with their own role but are unaware of the responsibilities of other subjects. Some observed that the education provided to the user sometimes coincided with the instructions of another professional, but they managed to maintain consistency throughout the process. The students emphasize the importance of establishing conversations prior to interacting with the patient to clearly define the roles and expressions of each team member.

To provide education that is effective and practical, considering our future jobs, it is important to respect and understand each other's roles. (Nursing student 6)

The opportunity to coordinate and support other departments, resolve situations quickly through teamwork, and learn from other professions in the field of customer service. (Occupational Therapy student 1)

Likewise, as I mentioned strength, the issue of focusing on our area is sometimes complicated, since we all have a basic understanding of other professions, and, because we want to be helpful to patients, we talk too much. That is why it is extremely important to focus on what we do. (Kinesiology student 1)

Being able to discuss the roles of each profession with other classmates prior to the scenario so that it is easier to identify and organize them. (Kinesiology student 2)

Collaboration

This category has been named Relational Competencies by the facilitators and the actress, highlighting elements such as collaboration, conflict management and resolution, teamwork, and a collaborative approach focused on the patient and their family. Concerning collaboration, students recommend strengthening interaction between different fields in clinical simulation environments, to promote collaborative learning that translates into the development of this competency.

The interprofessional workshop allowed me to complement my studies in user care with different fields that share the same goal: the patient. (Nutrition and Diet student 3)

We were able to see the perspectives and viewpoints of different students, which helped us support the person so they can get better soon. I feel that more workshops that reinforce collaboration should be created. (Nursing student 2)

Conflict management/resolution

The students shared that a conflict arose when they found themselves providing patient education simultaneously; however, this conflict did not lead to an immediate discussion. Rather, this situation gave rise to an enriching collaboration where each student's contributions complemented and supported one another. Some experiences shared indicated that when the actress began to cry due to the intensity of the simulated

situation, the students were initially unsure of how to react. However, they found reassurance in the fact that professionals from other fields came together to provide her with emotional support, which proved to be a positive and cohesive aspect of the situation.

When my nursing colleague began the training, I noticed that she was explaining activities that are specific to my field, but I didn't say anything. When it was my turn to give the training, I reinforced and complemented what she had said, but from an occupational therapy perspective. (Occupational Therapy student 3)

I felt that there was a conflict between the disciplinary areas when she [the actress] cried. I felt that no one knew what to do, but Catalina [the nursing student] decided to hug her and tell her that everything would be okay, and then I felt relieved. (Kinesiology student 8)

Team operation

The students pointed out that to achieve an effective healthcare team, it is essential to recognize individual roles and determine who will lead the activity. This approach encourages effective discussions and dynamics, especially in interdisciplinary teams. They emphasized that collaboration among students contributes significantly to improving the quality and safety of patient care.

[...] interact and learn from other professions that contribute to comprehensive user care... Learn what other professionals do... This will lead to better communication between professionals in future practice. (Nursing student 7)

It provides us with the necessary tools to acquire a professional attitude and sense of purpose... Teamwork, skills to function in the healthcare field, and active listening. (Kinesiology student 4)

To better develop my soft skills [...]. Interpersonal work that will allow us to better navigate our role as a multidisciplinary healthcare team. (Occupational Therapy student 2)

[...] the issue of focusing on our area is sometimes complicated, since we all have a basic understanding of other professions, and, because we want to assist the patient, we tend to discuss other topics. Therefore, it is extremely important to focus on our area of expertise. (Nutrition and Diet student 2)

Collaborative approach focused on the individual/family

The students emphasized that they consider it essential in healthcare to always inform the user and their family, as well as to seek their opinion. They highlighted the importance of respecting beliefs, values, and care needs when developing healthcare plans, and also of acting as patient advocates, collaborating with them as partners in decision-making processes.

