

International Journal of Nursing and Health Care Research

Silén-Lipponen M and Saaranen T. Int J Nurs Health Care Res 04: 1241.

DOI: 10.29011/2688-9501.101241

Research Article

Reflection as a Factor Promoting Learning Interprofessional Collaboration in a Large-group Simulation in Social and Health Care

Marja Silén-Lipponen^{1*}, Terhi Saaranen².

¹Principal lecturer, Savonia University of Applied Sciences, Unit of Health Care, Kuopio, Finland

²Professor, PhD, University of Eastern Finland, Faculty of Health Sciences, Department of Nursing Science, Kuopio, Finland

***Corresponding author:** Marja Silén-Lipponen, PhD, Principal lecturer, Savonia University of Applied Sciences, Unit of Health Care, Kuopio, P.O Box 6, FI-70201 Kuopio, Finland

Citation: Silén-Lipponen M, Saaranen T (2021) Reflection as a Factor Promoting Learning Interprofessional Collaboration in a Large-group Simulation in Social and Health Care. Int J Nurs Health Care Res 04: 1241. DOI: 10.29011/2688-9501.101241

Received Date: June 11, 2021; **Accepted Date:** June 25, 2021; **Published Date:** July 02, 2021

Abstract

Aim: The purpose of this study was to describe the experiences of learning interprofessional collaboration among students and professionals who participated in a social and health care large-group simulation organized online.

Background: Gathering interprofessional (IP) experiences is already important during education, because joint education increases IP understanding and clarifies the responsibilities of different professionals. This study illustrates that the use of a large-group simulation, even online, can increase students' and professionals understanding of IP collaboration. The large-group simulation concerned encountering a client who was a victim of domestic violence and had substance abuse problems.

Design: Case study

Methods: Research data were collected with a questionnaire containing variables on a five-point Likert scale and open questions. The questionnaire was filled out online by 214 students and professionals. The quantitative data were analyzed using descriptive statistical methods and the open-ended questions by inductive content analysis.

Results: The study increased knowledge of the meaning of IP communication. However, participants' experiences of learning real-life work situations varied. Using large-group simulation as an educational method provided opportunities for reflecting collaboration alone and together with other IP simulation participants, which promoted development of collaborative professional attitudes and skills. Moreover, the use of professionals in the roles of the IP team increased the participants' ability to integrate theory into practice.

Conclusion: The knowledge produced in this study can be used in designing simulations in basic and continuous education.

Keywords: Interprofessional collaboration; Education; Social and health care simulation; Teaching

training working together in an aim to provide the best possible care for patients [2].

For the development of IP collaboration, it is important that students already gather experiences of interprofessional education (IPE) during their studies, as joint education reduces professional prejudices [2] and clarifies the responsibilities of professional groups [3]. However, health and social care education offers few opportunities for students to learn together with different professionals before entering the workforce [4,5]. The challenges of IPE include the coordination of education schedules, the booking

of facilities and the lack of a common strategy in educational collaboration between different disciplines [6,7].

IP simulations have been found to provide effective and realistic learning situations [8] that enable learning health and social care collaboration skills safely [4] and applying theoretical knowledge into practice [9,10]. Previous IPE simulations have provided information on the duties of other professionals [11] and the dynamics of IP teams [12]. In addition, educational collaboration has helped broadening the understanding of patient care processes, prioritizing customer needs [13-15] and clarifying the division of work between professionals [8,13].

Simulation as an experiential and authentic learning method promotes reflection that strengthens in-depth learning [16,17]. Overall, reflection describes active processes that are often triggered by the theory-practice gap, in which students describe the situation they have observed, pay attention to their emotional reactions and examine their thoughts and feelings internally [18]. Furthermore, students analyze and critically evaluate their behavior and plan new actions based on the reflection. Through the reflection process, students become more aware of themselves and their clinical skills, which makes them better equipped to acquire self-directed learning skills and obtain professional maturity [19].

Reflection takes place in *all the phases of a simulation: briefing, simulation activities and debriefing*. The briefing phase involves assistance, orientation or introduction of learners to outlining scenario objectives and providing them with information about the environment where the scenario takes place [20,21]. Briefing helps the participants understand the rationale for care, encourages them to widen their understanding of the upcoming situation and gives information about the content of the simulated scenario [22]. Moreover, briefing involves familiarization with technology, equipment and the opportunities and limitations of the scenario [23]. These introducing activities aim to minimize student anxiety and prepare them to detect cues embedded in the scenario and reinforce them to revise their ways of thinking [24-26].

The *simulation activities* offer learners opportunities to develop their problem-solving and reflection skills by promoting the transfer of knowledge and skills into practice. Reflection takes place during the simulation as either actors or observers. The actors participate in the simulation in given scenario roles, which mimic the realistic nursing environment. The observers follow the simulation based on the set objectives, make observations of the events and prepare to comment on their experiences in the debriefing [27,28].

A structured *debriefing* promotes reflection by learning to self-correct and assimilate new and previous experiences

in improving professional competence [16,17,29]. The steps included in the debriefing usually include description, analysis and application phases (Figure 1), which involve discussing feelings and reactions related to the scenario, positive behavior detected during the simulation as well as activities that need to be developed, and a summary of how the gained knowledge is transferred into clinical practice [22,30].

In the description phase of the debriefing, students freely express their emotional reactions to the simulation experience, while a facilitator guides the reflection by providing a safe environment for openness by giving feedback in an encouraging and positive way [29,31]. In the analysis phase, the students identify behaviors in the simulated scenario that have facilitated or impaired the clinical intervention and describe their thoughts and knowledge related to the simulation activities. As the students gain insight into their mental models and behavioral responses, in the application phase, the instructor prompts them to connect new learning content to larger clinical environments and projecting these to future clinical experiences. This scaffolding approach, in which the instructor facilitates the reflection, intends to solidify the learners' knowledge and skills [32,33].

