Student-led Global Classroom (CLSGC) program on non-technical skills among undergraduate nursing students in three regions: A mixed-methods study

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Abstract

Background

Global nursing shortages and increasing cultural diversity in healthcare necessitate the development of culturally sensitive nurses. Intercultural learning and exchange programs have been shown to enhance nursing students' intercultural knowledge, cultural awareness, and sensitivity. However, non-technical skills such as communication, leadership, and teamwork are less emphasized in existing programs, despite their importance in facilitating adaptation to clinical contexts and ensuring patient safety across different ethnic groups.

Objective

This study aims to evaluate the effectiveness of a Collaborative Learning in a Student-led Global Classroom (CLSGC) program that employs video-based learning and student-led debriefings to enhance non-technical skills, and to explore the experiences of undergraduate nursing student participants from three different regions.

Methods

Seventy-eight nursing students from the Hong Kong Polytechnic University, Malmo University, and La Trobe University participated in the program. The program included three webinars on teamwork, communication skills, and leade

rship, facilitated through student-led discussions and video simulations. Data were collected using the Team Strategies and Tools to Enhance Performance and Patient Safety Teamwork Attitudes Questionnaire, and qualitative methods including focus groups and reflective journals. A paired *t*-test and manifest content analysis were used to analyze the quantitative and qualitative data, respectively.

Results

The quantitative results indicated significant improvements in the students' attitudes towards teamwork, communication, and leadership. The qualitative data shed light on the students' learning experiences, highlighting the value of cultural exchanges in exploring the importance of non-technical skills in practice, and the effectiveness of the program structure.

Conclusions

The CLSGC program effectively improved nursing students' non-technical skills and enriched their clinical practice. Integrating simulation-based learning and student-led debriefing sessions to enhance nursing students' knowledge and attitudes towards teamwork, communication, and leadership is recommended in nursing education. Continuous exposure to simulation should be part of nursing education to reinforce the significance of non-technical skills in practice.

Keywords

Cultural sensitivityIntercultural learningNursing educationNon-technical skillsStudent-led debriefingVideo-based simulation

1. Introduction

Global nursing shortages and increasingly culturally diverse communities require nurses to be more culturally sensitive. Intercultural learning in university may help to prepare nursing students from different ethnic and cult

ural backgrounds to learn from and with each other through the process of interaction (O'Brien et al., 2019). Intercultural learning is defined as the process of raising awareness of one's own cultural contexts and developing the capability to understand and interact sensitively with those from other cultures (Wong et al., 2017). Taking part in an exchange program is one of the most common ways for students to not only explore differences in cultural norms, healthcare structures, learning styles, and clinical practices in different places, but to also learn how to be receptive and nonjudgmental and to rethink conceptions of differences in nursing cultures (Markey et al., 2020). The evidence suggests that exchange programs have beneficial effects on nursing students' cultural self-efficacy (Long, 2014), intercultural knowledge (Gosse and Katic-Duffy, 2020), and cultural awareness and sensitivity (Leung et al., 2020).

Internationalization-at-home (IaH) programs have become an alternative way for students to engage with international peers without spending time abroad. IaH is defined as the utilization of telecommunication tools, such as Zoom or Skype, to promote international integration for students within a domestic learning environment (Guimarães et al., 2019). A recent study that investigated the use of an online platform for nursing students in two countries to share their experiences in promoting healthy lifestyles, demonstrated that the program enhanced their cultural awareness and sensitivity (Kor et al., 2022). Similar positive results, such as improving cultural knowledge and awareness of nursing global perspectives, were reported in a study that provided virtual collaborative meetings for students from different countries to discuss patient safety (Wihlborg et al., 2018). Another study involving students from 12 colleges also revealed advancements in the students' acknowledgment of diversity, and in their appreciation of intercultural dif

ferences after they had used the online exchange platform to share their insights on global health issues (Wu et al., 2021).

Previous studies exploring IaH program outcomes have emphasized procedural and technical nursing skills across different countries, such as infection control measures, aseptic techniques, and health assessment skills (Gosse and Katic-Duffy, 2020; Carlson et al., 2019). Non-technical skills, such as communication skills, leadership skills, and teamwork, have been mentioned less often (Chan and Nyback, 2015). In fact, equipping nursing students with non-technical skills is as important as having them learn technical skills. Developing non-technical skills enables students to be better prepared to adapt to the clinical context in different countries and can promote the safety of patients from different ethnic groups (Pereira et al., 2018). The findings from a study conducted by Boet et al. (2014) suggest that the non-technical skills acquired during undergraduate program were successfully transferred and applied in future clinical practice, ultimately leading to enhanced patient outcomes. Studies have found that nurses with better communication skills contribute positively to the treatment compliance, satisfaction, and quality of life of patients (Bello, 2017). Efficient communication among staff of different nationalities can also facilitate effective teamwork and foster clarity and continuity within a healthcare team, thereby reducing medical errors in hospital settings (Chan et al., 2017). Effective teamwork can enhance the job satisfaction of nurses by leading to less work stress and emotional burnout from cultural conflicts with colleagues from different countries (Rochon, 2014). Similarly, nurses with effective leadership skills can inspire and cohere with their colleagues from different cultural contexts to accomplish the common goal of delivering quality nursing care to individuals and the multicultural community (Douglas et al., 2014).

