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Use of a Standardized Tracheostomy Patient Simulation to Evaluate Student Clinical Communication Skills

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Use of a Standardized Tracheostomy Patient Simulation to Evaluate Student Clinical Communication Skills

Abstract

Simulation is a valid pedagogical tool used to teach students, observe student clinical skills, and to assess clinical competencies. During the COVID-19 pandemic, a lack of medical speech-language pathology placements required graduate programs to re-examine clinical training. Simulation has proven useful in providing an alternative and safe learning modality. Standardized patients, which are one simulation modality, provide increased standardization and higher fidelity than medical manikins. This is particularly true in the context of both student learning and demonstration of clinical communication skills (CCS) within a simulated learning environment where the simulated patient can interact authentically with the student clinician. CCS are important because they can lead to better treatment outcomes and strengthen the therapeutic alliance. The purpose of this study was to evaluate the evidence for a CCS training in the context of a speaking valve trial with a standardized tracheostomy patient. Results showed that students are demonstrating emerging skills or have already developed CCS in this context. Student questionnaire ratings suggest that this simulation was helpful to their learning as it provided a safe environment for them to practice valuable clinical skills. Simulation appears to be a viable modality to use when training CSD students to improve their CCS.

Keywords

Simulation, Standardized Patients, Clinical Communication Skills, Speaking Valve Trial, Tracheostomy

Authors

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Simulation in CSD

Communication sciences and disorders (CSD) graduate programs are tasked with providing their students with high quality clinical education. It is the responsibility of CSD graduate clinical programs to establish relationships with clinical sites serving diverse populations, to ensure that clinical supervisors have met requirements (i.e., 2 hours of supervision-related professional development and have held CCCs for 9 months full-time) outlined by the American Speech-Language-Hearing Association (ASHA). Furthermore, programs must also assess clinical competencies for each student, support student development of entry-level clinical skills across the depth and breadth of the professional scope of practice, and ensure the welfare of each person served by student clinicians (Council on Academic Accreditation in Audiology and Speech-Language Pathology, 2020). As the scope of practice for speech-language pathology expands and expectations of student competency upon graduation increase, CSD programs must be able to adapt flexibly and swiftly to provide effective classroom and clinical education.

One pedagogical tool that is becoming more common in CSD is the use of simulation to support clinical education (Dudding & Nottingham, 2018; Hewat et al., 2020; Penman et al., 2021, Stead et al., 2020). A national survey of simulation implementation in CSD programs revealed burgeoning interest in simulation with computer-based simulations among the most frequently implemented simulation approaches (Dudding & Nottingham, 2018). Simulations can help increase standardization, equity, consistency of student skill development, and provide a safe learning environment for student clinical training (Quail et al., 2016). Clinical simulations, in a variety of forms (e.g., computer-based simulation, simulated and standardized patients, and part-task trainers) offer a viable educational tool to allow CSD students to acquire professional competencies and skills (Macbean et al., 2013). Additionally, research has shown that SLP students value the learning and experience that simulation provides (Hewat et al., 2020). Quality simulation design allows for active practice with immediate feedback and reflection and well-designed simulations shift a large proportion of the learning accountability to the student. To achieve this learning, simulation implementation should include components of pre-briefing and debriefing (Dudding et al., 2019; International Nursing Association for Clinical Simulation and Learning, 2021). Dudding (2020) argues that the integration of simulations throughout a curriculum could advance the way CSD programs assess student skills in both formative and summative ways.

Standardized Patients. Within simulation pedagogy, standardized patients (SPs) are one modality that often provide the highest fidelity. This form of simulation utilizes a person simulating a patient in a standardized, repeatable way (Dudding & Nottingham, 2018). Zraick (2020) concluded that use of SPs in clinical training has potential to complement existing educational methods and to assist in evaluation of clinical competencies. Research has shown that one large advantage of using SPs in simulation is their ability to provide students with the patient's perspective (Clynes & Raftery, 2008; Qureshi & Zehra, 2020). To date, the CSD literature has documented that faculty and students value the incorporation of SPs into their clinical program and acknowledge the benefit of this modality for learning a variety of clinical skills (Zraick et al., 2003). It is expected with time and experience simulated learning opportunities, including the use of SPs, will become increasingly realistic, resulting in improvements in student learning outcomes and increased clinical competency.