It is particularly important to connect reflection activities to learning objectives and that these foster all affective, cognitive and psychomotor domains of learning [34,35]. Reflection is said to be effective when it happens within a continuous time frame, is connected holistically to the content of learning, challenges previous assumptions and complacency, and is contextualized in a specific setting. A continuous time frame can be promoted through means such as planning opportunities for reflection before, during, and after experiences [36]. These opportunities help students explore any questions, challenges, and insights that arise over time.

Simulations are usually performed in small groups of about 6–20 participants [37,38]. A dramatized large-group simulation utilizing actors and professionals representing various fields, can be carried out in front of hundreds of learners. It follows the pedagogical solutions of the small-group simulation (Figure 1), where reflection is included in the different simulation phases, briefing, simulation in action and debriefing. Instead of actively participating in acting out the simulated scenario, the simulation participants follow it as observers [39]. In the study by Cunningham and Cunningham [40], no statistically significant difference was found in the learning outcomes of participating and observing students. Moreover, students can learn IPE collaboration by observing the work of others, provided that the tasks given to the observers support learning in accordance with the learning objectives [41].

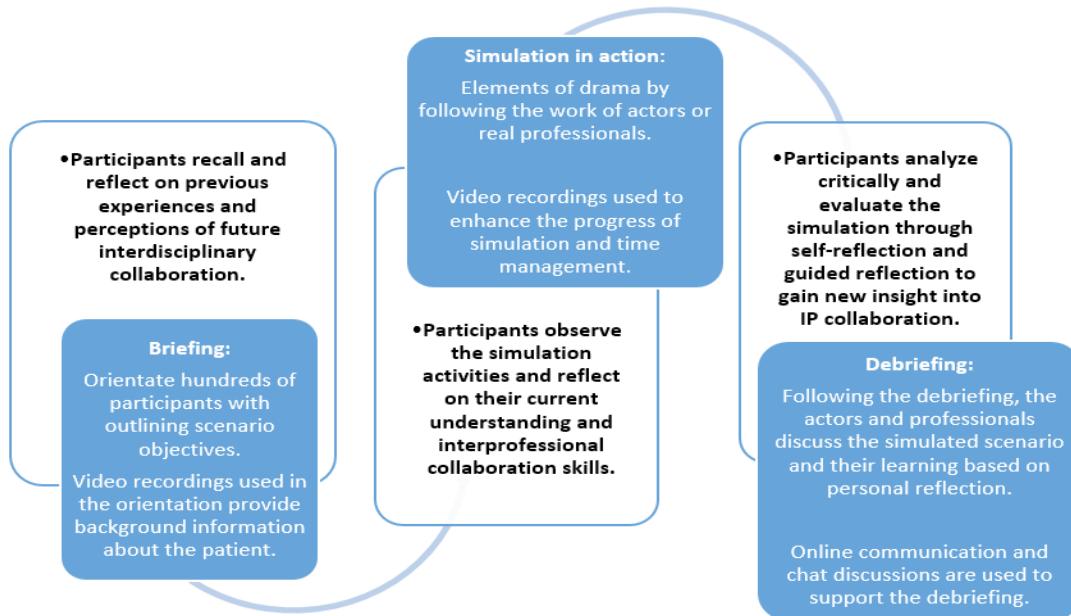


Figure 1: Fostering reflection during briefing, simulation in action and debriefing in the large-group simulation.

Observation can be supported by using video recordings [42]. Observing professionals in the roles of health care personnel has also been used to indicate the flexibility of patient care and has been found to promote the development of clinical decision-making among students [43-45]. While some previous research has concerned the use of virtual technologies, e.g. e-simulation and video simulations in nursing education [46-48], there is not enough knowledge of how to implement large-group simulations into online healthcare education and how learning in large groups affects students' IP competence.

This article describes IPE in an online large-group simulation. The research focuses on the learning of IP collaboration and the factors that promote or impair the reflection of learners. The obtained knowledge can be particularly utilized by health and social care educators who facilitate and evaluate students' learning of IP collaboration and who are involved in curriculum development.

Method

The purpose and the study questions

The purpose of this study was to describe the experiences of learning interprofessional collaboration among the students and professionals who participated in an online social and health care large-group simulation. The study questions were:

1. What sorts of experiences did the participants have of learning interprofessional collaboration in a large-group simulation?

2. What factors promoted or impaired about the process of reflecting on the collaboration among participants during the online large-group simulation?

The large-group simulation and participants of the study

The participants of this simulation were students and professionals representing health and social care. The simulation was part of a voluntary course in the students' curricula, and professionals were also invited. In total, 440 students and professionals participated as observers in the online simulation. Before the simulation, the participants received preliminary learning material about the scenario and instructions about using their mobile devices for communicating during the simulation.

The scenario was designed and scripted for the large-group simulation in a team consisting of members from health and social sciences and a professional actor. The setting for the scenario was IP collaboration in social and health care with a client, a 40-year-old woman who was a victim of domestic violence and who also had substance abuse problems. A professional actor played the client, while a medical doctor, social worker, substance abuse therapist and crisis psychologist performed their own professional roles.

The simulation briefing began by showing videos of the client's various contacts with social and health care professionals in recent weeks. The simulation in action consisted of an interdisciplinary meeting with the client and professionals and lasted around 30

minutes. After the simulation, an instructor led the subsequent debriefing which had the duration of roughly 40 minutes. The participants followed both the simulation and debriefing online and were able to join the discussion anonymously in real-time using a mobile application. Written comments made by the participants were displayed online and were visible for everyone at the event.