A recent review by Fukuta and Iitsuka (2018) revealed that non-technical skills are typically taught using strategies such as basic written case studies, role-playing exercises, or computer-based simulation with mannequins. The instructional content commonly covers communication skills (e.g., conveying and receiving information, active listening, empathy), situational awareness (gathering and understanding relevant information), teamwork (supporting team members, coordinating group activities, assessing roles and capabilities), and decision-making (assessing risks, selecting appropriate options, defining problems). These non-technical skills are recognized as crucial components in healthcare education to prepare students for the demands of clinical practice.

Video-based simulation learning has been recognized as one of the best methods of helping nursing students learn non-technical skills (Ho et al., 2023; Spence et al., 2020; Liaqat et al., 2021). Observing others perform the skills or actions via video can give students a visual anchor to connect their learning to real-life conditions and strengthen their confidence in learning particular skills (Wong et al., 2023). A study that employed a video-based simulation model to train nursing students to identify challenges in teamwork and communication in their practice found that nurses' performances in communication and teamwork skills improved significantly following the intervention (Cowie et al., 2014). Another recent study also demonstrated that by utilizing video-based simulation learning methods, nurses can visualize and recognize the consequences of ineffective teamwork and communication skills, hence increasing their awareness of the importance of these non-technical skills in practice (Weldon et al., 2019).

Following a video-based simulation, a student-led debriefing can help to consolidate what students have learned, by using the video as a role model and recalling their experiences and exchanging feedback with their peers (Christiansen et al., 2023). As a pioneering effort to further delineate student-centered learning, the aim in a student-led debriefing is to promote deeper learning in students through their active engagement and the use of collaboration and teamwork (Jaffrelot et al., 2024). Previous studies have found that peer learning helped students to interact beyond what was originally outlined in the case studies through intersubjectivity to reach a common ground (Carlson et al., 2019).

While the use of video-based simulation learning and student-led debriefings have been shown to be useful in improving the intercultural technical skills and knowledge of nursing students (Barton et al., 2018; Leung et al., 2021; Paige et al., 2021), to the best of our knowledge there has been no study that employed and combined these two pedagogies to enhance the intercultural non-technical skills of nursing students. Thus, the aim in the present study was to evaluate the effectiveness of a Collaborative Learning in a Student-led Global Classroom (CLSGC) program that employed video-based simulation learning and student-led debriefing models on communication, leadership, and teamwork skills, as applied to undergraduate nursing students in three different geographical regions. In this program, the students had the opportunity to utilize their previous clinical experiences and theoretical knowledge to engage in discussions in student-led debriefing sessions related to culture, teamwork, communication, and leadership in nursing, through the medium of video-based simulations and virtual collaborations. If proven successful, the program can afford new ways to deepen students' cultural understanding and global views of non-technical skills and clinical practice,

which may result in improvements to their cultural competency, prepare them to work in global health, and lead to improved patient safety.

2. Methods

2.1. Design and setting

The present study adopted a sequential mixed-methods research design. In a quasi-experimental approach, quantitative data were gathered through retest and posttest questionnaires, with qualitative data collected through follow-up focus group discussions (FGD) and reflective journals. The study took place within an established channel for collaboration for research and international exchange involving the School of Nursing at the Hong Kong Polytechnic University; the Department of Care Science at Malmo University; and the School of Nursing and Midwifery, La Trobe University, which have similar approaches for undergraduate nursing education, with comparable program structures, curricular content, and learning outcomes aimed at preparing students for professional nursing practice. This paper reports the outcomes of the program, using the Transparent Reporting of Evaluations with Nonrandomized Designs (TREND) checklist.

2.2. Participants

Participants were enrolled in the baccalaureate degree program to which the CLSGC program was appended to existing courses as an elective to enrich the intercultural aspects of nursing care. The study adopted convenience sampling, in which the research team screened and enrolled participants who were

readily accessible. Potential participants were included if they (1) were aged 20 and above and (2) had clinical practicum experience. They were excluded if they (1) were not enrolled in nursing courses, and (2) did not consent to participate. On online coursework sites and during the lectures, the research team introduced students to the program's purpose, procedures, and benefits. Eligible students who agreed to participate signed a written consent form.

2.3. CLSGC program

Seventy-eight students from the three universities participated. They were spilt into groups of eight (8). To enhance the cultural mix, the groups were deliberately arranged to include representatives from each university. During the program, students were required to utilize their previous clinical experiences and theoretical knowledge to engage in discussions related to culture, teamwork, communication, and leadership skills in nursing, through the medium of a virtual platform, Zoom Video Conferencing. Each webinar was guided by a set of learning outcomes developed by the research team to align with the underpinning baccalaureate curriculum.

Three 1-hour webinars addressed one of the topics of teamwork, communication, and leadership skills. Each webinar was peer-led and self-directed, and no teaching staff were present. A manual was developed by the research team to guide the students to achieve the expected learning outcomes. It also outlined the pre-briefing and debriefing processes for each group to support learning.