Additional benefits to simulation and use of SPs are increased student confidence and reduced anxiety in student clinicians' ratings of their performance (Penman et al., 2021). Hill and colleagues (2014) found that both undergraduate and graduate speech-language pathology students reported decreased anxiety and increased confidence after working with standardized patients to further their clinical learning. This suggests that use of simulation may be an effective way to bridge the gap between academic courses and clinical experiences, allowing students to practice clinical skills learned in the classroom in a low-stakes environment. Furthermore, this low-stakes practice can build student self-efficacy by supporting the development of task fluency through clinical educator feedback prior to working with clients in a medical setting. Students are able to make mistakes without harming a patient and learn from these errors.

Simulation and Medical SLP Placements. Students can learn more about medical speech-language pathology (SLP) with simulation (Stead et al., 2020). Clinical placements in medical SLP have been difficult to obtain, so simulations are particularly helpful. Even when healthcare-based clinical experiences are available, the number of students assigned to these experiences was still limited to a fraction of each cohort of students. Despite the lack of specific medical placement data, evidence suggests that clinical placements are difficult to obtain in general for CSD programs. According to the 2021 CSD Education Survey, 39.5% of programs reported moderate or major impacts due to a lack of clinical placements (Council of Academic Programs in Communication Sciences and Disorders & American Speech-Language-Hearing Association, 2022). When considering the limitations of traditional clinical placements, whether due to limited availability or high-risk patient populations, simulation is a viable option to supplement student learning (Hewat et al., 2020; Quail et al., 2016).

The COVID-19 global pandemic has overwhelmed the United States healthcare system across multiple waves of the SARS COV-2 virus, reducing opportunities for student placements in medical settings. Hospital policies have restricted entry to solely "essential" personnel for patient and public safety further limiting placements in medical settings. Use of simulation-based learning with a focus on low-frequency and high-risk diagnoses (e.g., speaking valve trials, tracheostomy care) allows an opportunity for all students within a cohort to practice and receive feedback on developing these clinical skills, even in the absence of a medically-based clinical placement (Quail et al., 2016). Therefore, addition of simulation-based learning may be beneficial to all students, ensuring that they will gain experience, even if brief, with the development of medical SLP clinical knowledge and skills.

Tracheostomy Management Simulations. Specific to medical SLP clinical skills training, Miles and colleagues (2019) found that simulation is an effective way to train SLPs where it may not be practical or feasible to obtain sufficient hands-on training in working with low-frequency, high-risk populations (e.g., tracheostomy management). Following a tracheostomy care simulation, researchers also found that communication was better and SLPs felt more comfortable with interprofessional interaction related to tracheostomy management following participation in a simulation experience. Ward and colleagues (2014) also investigated whether or not simulation can be used validly to train practicing SLPs to provide competent tracheostomy management. Participants attended a simulation training consisting of an orientation, part-task trainer (e.g., cuff deflation and reinflation), and immersive scenarios utilizing a simulated patient. Baseline

knowledge of tracheostomy care had been collected prior to the workshop in the form of a multiple-choice online quiz. Participants from the study were rated as performing all tasks successfully with their simulated patient. Questionnaire data revealed that SLPs indicated that simulation training is a valuable tool that should be used to assist clinical training in tracheostomy management both immediately and 4-months after completion of the simulation (Ward et al., 2014).