Data collection

All of the participants (students and professionals) were given a link to an online questionnaire during the large-group simulation. The questionnaire used in this study included 7 background questions and one structured question with nine five-point Likert-scale variables (completely agree - completely disagree) about the experiences of IPE during the large-group simulation. In addition, the questionnaire included 7 open-ended questions concerning the participants' views of the simulation from the point of view of reflection. This article reports the results of background variables (gender, age, participation role in the simulation as a student or professional and professional field, the participants' experiences

through one structured question (the statements of learning IP collaboration, Table 1) and three open-ended questions of the simulation from the point of view of reflection.

Data analysis

The quantitative data were analyzed with IBM Statistic version 24 using descriptive statistics. The background variables were described using frequencies and percentages. The quantitative results of IPE based on exploratory factoring were formed into two sum variables: learning of interprofessional collaboration competence and interprofessional large-group simulation as a learning method. Learning of interprofessional collaboration competence included 9 statements and interprofessional large-group simulation as a learning method 6 statements (Table 1). The individual Likert-scale variables were classified into three categories (agree, cannot say and disagree). The results describe the means and variances of the sum variables and the percentages of the individual statements. A significance level of 0.05 was adopted for statistical analyses.

Sum variables /Statements	Component Loading	Communalities Extraction	Cronbach's alpha
Learning of interprofessional (IP) collaboration competence			0.89
S2. The IP large-group simulation clarified the task descriptions of professional groups	0.565	0.357	
S3. The IP large-group simulation increased the appreciation of professional groups	0.603	0.550	
S4. The IP large-group simulation strengthened my knowledge of the significance of collaboration skills	0.729	0.653	
S5. The IP large-group simulation increased my knowledge of the significance of collaboration as part of patient safety	0.728	0.592	
S6. The IP large-group simulation strengthened my knowledge of IP problem solving	0.673	0.534	
S7. The IP large-group simulation strengthened my knowledge of the significance of patient-centred encounters and care	0.806	0.677	
S8. The IP large-group simulation strengthened my knowledge of the significance of interacting with the patient	0.769	0.669	
S9. The IP large-group simulation helped me understand the patient's overall situation	0.768	0.600	
S14. The IP large-group simulation increased my knowledge of real-life situations in working life.	0.618	0.470	
Interprofessional (IP) large-group simulation as a learning method			0.82

S1. The learning objectives set for the IP large-group simulation were clear	0.666	0.454	
S10. The large-group simulation was a good method for learning IP collaboration	0.613	0.518	
S11. The IP large-group simulation was a learning method sufficiently activating the participants	0.767	0.626	
S12. Carrying out an IP large-group simulation remotely was suitable for IP learning	0.810	0.698	
S13. The interprofessional large-group simulation was a suitably challenging learning method as it made the participants examine IP work from new perspectives	0.646	0.555	
S15. IP large-group simulation encourages students from different fields to also work together after their education as they enter the workforce	0.622	0.481	

S=Statement

Table 1: Statements, component loadings, communalities extractions and Cronbach's alphas of learning of IP collaboration.

Qualitative data were analyzed by inductive content analysis. The authentic expressions were reduced and grouped according to their content. Reduced expressions with similar content were grouped and classified into seven subcategories which were named according to their content. The subcategories were then compared and categories with similar content integrated into three upper categories, which were finally integrated into a single main category [49,50].

Validity

This study used both quantitative and qualitative research method, which enabled producing a wide perspective of the study phenomenon [50]. The questionnaire was developed in an IP group including research and teaching personnel from the disciplines of pharmacy, nursing, medicine and social sciences. The developed questionnaire has been previously used in large-group simulations in 2017 [39], 2018 and 2019; and was further developed for this research. The reliability of the questionnaire has been assessed by experts from an IP research team. The survey response rate was 49%, which can be considered reasonable for an online survey.

Ethical considerations

The research process was granted ethical permission (Statement 6/2016) by the Committee on Research Ethics of the University of Eastern Finland. To protect privacy and personal data, the process complied with the EU General Data Protection Regulation [51] and the Data Protection Act [52]. The participants were provided with information about the interprofessional large-group simulation in materials sent to them before, and orally during, the large-group simulation, when the participants received a written bulletin about the study in connection with the online questionnaire. Participation in the study was voluntary and the research data were collected, analyzed and stored without personal

identifying data. The data were stored in a protected cloud storage service in accordance with the university's guidelines.

Findings

3.1 Background information

Of the participants in the IP large-group simulation in the social and health sector (N = 440), 214 participants filled out the survey. The respondents were mainly women (92%) and half of the participants (49%) were aged under 29 years. The participants were mainly students (89%), while 11% were already employed in social and health care. Of the students, 72% studied in a university (health sciences, dentistry, pharmacy, and social sciences, including social work), 20% in a university of applied sciences, and 8% in other educational institutions (e.g. in health and social care, upper secondary education). The health and social care professionals mainly represented pharmacy, health sciences (e.g., expert, manager, teacher), nursing (e.g., nurse, midwife, oral hygienist, community nurse), and social work (e.g., expert, manager, social worker).

Learning of interprofessional collaboration

The participants rated their experiences of learning IP collaboration competence as very good (mean: 4.33). The large-group simulation had particularly promoted strengthening knowledge of the significance of collaboration skills (95% of the participants agreed). Moreover, the IP large-group simulation strengthened the participants' knowledge of the significance of interacting with the patient (93% of the participants agreed). However, the participants' opinions about how the IP large-group simulation highlighted the understanding of the real-life situations in working life differed somewhat; of the participants, 85% responded that they agreed with the statement, while 6.5% disagreed (Table 2).