Each of the three webinars started with a pre-briefing session prerecorded by the teachers, followed by students watching one of the three simulation videos that mirror, anticipate, and amplify real teamwork, communication, and leadership situations from clinical practice. The simulation videos of different cultural contexts were created by the research team and validated by scholars from the three universities. After watching the simulation video, in the pre-divided cultural group the students were required to discuss the management of clinical situations in the scenarios, and the role and impact of the identified non-technical skills (whether leadership, teamwork, or communication skills) in the patient care situation. In a student-led debriefing session, students were guided by questions listed in the manual to facilitate the debriefing process and review important concepts such as mutual respect and collaboration to create a non-judgmental, safe, and trusting learning environment. This collaborative discussion was purposefully designed to cultivate teamwork, communication skills, and positive group dynamics among students. After the completion of each webinar, students were required to complete an entry in a reflective journal that addressed the student learning experience and discussed key learning points and outcomes. A guide was provided for each reflection.

2.4. Data collection

Before and after the program, students were invited to complete anonymous questionnaires, including a Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS) Teamwork Attitudes Questionnaire (T-TAQ) and background demographic questions. The T-TAQ is a 5-point Likert scale ran

ging from strongly disagree to strongly agree, which consists of 30-items aimed at evaluating the participants' attitudes towards teamwork, knowledge about effective team practices, and team skills in a clinical ward. Specifically, it measures five domains: *team structure, communication, leadership, situation monitoring, and mutual support*. The *team structure* domain measures the perceptions of students of characteristics or factors that may determine a high-performing team. The *communication* domain measures the views of students on the importance of communication skills in exchanging information among team members. The *leadership* domain measures the views of students on the importance of assigning, directing, and coordinating tasks, and facilitating optimal performance among the members of a team. The *situation monitoring* domain measures whether the students understand the team environment during different acute situations. The *mutual support* domain measures the students' views on the importance of anticipating the needs of other team members and of shifting the workload to achieve balance among the team members (Health Research and Educational Trust, 2015). Since situation monitoring involves measuring the real-time responses of students to changes in the status of patients and in the emotional status of the team members, it was not plausible to conduct such monitoring in an IaH program nor was it a focus of this study. Therefore, this domain was excluded from the final questionnaire. The total scores in each domain range from 6 to 30, with higher scores representing better perceived attitudes to skills in that particular domain. The domains of the scale were found to be reliable and valid, with the Cronbach's alpha ranging from 0.88 to 0.95, and construct validity ranging from 0.57 to 0.79, respectively (Agency for Healthcare Research and Quality, 2016). In addition to the scale, demographic data such as gender, age,

marital status, study year, and clinical experience were collected simultaneously.

Qualitative data were collected using FGD, facilitated online via Zoom video-conferencing and reflective journalling. The FGD investigated the students' experiences when participating in the CLSGC program, which was aimed at developing non-technical skills. An interview protocol with multiple open-ended questions guided the FGD. Following the receipt of consent, each interview session was audio-recorded and transcribed with additional note taking. Following completion of the program, students were invited to submit their reflective journals for a qualitative data analysis. The students' reflective journals were only accessed by the research team after receiving the written consent of each student.

2.5. Data analysis

SPSS version 26 was adopted to conduct a descriptive and inferential analysis. Background demographic data were presented in terms of mean and standard deviation for continuous variables, while median and quartile range were used for variables that were not normally distributed. A paired *t*-test was used to compare pre- and post-program differences in the four domains of the T-TAQ. The program was considered to be effective if the significance level was less than 0.05.

An analysis of the qualitative data was conducted using manifest content analysis according to the methods detailed by Kleinheksel et al. (2020). Mani

fest content analysis was used to describe the students' perceptions of their learning and their learning experience. Qualitative data were read by one author (KA) and coded using emergent codes, with the emergent codes then being grouped into categories. A secondary analysis conducted by a second author (MP) enabled the final categories and subcategories to be refined and defined. All of the codes, categories, and subcategories were revised for consistency, coherency and fit by all of the authors.

2.6. Ethical considerations

Ethical approval was obtained from the Human Subject Ethics Committee of the Hong Kong Polytechnic University before the commencement of the program (no: HSEARS20211015002-01). There were no risks or harms to the participants during the program. Signed written consent forms were stored in a password-protected cabinet while the data were secured in a password-encrypted database, to which only the members of the research team have access. In addition, no personal identifiers were revealed in the data; only code numbers were utilized. The participants were assured that they would not be subjected to any penalties if they did not participate in the program.

3. Results

3.1. Quantitative results

A total of 78 nursing students (12 male, 62 female) from these three universities completed both the pretest and posttest measures. Fig. 1 shows the CONSORT flow chart. Over 75 % of them were in year 2 or year 3 of their unde

rgraduate study. Although some students were older, most were in the range of 18 to 25 years (75.7 %), with a mean age of 24.45 (standard deviation [SD] = 7.33). Around 80 % of them had previous exposure in different departments (e.g., medical, surgical, or orthopedics) during their clinical placement.