The role that each intern plays in their field is important. It is always important to be clear about what each of us is responsible for in our specialty, to know that a patient should be treated by each department, and to focus on our own department without interfering with our colleagues to provide optimal treatment. (Nursing student 2)

I would highlight that, together with other health professionals, we can complement each other and see the patient from different perspectives, always approaching them ethically and responsibly. (Nutrition and Diet student 4)

Multidisciplinary teamwork and respect for a biopsychosocial approach to patients... being able to understand the role of other professionals and how we interact with each other for patients' well-being. (Occupational Therapy student 4)

DISCUSSION

The interprofessional simulation consisted of evaluating communication skills focused on the patient/family and among health students, through the implementation of an improved approach to interprofessional education based on clinical simulation. The vast majority of students from the fields of kinesiology, nutrition, occupational therapy, and nursing experienced an enriching process by immersing themselves in activities specific to other disciplinary areas. This exercise provided them with a valuable opportunity to discover and understand the unique and fundamental roles that various careers play in the vast field of healthcare. The interaction between these different specialties allowed them to establish clear and effective lines of communication, thus contributing to a precise delineation of responsibilities and, crucially, avoiding any possibility of confusion regarding roles and functions.

It should be noted that the inclusion of actors in this experience proved to be considerably more enriching compared to traditional simulation using simulators or collaboration between classmates. In an initial phase, students demonstrated more ingrained knowledge in cognitive terms concerning patient/family-centered care, teamwork, and communication skills, findings consistent with previous studies¹³⁻¹⁵.

However, as the workshops became more complex, particularly in situations where the actress portrayed emotions such as crying, the ability to intervene as a team was challenged. This challenge arose due to the lack of training in crisis intervention and the limited application of interprofessional conflict resolution skills in an out-of-hospital setting, highlighting the correlation between these skills.

While it is important to note that this research did not adopt a controlled design that would allow for establishing a cause-and-effect relationship with a high degree of reliability, it is worth mentioning that the association observed between communication, teamwork, and conflict resolution skills suggests that increased exposure to interprofessional education simulations could effectively stimulate the progress of complex skills, such as conflict resolution. To this end, it is advisable to practice active listening, use clear and simple language, be empathetic, encourage questions, pay attention to nonverbal communication, and avoid distractions¹⁶⁻¹⁹.

Overall, this preliminary evaluation has provided a solid educational model for future simulations, which can be further strengthened by specifically addressing the challenges that arose during the study, such as designing workshops that effectively address crisis intervention and interprofessional conflict resolution training. In addition, the inclusion of more complex emotional situations, such as crying, should be considered to challenge students' communication and teamwork skills.

It is also important to provide opportunities to practice patient/family-centered communication skills, fostering empathy and understanding of individual needs. For teaching to be effective, students must train with simulated patients under supervision and direct observation, receive specific and personalized feedback from their subject teachers (co-debriefers) and from a debriefer acting as workshop facilitator, and have

shared learning experiences incorporated into the curriculum at an early stage. These recommendations are consistent with previous studies²⁰⁻²².

In real clinical practice, this interprofessional approach has a significant impact on the quality of care. By working collaboratively, healthcare professionals can more effectively address patients' complex needs, ensuring more comprehensive, patient-centered care and contributing to the quality of care in society. Interaction between different disciplines in the clinical setting allows for better decision-making and a coordinated approach that optimizes treatment outcomes.

This research had a small sample size and did not adopt a controlled design that would allow a cause-and-effect relationship to be established with a high degree of reliability.

CONCLUSION

The research proved to be an effective strategy for promoting the development of interprofessional competencies among health faculty students. This experience allowed them to better understand the roles and duties of other disciplines, strengthen teamwork and communication skills, and face challenges and conflicts inherent in interprofessional care.

Although the small sample size prevents definitive conclusions from being drawn, it is recommended that, to improve communication among health professionals, communication skills should be developed with the participation of simulated patients, clinical simulation should be used, and its early integration into the curriculum should be ensured. These strategies will contribute to better collaboration and coordination among health professionals, which in turn will benefit patient care. This study allows for the projection of future lines of research that could focus on the development of multicultural, cross-cutting interprofessional skills and interventions in health crises, among others.

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