Sum variables /Statements	Responses						Mean	SD		
	Disagree		Neither agree nor disagree		Agree					
	n	%	n	%	n	%				
Learning of IPC competence							4.33	0.56		
S2. The IP large-group simulation clarified the task descriptions of professional groups	8	3.8	32	15.0	173	81.2	4.02	0.758		
S3. The IP large-group simulation increased the appreciation of professional groups	3	1.4	24	11.3	186	87.3	4.28	0.737		
S4. The IP large-group simulation strengthened my knowledge of the significance of collaboration skills	3	1.4	8	3.8	202	94.8	4.54	0.662		
S5. The IP large-group simulation increased my knowledge of the significance of collaboration as part of patient safety	5	2.4	17	8.0	190	89.6	4.43	0.76		
S6. The IP large-group simulation strengthened my knowledge of interprofessional problem solving	6	2.9	19	9.0	186	88.1	4.33	0.776		
S7. The IP large-group simulation strengthened my knowledge of the significance of patient-centred encounters and care	2	1	20	9.4	191	89.6	4.4	0.718		
S8. The IP large-group simulation strengthened my knowledge of the significance of interacting with the patient	15	0.9	72	6.2	335	92.9	4.5	0.699		
S9. The IP large-group simulation helped me understand the patient's overall situation	5	2.4	20	9.4	188	88.2	4.34	0.764		
S14. The IP large-group simulation increased my knowledge of real-life situations in working life	14	6.5	18	8.5	181	85	4.19	0.929		

S = a statement

Table 2: Learning of interprofessional (IP) collaboration competence.

95% of the participants were satisfied with the large-group simulation as a learning method and also rated it successful when carried out remotely (94%). Furthermore, the IP large-group simulation methodically encouraged students from different fields to continue working together after completing their education as they enter the workforce (94% of the participants agreed) (Table 3).

Sum variable / Statement	Responses						Mean	SD		
	Disagree		Neither agree nor disagree		Agree					
	n	%	n	%	n	%				
Interprofessional (IP) large-group simulation as a learning approach							4.31	0.558		
S1. The learning objectives set for the IP large-group simulation were clear	11	5.2	28	13.1	174	81.7	4.08	0.823		
S10. The large-group simulation was a good approach for learning IP collaboration	3	1.4	7	3.3	201	95.3	4.64	0.641		
S11. The IP large-group simulation was a learning approach sufficiently activating the participants	19	9.0	36	17.0	157	74.0	4.01	0.959		
S12. Carrying out an IP large-group simulation remotely was suitable for IP learning	3	1.4	10	4.7	199	93.9	4.49	0.678		

S13. The IP large-group simulation was a suitably challenging learning approach as it made the participants examine interprofessional work from new perspectives	9	4.3	28	13.3	173	82.4	4.13	0.851
S15. IP large-group simulation encourages students from different fields to also work together after their education as they enter the workforce	1	0.5	11	5.2	198	94.3	4.52	0.641

S = a statement

Table 3: Interprofessional large-group simulation as a learning approach.

Factors promoting and impairing reflection

The analysis of the answers to the open-ended question resulted in forming the main category of *factors promoting reflection in the large-group simulation* (Figure 1). The main category comprised the following categories: *realism of the large-group simulation*, *various sensory channels supporting learning* and *simulation carried out remotely*.

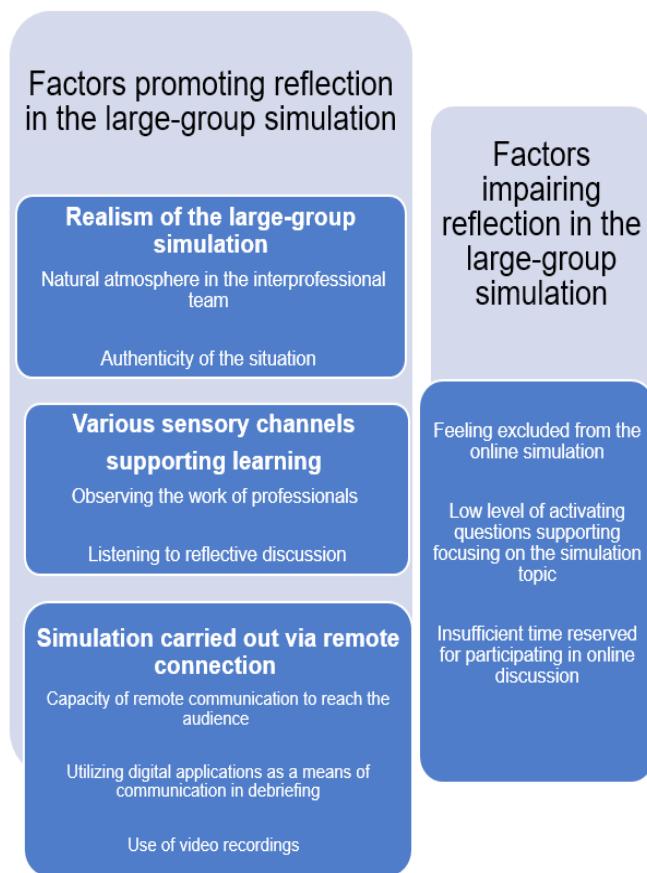


Figure 2: Factors promoting reflection in the large-group simulation.

The **realism of the large-group simulation** was promoted by a natural atmosphere in the interprofessional team. The client was placed at the core of the activities, and encountered in a tolerant, understanding and friendly manner. To engage the client in the debriefing, the team carefully listened to her and made room for the client to express her emotions and life situation.