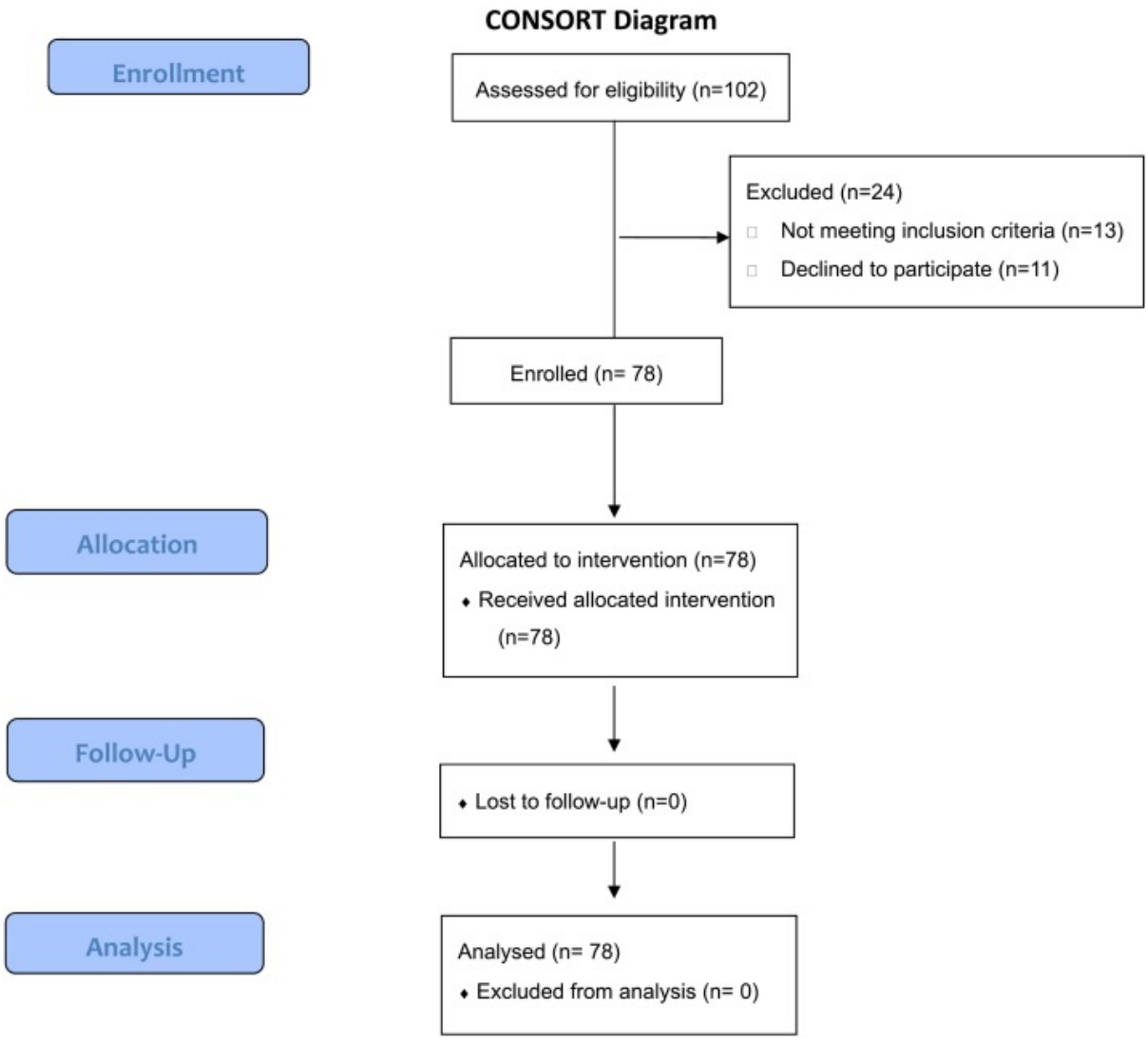

Fig. 1

Table 1 illustrates the participants' scores in the T-TAQ, which revealed significant positive changes in three of the four investigated categories of

the T-TAQ. The category of Team structure improved significantly by 0.449 points with a *p*-value of 0.018. The category of Leadership improved significantly by 0.397 points with a p-value of 0.032. The category of Communication improved significantly by 0.513 points with a p-value of 0.009. However, the category of Mutual Support did not obtain a statistically significant improvement from pre-intervention to post-intervention ($p = 0.16$). In addition, all of the respondents reported overall positive attitudes (ranging from 21.76 to 27.10 out of 30) towards teamwork both before and after the program training.

Table 1. Comparisons of pre- and post-program differences in the four domains of the TeamSTEPPS.

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Domains	**Mean different**	**SD**	**correlation**	**t**	**sig**	**Cohen's d**
Team structure	0.449	1.86	0.734	2.135	0.018*	1.856

Leadership	0.397	1.87	0.779	1.879	0.032*	1.868
Mutual support	0.269	2.39	0.826	0.993	0.162	2.394
Communication	0.513	1.88	0.703	2.412	0.009*	1.878

TeamSTEPPS = Team Strategies & Tools to Enhance Performance & Patient Safety.

*

p-value < 0.05

3.2. Qualitative results

A total of 30 students participated in the study - 10 from each of the three universities took part in the focus group discussions, and these same 30 students also consented to submit their reflective journals for analysis. The mean duration of the focus group discussion was 58 min. An analysis of the contents of the qualitative data revealed four main categories. Three categories aligned with the non-technical skills topic of the webinars and de

scribed the student's perspectives on learning outcomes, namely teamwork, communication, and leadership skills, each with subcategories (Table 2). The final category explored the learning experience of the students, with subcategories that included enriched nursing care, cultural healthcare, and recommendations. An analysis of the qualitative data is presented in Table 2 as a narrative with illustrative quotes.

Table 2. Categories, subcategories, and illustrative quotes.