Clinical Communication Skills Training. Clinical communication skills (CCS) are important for students to learn and practice as it has been shown that successful CCS can lead to better patient outcomes, improved patient adherence to treatment recommendations, and increased patient satisfaction related to their medical encounter (Brown, 2010). Interestingly, Brown (2010) also discussed literature that suggested that medical students without training in CCS believed that CCS were intrinsic and did not believe that they could be trained. CCS training may be addressed in courses at the graduate level, such as counseling, but might not be required or present in all CSD programs (Watermeyer & Kanji, 2022). However, it was noted that students with training in CCS reported feeling more aware of the complex nature of communication and were better able to understand their patients' needs (Willis et al., 2003). This information suggests the importance of explicitly training CCS to students who will be going into a patient-care setting, such as SLPs. Simulation provides one such method for explicitly training these skills in a high-fidelity setting with a standardized patient, who can respond to the student clinician in real time, while being observed by a clinical educator who can provide relevant feedback. One crucial aspect of delivering clinically competent care in tracheostomy and airway management specific to SLPs is utilization of skilled communication throughout the patient encounter. SLPs are tasked with explaining the procedural steps of the process of placing a speaking valve, all while maintaining an empathetic and supportive mode of communication during a potentially fear-inducing and uncomfortable experience for the patient.

One way to explicitly train CCS and allow students to practice newly learned skills is through simulation and use of standardized patients (Baylor et al., 2019; Tharpe & Rokuson, 2010; Towson et al., 2018; Zraick et al., 2003). A benefit to teaching CCS through simulation is that standardized patients, who respond authentically to student CCS attempts and provide feedback to students, can be used. In addition to the feedback provided by a clinical educator, feedback from the simulated patient can be especially valuable, as it gives the patient perspective to help students improve their CCS (Clynes,& Raftery, 2008; Qureshi & Zehra, 2020).

There is currently limited research in CSD related to training CCS with CSD students (Zraick et al., 2003; Tai et al., 2018; Towson et al., 2018; Watermeyer & Kanji, 2022). However, the literature in related health professions suggests that direct training of CCS can help to improve the patient-provider relationship, improve patient satisfaction, and increase student awareness of their own communication style and their belief that they can change and/or improve their communication (De Villiers & Van Heusden, 2007; Salgado & Castro Vale, 2020; Willis et al., 2003). Based on the integration of the literature surrounding healthcare simulation, simulation practices in CSD, and the combined need for student training in medical settings and explicit practice with CCS, a simulation experience was designed.

Purpose of Study

Faculty within the graduate SLP program at Pacific University chose to embed simulation into a second-year graduate course in voice disorders. A simulated learning experience was designed for students to practice CCS in the context of a speaking valve trial, utilizing a SP with a wearable tracheostomy chest overlay simulator. This experience was specifically and uniquely designed to focus on the formative evaluation of CCS in a simulated medical environment, in addition to providing hands on-experience with the procedural details of placing a speaking valve.

The purpose of this study was twofold: (a) to examine student performance within a clinical communication simulation in the context of a speaking valve trial with a standardized tracheostomy patient and (b) to examine student evaluation of the simulation. Driving questions for this study included:

1. What was the level of student performance within the simulation when rated by supervising educators and the SP on CCS rubrics?
2. Did the SP and supervising educators rate students' performance differently on CCS rubrics?
3. What was the students' overall evaluation of success of the simulation with respect to their mastery of content and skills?
4. Was there a relation between students' overall evaluation of the simulation and their performance as rated by the SP and supervising educators on CCS rubrics?