"How client was taken into consideration, what sorts of questions were posed and how information was gathered about the situation."

"Professionals must listen carefully what clients are saying, see people as a comprehensive whole and pay attention to any abnormal behavior."

The large-group simulation had succeeded in creating a situation that felt genuine and a realistic client case immersive to the participants. Learning interprofessional collaboration skills was promoted by hearing an authentic client perspective of how relieved the person had been when the team openly addressed sensitive issues.

"The realistic simulation of a meeting between social and healthcare staff made the concept of interprofessional collaboration concrete."

Reflecting how difficult themes are encountered was educational as was considering how I would personally act in the situation or how I would like for others to act if I was the one encountering a difficult issue."

According to the participants, the **use of various sensory channels promoted learning**. Observing the work of professionals enabled focusing on the different stages of work and reflecting on the ideas emerging from the situation without any haste. The unpredictability marking the simulation and spontaneous reactions to situations also activated analytical examination of its content. Dialogue between videos and discussions boosted the progress of the simulation and created a learning situation where students could learn by examining the work of professionals in a safe environment.

"Almost like in practice, you could see how collaboration could work and how it takes off."

"You can only learn interprofessional work in practice, but this large-group simulation gave a good snapshot into what you might expect and what international collaboration is actually like."

Listening to the reflective discussion expanded the participants' understanding of the interprofessional approach. Learning reflection was enhanced by the consideration of professionals who had been working in client and interprofessional work for years from the perspectives of their professional roles as well as their views of what had gone well and what they could have done differently. Views in line with the professionals' and learners' perspectives, but also viewpoints different from these, promoted understanding of the phenomena underlying the decisions made in the simulation. Listening to the professionals' experiences in the interprofessional debriefing also helped the participants acknowledge the individual nature of client situations and the uncertainty these contained.

"Understanding that all situations are unique and are realized

with the resources and interactions that are available in a given moment."

"Many of the comments expressed in the debriefing were ones that had been on my mind subconsciously but that I had been unable to put into words."

"Various perspectives that were different from mine made me think critically about the way I encounter clients."

The participants found that **learning in the simulation carried out remotely** was pleasant. The *remote connection succeeded in reaching the audience* both physically and emotionally. Some participants assessed that they could thoroughly immerse themselves in the simulated scenario and that physical presence at the simulation would not have produced any added value or enhanced learning IP collaboration. Some even felt that they had found it easier to focus on the simulation when it was realized remotely compared to physical presence in a large classroom, as a peaceful environment at home had provided them with a better opportunity for reflecting on their learning.

"I could not have imagined that the event was going to run so smoothly, it was as if I had been right there in the room with them. You could sense the atmosphere and all the content at your home."

Utilizing digital applications as a means of communication in debriefing fostered interactive features in the large-group simulation. This was a tool for giving instant feedback and voting when the aim was to investigate the participants' experiences and opinions. Utilizing digital applications also promoted joint reflection in the group. The participants found it interesting to follow the debriefing as it enabled them to reflect on their own experiences and views related to ideas presented by others. The participants found the topic of the simulation, domestic violence, a highly sensitive subject, and some even felt that discussing the topic was easier when it could be done anonymously online. *Using videos as part of the large-group simulation promoted learning as they were emotionally appealing.*

"You could watch the situation safely from the other side of the screen and learn about the situation before you actually encounter it in real life."

"It was good that we could comment anonymously."

The answers of the open-ended questions only highlighted some experiences, which undermined reflection. (Figure 2). Even though the debriefing progressed smoothly, some participants felt like outsiders in the simulation carried out via a remote connection. These participants estimated that the debriefing promoting reflection would be more effective if the participants had an opportunity to participate in it in person. The participants did not always know when the discussion had moved on from one topic to the next, which could result in interrupting their reflection

on a given topic. The spar of activating questions also impaired reflection. The learners' focusing on essential topics could have been promoted if students were provided with questions on key issues that they could have concentrated on when watching the simulation. Small-group discussions between videos could also have activated the audience and further promoted their reflection. The reflection was also hindered by the abundance of content in the large-group simulation and not reserving enough time for joint online discussion.

"The large-group simulation had over four hundred remote participants, and as a result, our thoughts and ideas were only briefly discussed."

"Focusing on the simulation remotely was more challenging than in a live event, so there could have been more activating questions."

"The simulation progressed too quickly and there was not enough time to analyse everything you learned."

Discussion

This study produced significant knowledge of IPE concerning a large-group simulation as a new pedagogical method. Based on the results, the participants rated their experiences of learning IP collaboration as successful (Table 3). Previous studies have primarily concerned small group simulations or simulations with around 20 to 50 learners at the same time [23,38,53].

As a new learning method, the large-group simulation supported learning IP competence development. Similarly as in Verkuyl et al.'s [54] study, the present study showed that group discussion, even online, is an in-depth method for getting new perspectives on participants' own experiences. As it would not have been possible for hundreds of people to all be given turns in participating in the conversation, digital applications were used to support observations. Demonstrating opinions or posing question online proved to be even more effective than talking, because the answers could be shared on the computer screen. In this study, psychological safety was also mentioned as a requirement for deep reflection. This could be ensured in the online environment, as it enabled the participants to participate in the discussion anonymously and by also decreasing stress in the group debriefing. Previous studies have shown that psychological safety is an essential feature of simulation, as emotions influence learning, e.g. a fear of mistakes can have a negative effect on learning. Positive learning is dependent on an atmosphere which can improve both problem-solving and skill acquisition by experience and even learning from mistakes [55].