Category	Subcategory	Illustrative quote
Teamwork	Team factors – elements of a team that contribute to the overall functioning and patient care outcome	"I learned that Hong Kong and Sweden have higher ratios of patients to nurses than Australia. According to a Hong Kong student, the nurses are so busy with their 10–12 patients that they do not have time communicate with each other. This is interesting, as I wonder how the nurses manage to care for their colleague's patients when the colleague is on break." Reflection 1.
		"Sweden and Hong Kong had the 'carer'/team nursing system, which allowed registered nurses to focus on the patient's medical needs, while the 'carers' focused on patient hygiene and assistance with ADLs (a

	ctivities of daily living).” Reflection 94.
Team hierarchy – a situation where the ranking of the team members according to status can influence functioning of the team	“We all agreed that the team with doctors and nurses worked well together, that one of the nurses got the role of nurse leader, and that all of the tasks were pointed out for both the patient and the rest of the team. The student from Hong Kong mentioned that they do not really work in the same way as a team, as they have a more structured hierarchy than we have in Sweden and in Melbourne.” Reflection 40.
	“…a key cultural difference relative to nursing teamwork. One of the students from Hong Kong identified the near-bravery and confidence that a student nurse would require if they were to question another health professional’s decision, both on placement and at work. It was suggested that students within Australian healthcare/educational settings may feel more comfortable raising their concerns or asking why a particular process or strategy was utilized during a patient’s care. We briefly discussed how this may result in curiosity being dismissed and how this emphasizes the gap bet

	ween students and health professionals.” Reflection 5
Team member autonomy - the ability of each team member to be self-governing that supports teamwork	“I think everyone shares an equal amount of responsibility. We have a greater amount of autonomy due to the general prescriptions - we don’t have to call anyone if there’s an emergency. We just get to do it and we save time by doing that, and it empowers the individual care provider.” Participant: - Filip (Sweden).
	“We also talked about teamwork with the doctors and what the nurses in the different countries were able/allowed to do without the doctor’s approval. In general, it was the same - you as a nurse need a prescription to give the drugs. But when we discussed it more it seems that we in Sweden have more of the ‘general prescriptions’ than in the two other countries. This means that the doctors and nurses more often h

	ave more close contact than maybe in Swede n.” Reflection 44
Patient as a member of the team	“We identified the similarity in communic ation among people of different cultural b ackgrounds; that is, it should be bidirect ional. Not only can nurses give instructio ns to patients, patients can also raise th eir own concerns regarding the instruction s and give feedback to the nurses. This tw o-way direction allows for shared decision making between the patient and healthcare workers, and thus enhances the quality of the care to be provided.” Reflection 16.
	“We learned that in Sweden, nurses usuall y do handovers or conduct discussions dire ctly in front of their patients, so that t heir patients clearly know what is happeni ng with them. By contrast, those from Aust ralia mentioned that they do not usually d iscuss the patients’ situation right in fr ont of the patients themselves because of problems of confidentiality. Some patients might not want other patients around them

	to know their condition. It is a matter of privacy.” Reflection 17.
	“In my opinion, the patients should be involved in their care, and then they have an opportunity to add to their handover, if we missed anything or they want to add anything.” FG – Participant Jack (Australia).
Imperfect reality of practice	“The similarity is that there is a huge difference between the nursing teamwork that we learned in school and reality. In school, we all learned how to communicate and collaborate with other nurses as a team and discussed the situation of the patients. However, in reality, nurses seldom communicate and discuss patient cases among themselves. The nurses often use orders instead of communication, since they expect that all of us know the rationale and reasons for their orders. However, we all think that this method is more efficient, since it can help the nurses to immediately understand their role and responsibilities, especially in emergency cases.” Reflection 12

		“The most important thing is to help to create a harmonious working climate to allow everyone to speak up, allow patients and any staff or junior nurses to ask questions.” Reflection 66.
Communication	Verbal communication strategies	“ISBAR was a universal tool used in both Australia, Hong Kong, and Sweden, and is a very useful framework to help with handovers. I found it to be great, as it helps with patient safety and gives nurses a systemic tool to go through systems effectively.” Reflection 7
		“Nurses mostly communicate during handovers and the communication is mainly one way. But in Sweden, nurses mostly communicate together, they share the responsibility together and promote two-way communication most of the time.” Reflection 23
		“When the nurses talked in the video and were reporting something, the other nurse was repeating what this nurse said to confirm that the information was right. I thou

	ght that this was very good.” Reflection 54
Written communication	“I spoke about Australia’s documentation system, and inquired whether the Electronic Medical Record system was used or where the paper-based system was primary. The responses were diverse….” Reflection 1.
	“We also discovered that the abbreviations for the medical terms used in each hospital are different. That could be confusing. The meaning could be misunderstood, which could impair communication. In order to promote communication, we have concluded that we should first search for the new words, ask the other nurses if we have missed the information, chat more, and spend more time caring for the patient.” Reflection 66