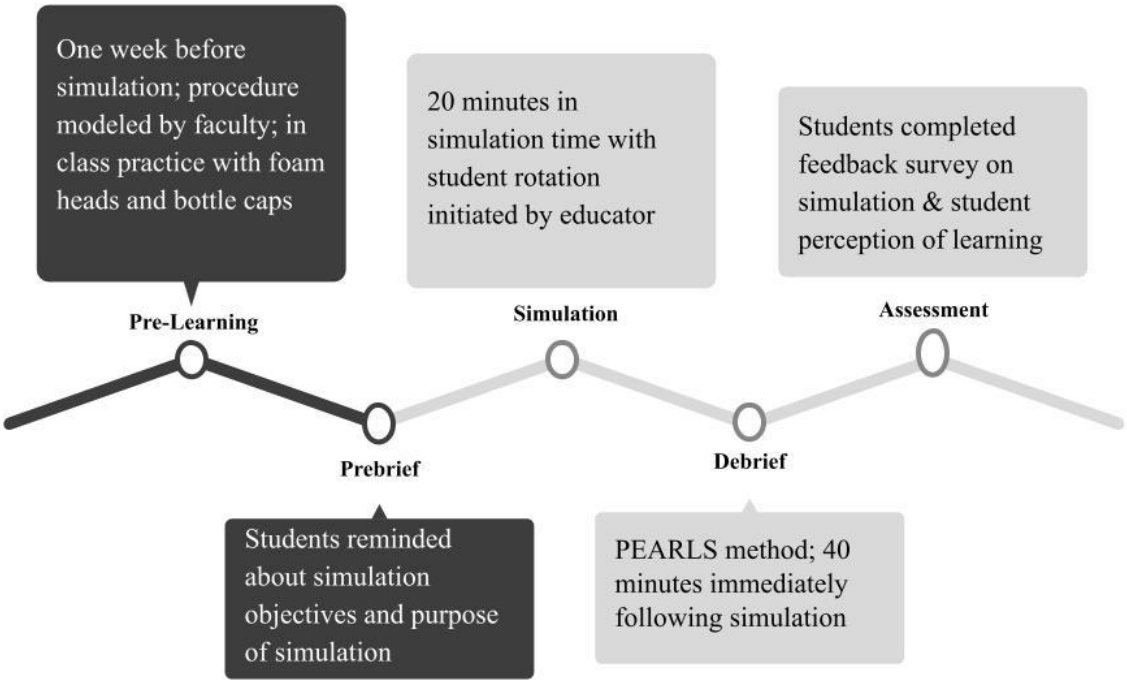
Methods

Simulation Design. The design of this simulated experience was based on the International Nursing Association for Clinical Simulation and Learning's standards (International Nursing Association for Clinical Simulation and Learning, 2021), which promote high-fidelity and rigorous training methods in simulation. Each component of the simulation (i.e., prebrief, simulated patient, debrief method, and student questionnaires) was selected intentionally based on these standards with the guidance of a Certified Healthcare Simulation Educator (CHSE) to ensure a foundation in evidence-based simulation work. See Figure 1 for a visual representation of the simulation design.

Supervising educators were trained in simulation pedagogy (e.g., prebrief procedures, evaluation methodology, debrief facilitation) by the simulation program coordinator. The SP utilized in this simulation was a professional actor recruited from a local theater company. Two weeks prior to the simulation, the SP was provided with written case descriptions, a detailed script, and videos of tracheostomy patients during speaking valve placements. The script (see Table 1 for example or Appendix A for the full-length version of the script) was created to provide possible student responses and prepared SP responses whenever possible to maintain standardization across student groups. One week prior to simulation, the SP met with the simulation coordinator via Zoom to review the simulation format, practice the simulation script, receive feedback on performance, and review the assessment form the SP would use to evaluate students. Two days before the simulation, the SP came to the simulation space for a dress rehearsal in which the simulation coordinator and both supervising educators were present. The simulation was run in its entirety multiple times to increase standardization and ensure fidelity of SP performance.