Based on the quantitative results of this study, around 7% of the respondents felt that their understanding of real-life situations did not improve. Some may have considered having such a large IP team gathering to discuss the client's situation unrealistic in

terms of practical implementation due to real-life difficulties in coordinating the schedules of various professionals to meet the client at the same time. Nevertheless, teaching has an ethical responsibility to also present ideal and rare models of reality, as new ideas and positive learning processes can improve the quality of care [2].

However, in the qualitative results of the study, the realism of the simulation was mentioned as an element supporting the large-group simulation. In this context, realism was supported by the use of an actor and professionals. Actors are commonly used in the roles of standardized patients in health education and have been found to foster learning [56,57]. In simulation, realism is also increased by preparing an authentic manuscript for the scenario and including interaction situations that prepare students to consider both positive aspects and issues where there is room for development [58]. This large-group simulation was designed in an IP group, its topic was central to the perspective of health and social care, and the connection between the simulation objectives and learning experiences were widely present in the students' reflections.

In this large-group simulation, the participants acted as "outsiders to the situation", observing the collaboration with professionals representing different disciplines and deepening their understanding that a single professional could not solve the customer's problems alone. On the other hand, the simulation showed how different professionals direct their attention to different aspects of care, which helped the participants understand the meaning of collaborative prioritization of care. This study found that the professionals' honest discussion during the debriefing promoted participants' reflection, e.g. in identifying knowledge gaps and making connections between the theory and practice of IP collaboration. Earlier research has also shown that following persons in the roles of patients or caregivers strengthens affective, motor and cognitive learning [41] and increases self-awareness in both individual [59] and group debriefing [60].

It is also essential that reflection is guided by learning outcomes, respects various perceptions that are considered together [61], and addresses the emotions that the participants have felt during the simulation. The reflective discussion also includes giving and receiving critical feedback relevant to the learning objectives [58]. The tone of the feedback should be enquiring, allowing the learners to expose operations and present their reactions [62]. In this study, the simulation was not perfectly performed and the debriefing was guided with questions based on the objectives of the simulation. This approach succeeded in obtaining knowledge about IP collaboration relevant to the working life.

This study only detected a few factors impairing the learning of IP collaboration detected. These included a lack of time for thorough group debriefing and briefly missing the required

guiding questions when observing the simulation. By contrast, in a study by Verkuyl et al. [54], 20 minutes was deemed too long for self-debriefing. The time required for debriefing usually varies depending on the content of the simulation and the use of videos as part of the activities. However, as individual learning styles affect learning, using only one debriefing method is not effective for all learners. Therefore, facilitators aiming to maintain deep reflection should use various debriefing methods. Students who have an assimilating learning style may prefer personal reflection over people-oriented activities, while students with a different learning style may be able to look at learning from various perspectives and appreciate group debriefing to get ideas from other participants' points of views [63]. Earlier literature also supports the use of educational tools to aid reflection during the debriefing [58], for instance preliminary questions or writing exercises [59]. However, there is no clarity on confidentiality regarding the self-debriefing tasks, even though reviewing the tasks may provide insights into the students' thoughts [60].

More research is needed to determine what kinds of educational resources are suitable for self-debriefing and how to use the time allotted for the whole simulation effectively. Moreover, research is needed to clarify how student-centered reflection can be implemented in the optimal way. This study was conducted using the large-group simulation method, and further research is needed to determine if the same results would be obtained from a small group.

Strengths and Limitations

The online large-group simulation allowed evaluating the effect of IPE in social and health care. The data were analyzed by using quantitative and qualitative methods, which may be a possible strength of this study. The mixed-method approach produced rich and versatile data and may have reduced the risk of a bias [50]. The qualitative data was considered sufficient for the study purpose and the findings reflected the participants' experiences. The quotations are representative samples of the data and indicate the trustworthiness of the results. Using a structured questionnaire, which had been previously used four times and modified based on the previous results, was a strength of this study. As research questions matched the data collection and analysis methods, methodological coherence was obtained [50]. This study had also some potential limitations. While the study generally focused on IPE in social and health care, the questionnaire was not filled out by many medical students and professionals. Due to a lack of responses from professional groups such as physicians, the insight into the IP collaboration may be somewhat biased. The average sample size (49%) also limits the generalisability of the results.

Conclusion

This study found that the use of a large-group simulation offered to hundreds of participants can promote students' and professionals' development of IP collaboration in social and health care education. Observing the work of professionals increases reflection and deepens awareness of IP collaboration. There were only some factors which impaired the learning of IP collaboration. In order for IP large-group simulations to promote reflective learning, it is important to design the simulations in such a way that they guide the learning in the direction of the objectives and include sufficient time for debriefing and processing experiences. Debriefing could be fostered by using guiding questions and the means of different learning styles to ensure that all participants can achieve their full learning potential. The use of appropriate teaching technology in a large-group simulation can contribute to IP collaboration. Virtual simulations organized between campuses, cities and even worldwide is an important challenge for the further development of large-group simulation learning.