	Communication recipients	“… a conversation started regarding whether patients can view their own medical records, such as progress notes. Sweden allows patients to do this. I found this interesting as nurses would be under a lot of pressure to complete notes perfectly every time.” Reflection 1.
		“In Sweden it’s also part of the work material for the doctors and nurses, but it’s for the safety of the patients. They can go back to read what has happened to them and what the doctors and nurses have done. You, as a patient might, not be in the clearest mind to understand what’s happening and, afterwards, you want to know what happened, what medicines you got. If something goes wrong, you need to know why and who did it.” Participant – Kris (Sweden).
Leadership	Beneficial Leadership	“First, the first video … regarding transformational leadership, … prompted my critical thinking skills into action… a strong leader [needs] a strong work ethic, [needs to] work hard and emphasize a common mission…, aspects we as nurses we can facilitate. Other factors … are inspirational motivation, intellectual stimulation, and individual consideration; now I am more confident about how to show beneficial leadership.” Reflection 3
		“[It] was a scenario of a patient’s blood glucose level dropping, and the team neede

	d to work together to assist the patient. It was great to see the whole team working together, but there was one person I felt took on the leadership role; she was speaking in a kind but firm tone, recording the patient's vital signs, and keeping the rest of the team calm and focused on the task. Overall, from watching the first video then the second, I can now see how leadership is instigated properly in a healthcare environment." Reflection 3
Leadership exposure	"I feel that this could be an effective way of building nursing students' leadership skills through giving individuals the opportunity to step up when needed. Treating everyone equally could give students a chance to question things or offer suggestions that could make a real difference." Reflection 6
	"If you have done something in the leadership role before you have it in 'the bag', you can take something out when you need it. So, in my mind, it has to be exposure during university time…. In this case it's clinical practice, it's casework involving difficult cases, sometimes impossible cases. So, you have to think, like challenge yourself, because no one knows what t

	o do. You have to expose yourself to it.” Participant – Filip (Sweden).
Leadership role	“The simulation video depicted students following instructions and performing necessary tasks to keep a patient alive. This immediately showed me that nursing teamwork is evident through the delegation of roles in multiple cultural settings.” Reflection 5
	“It’s important that there is a clear leader, that you know who is the leader. You don’t get orders from different directions. We also talked about the importance of the leader being able to trust others.” Participant – Kris (Sweden).

	Factors influencing leadership	“Besides the simulation, we figured out the reasons and factors that affect leadership. For example, a knowledge deficit can have a negative impact on leadership. The nurses that are deficient in knowledge never have enough confidence to take over the responsibilities of the leader. It is a tough task for us to learn to be a leader.” Reflection 13
		“Following the simulation, I also raised the idea that students who speak up and ask questions may be showing leadership. Often without knowing, when a student asks a question, this can spark conversations that benefit other students and clear up any confusion.” Reflection 6
Learning experience	Enriched nursing care	“After 3 weeks of online webinars communicating with peers from Australia and Sweden, my global perspective about nursing care was enriched. It was a fruitful and unforgettable experience for me to meet nursing students from other cultures and different age groups, and I am so grateful to have taken part in this webinar.” Reflection 20

Cultural healthcare	“The biggest difference and the most interesting cultural difference to me personally was the dichotomy between Chinese traditional medicine and western medicine that the Hong Kong students pointed out existed within their clinical environment. Super interesting to learn about.” Reflection 35
	“The Swedish and Australian versions are similar, but the biggest difference was the Hong Kong students, because they have to integrate both Chinese medicine [and western medicine]…. There is a different system of hierarchy so there’s a different cultural phenomenon in Hong Kong.” Participant – Filip (Sweden)
Recommendations	Icebreakers before people get to know each other. “You are forced to engage in conversation and thoughts to break down the initial barrier between people.” Participant – Filip (Sweden).
	Better representation from all universities. “Bigger groups, because we should have had more people in our group.... It was nice to have people from different countries because the majority were from Sweden, … two or three from Hong Kong, and one from Australia. Maybe this made people more nervous about talking, but there will always

be people who won't be there." Participant - Kris (Sweden)

In the teamwork category, the following five subcategories were recognized: team factors, team hierarchy, team member autonomy, the patient as a member of the team, and the imperfect reality of practice. In the team factors subcategory, students described how the various elements of a team can influence overall team functioning. Examples include different nurse-to-patient ratios, which limited the amount of time that nurses had to communicate with each other, and the different range of practices that enabled some nurses to focus on medical needs.

Students reported that ranking team members according to status can influence the way that a team functions. The ability of nurses and doctors to work together and collaborate in patient care was noted in Sweden and Australia. However, it was suggested that the structured hierarchy present in Hong Kong influences team dynamics. This hierarchy was shown to affect the ability of students to raise questions and concerns, and it was suggested that it also discourages expressions of curiosity. It was highlighted that the collaborative teamwork in Australia and Sweden may make it easier for team members to raise concerns or question decisions.

It was emphasized that the ability of team members to be able to make autonomous decisions empowers individual care providers and distributes responsibility across the healthcare team. However, concerns were raised that this might also have the effect of limiting the number of interactions between members of the healthcare team, which could affect collaborative patient care.

The importance of working with patients and including patients as members of the team was highlighted. It was suggested that promoting shared decision-making with patients can enhance the quality of the care that is provided. However, there were differences in perceptions of value and confidentiality in nurses handing over responsibilities in front of patients. Some students valued the ability of nurses to engage with patients and empower them to add anything to the discussion that was missed. Others were concerned about patient privacy and confidentiality.

In the category of the imperfect reality of practice, students reported that what was discussed in the program was vastly different to what was implemented in practice. Students lamented that the limited communication that occurred in practice influenced teamwork and stated that greater communication would help nurses to understand their role and responsibilities. Moreover, implementing these practices would "create a harmonious working climate to allow everyone to speak up, [and] allow patients and any staff or junior nurses to ask questions" (Reflection 66).