Figure 1

Visual Map of Simulation Flow



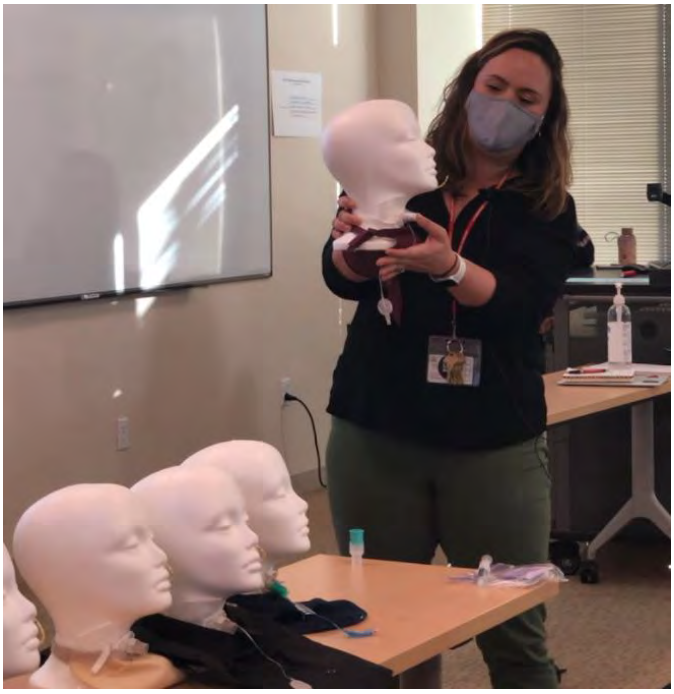
Participants. Thirty-three second-year students in the graduate SLP program participated in the simulation at the end of their 4th semester. As part of their typical learning assessment within their Voice Disorders course, all students participated in a formative simulation related to clinical communication in the context of a voice valve trial on a tracheostomy patient.

Following approval from the Pacific University Institutional Review Board, student assessments and outcomes were analyzed to examine simulation outcomes. Approval was granted to use both SP rubrics, supervising educator rubrics, and student questionnaire responses in order to evaluate the outcomes of the simulation.

Pre-Learning. Before the simulation students were provided a variety of pre-learning materials for preparation. Students were currently enrolled in a three-credit Voice Disorders course, and all learning materials and simulation preparation took place within that course. Previously, all students had completed a one-credit counseling course and a two-credit medical SLP seminar. One week before the simulation, students were provided the following objectives associated with the simulation: a) communicate clearly with patient to set expectations regarding sensory and emotional experiences throughout the encounter; b) inform patient of the discrete steps of the procedure using patient friendly language; c) use counseling techniques to manage patient emotions throughout the encounter; and d) demonstrate clinical/critical thinking skills throughout the encounter.

Figure 2

Pre-Learning Demonstration of Speaking Valve Procedure Using Styrofoam Models



During the pre-learning training session, students were also provided with the discrete steps for a speaking valve trial with a tracheostomy patient. (See Appendix A for the full script provided to the SP; students only received columns one and two for their discrete step practice.) Within this training class period, students also observed a supervising educator model both the procedure from beginning to end and the CCS necessary for the procedure. In addition, the students were provided with the opportunity to practice the procedure using Styrofoam mannequin heads fitted with tracheostomy tubes. These materials were made available to the students until the day of the simulation for practice prior to the simulation.

Video examples of tracheostomy patients undergoing speaking valve placement trials were provided to students during pre-learning. Students were encouraged to practice their CCS in the context of the speaking valve placement, as the procedure of the valve placement itself would not be evaluated. The following simulation case study and background details were then provided to the students.

- Case Study: The patient is a 70-year-old male admitted to a long-term acute care hospital with a diagnosis of respiratory failure secondary to severe sepsis related to urinary tract infection (UTI), left lower leg wound infection, and right lower lobe pneumonia (RLL PNA). Patient requires tracheostomy support.
    - Tracheostomy Tube: Shiley, size 6, cuffed
    - Swallow Status: NPO, all nutrition via gastrostomy tube
    - Secretion Status: Scant oral and tracheal secretions, frequent but productive cough, no suctioning currently required

- Background: As a standing order at the treating facility, all patients with tracheostomies are screened on admission. This patient was identified as a candidate for evaluation by SLP for a speaking valve assessment. The respiratory care practitioner and SLP collaborated to initiate speaking valve assessment and placement.