References

1. Garnheim BM, Shaw JM, Mansah M (2018). The use of interprofessional learning and simulation in undergraduate nursing programs to address interprofessional communication and collaboration: An integrative review of the literature. *Nurse Educ Today* 62: 118-127.
2. Garth M, Millet A, Shearer E, Stafford S, Merrell SB, et al. (2018) Interprofessional collaboration: A qualitative study of non-physician perspectives on resident competency. *J Gen Intern Med* 33: 487-492.
3. Lockeman K, Appelbaum N, Dow A, Orr S, Huff T, et al. (2017) The effect of an interprofessional simulation-based education program on perceptions and stereotypes of nursing and medical students: A quasi-experimental study. *Nurse Educ Today* 58: 32-37.
4. Costello M, Prelack K, Faller J, Huddleston J, Adly S, et al. (2018) Student experiences of interprofessional simulation: findings from a qualitative study. *J. Interprof. Care* 32: 95-97.
5. Fox L, Onders R, Hermansen-Kobulnicky C, Nguyen T, Myran L, et al. (2018) Teaching interprofessional teamwork skills to health professional students: A scoping review. *J. Interprof. Care* 32: 127-135.
6. Murdoch NL, Epp S, Vinek J (2017) Teaching and learning activities to educate nursing students for interprofessional collaboration: A scoping review. *J. Interprof Care* 31: 744-753.
7. Stanley K, Stanley D (2019) The HEIPS framework: Scaffolding interprofessional education starts with health professional educators. *Nurse Educ Pract* 34: 63-71.
8. Pinto C, Possanza A, Karpa K (2018) Examining student perceptions of an inter-institutional interprofessional stroke simulation activity. *J. Interprof Care* 32: 391-394.
9. Hovland C, Whitford M, Niederriter J (2018) Interprofessional education: insights from a cohort of nursing students. *J. Nurses Prof Dev* 34: 219-225.

10. Mai C, Wongsirimeteekul P, Petrusa E, Minehart R, Hemingway M, et al. (2020) Prevention and management of operating room fire: An interprofessional operating room team simulation case. *J Teach Learn Res* 16: 10871.
11. Naismith L, Kowalski C, Soklaridis S, Kelly A, Walsh C (2020) Participant perspectives on the contributions of physical, psychological, and sociological fidelity to learning in interprofessional mental health simulation. *Simul. Healthc* 15: 141-146.
12. Kuehn M, Huehn S, Smalling S (2017) Improving collaboration among social work and nursing students Through interprofessional simulation. *Creat Nurs.* 3: 179-183.
13. Fox L, Onders R, Hermansen-Kobulnicky C, Nguyen T, Myran L, et al. (2018) Teaching interprofessional teamwork skills to health professional students: A scoping review. *J Interprof Care* 32: 127-135.
14. Roberts FE, Goodhand K (2018) Scottish healthcare student's perceptions of an interprofessional ward simulation: An exploratory, descriptive study. *Nurs Health Sci.* 20: 107-115.
15. Smith L, Keiser M, Turkelson G, Yorke A, Sachs B, et al. (2018) Simulated interprofessional education discharge planning meeting to improve skills necessary for effective interprofessional practice. *Prof Case Manag* 23: 75-83.
16. Huun K (2018) Virtual simulations in online nursing education: Align with quality matters. *Clin Sim Nurs.* 22: 26-31.
17. Stanley C, Lindsay S, Parker K, Kawamura A, Samad Z (2018) Value of collaboration with standardized patients and patient facilitators in enhancing reflection during the process of building a simulation. *J. Contin Educ Health Prof.* 38: 184-189.
18. Mezirow J (1981) Critical theory of adult learning and education. *Adult Learning Quarterly* 32: 3-24.
19. Tashiro J, Shimpuku Y, Naruse K, Matsutani M (2013) Concept analysis of reflection in nursing professional development. *Nurs Sci* 10: 170-179.
20. Chamberlain J (2015) Prebriefing in nursing simulation: a concept analysis using Rodger's methodology. *Clin Sim Nurs* 11: 318-322.
21. Meakim C, Boese T, Decker S, Franklin AE, Gloe D, et al. (2013) Standards of best practice: Simulation standard I: Terminology. *Clin Sim Nurs* 6S: S3-S11.
22. Husebo S, Dieckmann P, Rystedt H, Soreide E, Friberg F (2013) The relationship between facilitators' questions and the level of reflection in post simulation debriefing. *Simul Healthc.* 8: 135-142.
23. Tosterud R, Hall-Lord ML, Petzäll K, Hedelin B (2014) Debriefing in simulation conducted in small and large groups - nursing students 'experiences. *JNEP* 4: 173-182.
24. Díaz Agea J, Martín Robles M, Jiménez Rodríguez D, Morales Moreno I, Viedma I, Leal Costa C (2018) Discovering mental models and frames in learning of nursing ethics through simulations. *Nurse Educ Pract* 32: 108-114.
25. Johnston S, Coyer F, Nash R (2017) Simulation debriefing based on principles of transfer of learning: A pilot study. *Nurse Educ Pract* 26: 102-108.
26. Page-Cutrara K (2014) Use of prebriefing in nursing simulation: A literature review. *J Nurs Educ* 53: 136-341.
27. McGaghie W, Issenberg S, Barsuk J, Wayne D (2014) A critical review of simulation-based Mastery learning with translational outcomes. *Med Educ* 48: 375-385.
28. Shin S, Park JH, Kim JH (2015) Effectiveness of patient simulation in nursing education: Meta-analysis. *Nurse Educ. Today* 35: 176-182.
29. Lavoie P, Pepin J, Cossette S (2015) Development of a post-simulation debriefing intervention to prepare nurses and nursing students to care for deteriorating patients. *Nurse Educ Pract.* 15: 181-191.
30. Fanning RM, Gaba DM (2007) The role of debriefing in simulation-based learning. *Simul Healthc* 2: 115-125.
31. Zigmont J, Kappus L, Sudikoff S (2011) The 3D model of debriefing: defusing, discovering, and deepening. *Semin Perinatol.* 35: 52-58.
32. Canney DS, Randolph SD, Molloy MA, Carter B, Cary MP (2017) Student-developed simulations: enhancing cultural awareness and understanding social determinants of health. *J. Nurs Educ* 56: 243-246.
33. Sawyer T, Eppich W, Brett-Fleegler M, Grant V, Cheng A (2016) More than one way to debrief: a critical review of healthcare simulation debriefing methods. *Simul Healthc* 11: 209-217.
34. Bambini D (2016) Writing a simulation scenario: a step-by-step guide. *Adv Crit Care.* 27: 62-70.
35. Holtsneider M, Park C (2019) Simulation and advanced practice registered nurses: opportunities to enhance interprofessional collaboration. *Adv Crit Care* 30: 269-273.
36. Schmidt N, Brown J (2016) Service learning in Undergraduate nursing education: Strategies to facilitate meaningful reflection. *J Prof Nurs* 32: 100-106.
37. Carson P, Harder N (2016) Simulation use within the classroom: recommendations from the literature. *Clin Sim Nurs.* 12: 429-437.
38. Rode J, Callahan M, Barnes B (2016) Assessing the value of large-group simulation in the classroom. *Clin. Sim. Nurs.* 12: 251-259.
39. Saaranen T, Silén-Lipponen M, Palkolahti M, Mönkkönen K, Tiihonen M, et al. (2020) Interprofessional learning in social and health care-Learning experiences from large-group simulation in Finland. *Nurs Open* 7: 1978-1987.
40. Cunningham S, Cunningham C (2019) Optimizing the observer experience in an interprofessional home health simulation: A quasi experimental study. *J Interprof Care* 6: 1-4.
41. Nyström S, Dahlberg J, Hult H, Abbrandt Dahlgren M (2016) Observing of interprofessional collaboration in simulation: A socio-material approach. *J Interprof Care* 30: 710-716.
42. Davis D, Koppelman D, Gordon J, Coleman S, Heitzler E, et al. (2018) Effect of an academic – community partnership simulation education program on quality and safety education for nurses' competency domains for bachelor of science in nursing students. *Clin. Sim Nurs* 18: 56-63.
43. Lasater K, Johnson E, Ravert P, Rink D (2014) Role modeling clinical judgment for an unfolding older adult simulation. *J Nurs Educ* 53: 257-264.
44. DeMarco L, Panzarell K, Ferro H, Pownall I, Case A, et al. (2015) Outcomes of an interprofessional simulation curriculum. *JARHE* 7: 453-468.
45. Ward LD, Bray BS, Odom-Maryon TL, Richardson JP, Woodard LJ, et al. (2016) Development, implementation and evaluation of a longitudinal interprofessional education project. *JIEP* 3: 35-41.