In the communication category, three subcategories were recognized, namely, verbal communication strategies, written communication, and communication recipients. Students discussed the common communication strategies used in healthcare systems across each country that supported quality patient care. Strategies such as ISBAR, two-way communication, and closing the loop were highlighted. These strategies were recognized as enabling the sharing of responsibilities and promoting patient safety.

In the written communication subcategory, the diverse approaches used in each country were noted. The challenges in written communication were noted, with each hospital using different abbreviations, which meant that instructions could be confused and meanings misunderstood, which would impair communication. To manage this issue, it was suggested that a conversation about new words and abbreviations would clarify meanings and address any missed information.

It was reported that it is important to know who should have access to written communication regarding the patient. Students noted that, traditionally, the written record is part of the working material that nurses and docto

rs draw upon to support patient care. However, in Sweden it was remarked th at patients can have access to and read such notes. It was suggested that t his supports and promotes patient safety.

In the leadership category four subcategories were noted, namely, beneficia l leadership, leadership exposure, leadership role, and factors influencing leadership. A student commented on how the resources in the program prompte d them to think about what skills an effective leader needs and that, after considering these, they were more confident about their ability to demonstr ate beneficial leadership. It was observed that it was possible to influenc e the care of a patient through leadership by working to keep the team focu sed on the task.

Another student reported that the way to build leadership skills was to exp ose students to episodes of effective leadership to enable them to step up when needed. The idea is that if you have prior experience of leadership, t hen you may be able to more readily recall the skill and knowledge required to implement leadership skills such as raising questions and offering alter native suggestions.

Students were able to recognize the key features of the leadership role tha t were needed to support the delivery of safe and quality patient care. The ability of a leader to be seen and recognized, give clear orders, delegate care, monitor patient care tasks, and engender trust in team members was no ted.

However, students also recognized the elements that could influence leaders hip, such as a knowledge deficit, which may reduce an individual's confiden ce in their ability to take on the responsibilities of being a leader, and the additional burden of accountability. Moreover, students mentioned that when someone in practice asks questions and speaks up, that is an example o f performing elements of leadership, as doing so can spark conversations, c lear up confusion, and support safe patient care.

The final category explored the student learning experience in the program and outlined how the three-week learning experience led the students to dev elop a global perspective of nursing and enriched their nursing care. Some

students highlighted how the experience accentuated similarities in nursing practice, but also showed them how cultural practices can influence healthcare around the world. Some recommendations were also made to improve the learning experience, including the use of more icebreaking activities and smaller groups to support student-to-student interactions with better representation from different university groups. Suggestions were also raised on other topics for future webinars, such as about the scope of practice and ethics and laws across the different regions of the globe.

4. Discussion

The present study evaluated the effectiveness of the CLSGC program, which employed video-based simulation learning and student-led debriefing models on communication, leadership, and teamwork skills. Also explored were the learning experiences of undergraduate nursing students in three geographical regions who were enrolled in the program. Delivering a practical, online non-technical skills training program allowed students from three different countries to interact in a virtual environment, which enabled them to explore issues of communications across teams and hierarchies in a meaningful way. It also made it possible for them explore roles of responsibility within teams, which is important to facilitate patient safety. These findings may ultimately contribute to the development of effective educational experiences that help students to transfer the non-technical skills that they have learned into behavior and practice.

There is growing evidence that non-technical skills are essential for nurses to practice competently. Therefore, non-technical skills should be incorporated into nurse education at all levels (Wevling et al., 2023), so that training in such skills takes place as early as possible in the course. The emphasis on the importance of early implementation is based on the knowledge that non-technical skills are not acquired through clinical practice; rather, nurse academics across various institutions have adapted a simulation-based curriculum for the cultivation of such skills (Koukourikos et al., 2021). Several studies in medical and nursing education have confirmed the po

sitive impact of simulation in comparison to traditional lectures on students' learning and acquisition of knowledge relating to non-technical skills (Moll-Khosrawi et al., 2021). Moreover, the development of non-technical skills through the use of virtual simulation has also been previously established, with positive outcomes on the knowledge, skills, and professional practice of students (Peddle et al., 2019). A study conducted by Spence et al. (2020) concluded that simulation should be a continuing exercise to expose healthcare professionals to the importance of non-technical skills in leadership, teamwork, and communication. Our results confirm these previous findings. Significant improvements were seen in the students' knowledge and attitudes about teamwork, communication, and leadership after using video-based simulations in a virtual program.

As with the findings of Peddle et al. (2019), although the students in our study did not have direct "hands-on" involvement in the simulation scenario, the online video-based simulation learning and student-led debriefing had a positive influence on the students' knowledge and provided them with an opportunity to reflect on communication, teamwork, and leadership skills. The authors report that holding a debriefing is a crucial component to promoting the actual process of learning following a simulation (Coggins et al., 2017). In our study the debriefing component of the simulation activity was led by students, guided by a debriefing manual. Student-led debriefings can support reflective thinking; however, the key to achieving depth in the reflective thinking is the trigger question that is posed (MacKenna et al., 2021). In our study, the questions in the manual that were used to guide student debriefings were informed by best practice standards, relevant literature, and per reviews conducted by the research team. These were used to guide thoughts about the practices depicted in the video. According to MacKen

na et al. (2021) students respond well to questions that require descriptions of practice, which provide the foundation for reflections on practice.