46. Bogossian F, Cooper S, Cant R, Porter J, Forbes H, et al. (2015) A trial of e-simulation of sudden patient deterioration (FIRST2ACTWEB_) on student learning. *Nurse Educ Today* 35: e36–e42.
47. Foronda C, Alfes C, Dev P, Kleinheksef A, Nelson D, et al. (2017) Virtually nursing: Emerging technologies in nursing education. *Nurse Educ*. 42: 14-17.
48. Rudolph A, Vaughn J, Crego N, Hueckel R, Kuszajewski M, et al. (2017) Integrating telepresence robots into nursing simulation. *Nurse Educ*. 42: E1-E4.
49. Moule P, Goodman M (2013) Nursing research. An introduction, (2nd ed.). London: SAGE Publication Ltd.
50. Polit DF, Beck CT (2018) Essentials of nursing research. Appraising evidence for nursing practice, (9th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.
51. General Data Protection Regulation (GDPR) (2016).
52. Data Protection Act (1050/2018).
53. Glenn K, McKinney E (2015) Running Simulation for Large Groups is a Team Sport. *Clin Sim Nurs*11: 108-109.
54. Verkuyl M, Atack L, McCulloch T, Lui L, Betts L, et al. (2018) Comparison of debriefing methods following a virtual simulation: an experiment. *Clin Simul Nurs* 19: 1-7.
55. Reierson IA, Haukedal TA, Hedeman H, Bjork IT (2017) Structured debriefing: what difference does it make? *Nurs Educ Prac* 25: 104-110.
56. Smithson J, Belligan M, Glass B, Mills J (2015) Standardized patients in pharmacy education: An integrative literature review. *Curr Pharm Teach Learn* 7: 851-863.
57. Rutherford-Hemming T, Alfes CM, Breymer T (2019) A systematic review of the use of standardized patients as a simulation modality in nursing education. *Nurs Educ Perspect*. 40: 84-90.
58. Bentley S, McNamara S, Meguerdichian M, Walker K, Patterson M, et al. (2021) Debrief it all: a tool for inclusion of Safety-II. *Adv in Simul* 6: 1-6.
59. Verkuyl M, Hughes M, Atack L, McCulloch T, Lapum JL, et al. (2019) Comparison of self-debriefing alone or in combination with group debrief. *Clin Simul Nurs*. 37: 32-39.
60. Gantt LT, Overton SH, Avery J, Swanson M, Elhammoumi CV (2018) Comparison of debriefing methods and learning outcomes in human patient simulation. *Clin Sim Nurs* 17: 7-13.
61. Roussin C, Larraz E, Jamieson K, Maetre J (2018) Psychological safety, self-efficacy, and speaking up in interprofessional health care simulations. *Clin Sim Nurs* 17: 38-46.
62. Rudolph J, Reamer D, Simon R (2014) Establishing a Safe Container for Learning in Simulation. The Role of the Presimulation Briefing. *Simul Healthc* 9: 339-349.
63. Shinnick M, Woo M (2015) Learning style impact on knowledge gains in human patient simulation. *Nurse Educ Today* 35: 63-67.