Focus group discussions and reflective journals from participants from a diversity of cultures provided insightful perspectives on what they had learned through participating in the video-based simulation and discussions held through debriefings. Students highlighted various aspects of teamwork, communication, and leadership that were demonstrated in the video simulation and discussed how each non-technical skill resonated or conflicted with their own clinical practice. The participants in this study said that the opportunity afforded in the simulation and debriefing enriched their own clinical practice. Similar findings have been reported in the literature, suggesting that when students reflect on their own performance through simulation this can enrich their clinical practice (Frederick and Gelderen, 2021) and improve their professional practice (Malik et al., 2023). Most importantly, in the debriefing sessions students were able to identify the best practices that should be adopted regarding non-technical skills. Uniquely, in our CLGSC, students from different cultures identified similarities and differences in the practice of non-technical skills and acknowledged the variations in the context of cultural differences in various countries. Moreover, students highlighted the discrepancies between what they had learned in their coursework on campus about non-technical skills and their experience in the clinical setting. Students discussed the “huge difference in reality” in the clinical setting, which was categorized in this study as the imperfect reality of practice. Previous research has indicated that giving students opportunities to explore the reality of practice in simulation can help students to translate the learning of non-technical skills into practice (Peddle, 2019).

In the focus group discussions, students appreciated the structure of the program, namely, a pre-briefing, a video-based simulation, followed by a student-led debriefing. During the one-hour webinar, students took the opportunity to lead the webinar and debriefing. They had control over the speed and direction of their learning during that hour. Prior research on student-led learning suggests that giving students control over and opportunities to practice leading webinars increases their confidence and supports self-improvement (Malik et al., 2023). Second, the guided questions listed in the webinar manual helped the students to connect with their prior experiences, while learning new communication, teamwork, and leadership skills. As discussed above, the student-led debriefing, while fostering the reflective process and promoting deeper learning, also facilitated the development of global perspectives on nursing care. In this study, students reflected on the cultural aspects of healthcare and how this can influence practice from a patient safety perspective. These findings are similar to those reported in Malik et al. (2023), who showed that students developed cultural awareness and realized the importance of taking culture into consideration in patient safety practices.

5. Strengths and limitations

The strengths of this research lie in the alignment of the research design (a sequential mixed-methods approach), to the research aim, to gain a broader and deeper understanding of the phenomenon under investigation. Additionally, the methods of collecting and analyzing data that were used in the study aligned with the research design. The qualitative data gathered in the research enabled the qualitative results to be explored and explained. The research findings were gathered from three distinct geographical sites and institutions, and support consideration of findings in other settings. Furthermore, the research team is adept at conducting mixed-methods studies and has a strong understanding of quantitative and qualitative methods. Multipl

e authors were involved in analyzing the data. All of the authors considered the findings and ensured that they were coherent and consistent. The use of a valid and reliable tool such as the T-TAQ supported the production of accurate, consistent, and useful results. Moreover, the FGD were guided by an interview guide supporting a standard group of questions.

Only students who participated in the CLSGC program were invited to participate in the study. It cannot be claimed that the self-selected convenience sample is representative of the population as a whole. The study used self-reported questionnaires to measure outcomes, which may have affected the findings.

6. Conclusions

The present study evaluated the effectiveness of the CLSGC program, which employed video-based simulation learning and student-led debriefing models to develop nursing students' communication, leadership, and teamwork skills. The results showed that the students had positive experiences and demonstrated improvement in their non-technical skills through participation in the CLSGC program. The results of this study provide several valuable insights that could inform future directions for nursing education. First, it may be beneficial to further integrate simulation-based learning into the curriculum to enhance students' knowledge, attitudes, and skills related to teamwork, communication, and leadership - as demonstrated by the effectiveness of the CLSGC program. Additionally, it is recommended that training in non-technical skills be incorporated at an earlier stage of the nursing program, as these fundamental competencies are not solely acquired through clinical experience but should be developed proactively. Prioritizing structured debriefing sessions within simulation-based learning activities could also promote deeper reflection and understanding of the concepts underlying non-technical skills among students. Furthermore, deliberately encouraging discussions on cultural differences in the practice of non-technical skills could foster greater cultural awareness and sensitivity among nursing students, preparing them to work effectively in diverse healthcare settings. Lastly, integrating simulations as a continuous learning tool throughout the students' education and professional development may help to reinforce the significance of non-technical skills and support their integration into students' behavior and practice as future healthcare professionals. Overall, these rec

ommendations aim to enhance the development of non-technical skills among nursing students and equip them to be competent, culturally sensitive practitioners in diverse healthcare environments.

CRediT authorship contribution statement

Arkers Kwan Ching Wong: Writing – review & editing, Writing – original draft, Project administration, Methodology, Formal analysis, Conceptualization. Engle Angela Chan: Supervision, Project administration, Methodology, Investigation, Conceptualization. Kadence Shuk Yu Chan: Writing – original draft, Investigation. Jacqueline Johnston: Writing – review & editing, Project administration, Methodology, Formal analysis. Gulzar Malik: Writing – original draft, Supervision, Methodology, Investigation, Conceptualization. Monica Peddle: Writing – review & editing, Supervision, Methodology, Conceptualization. Katherine Frodsham Webster: Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Conceptualization.

Declaration of competing interest

The authors declare that they have no conflicts of interest.

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