Prebrief. On the day of the simulation, students arrived at the designated location and were led through a 5–10-minute pre-brief with their supervising educator. This prebrief was scripted for the educators to maintain standardization (see Figure 3). At this time, students were also provided with an audio and video release form and a fiction contract. The purpose of the fiction contract was to remind students to enter "into the spirit of the simulation," and that interactions within the simulation are considered confidential and are not to be shared outside of the simulation or debrief.

Figure 3

Prebrief Script for PMV Simulation

"Welcome Everyone! The purpose of Simulation is to give you an opportunity to demonstrate your ability to communicate patient friendly information, manage patient expectations and emotions, and use clinical thinking in the context of a medical patient encounter"

"This is a confidential and Safe Learning Environment. We are using the simulation as a form of formative assessment not summative assessment which means you will not receive a grade for this activity but will use the experience and feedback to further develop your clinical skills and develop your clinical competencies"

"In this simulation you will be working with a standardized patient playing the part of a tracheostomy patient ready for a PMV trial."

"We as instructors will do all we can to make the simulation as real as possible. Simulation fosters active engagement in a safe learning environment. Your role is to "enter into the spirit" of the simulation, engaging with the "professional," "patient," or "family." This will provide you with the best active learning opportunity possible. Remember confidentiality: What happens in simulation stays in simulation. You should come to simulation with a non-judgmental attitude and be open to learning from your patients, peers and faculty."

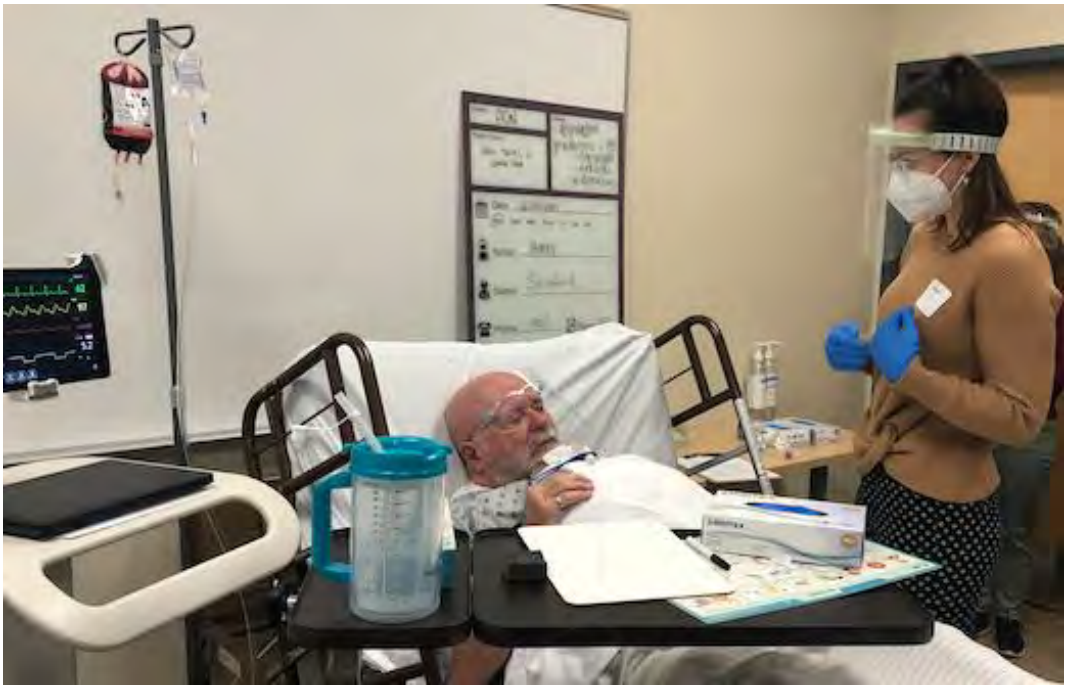
"Following the simulation you will enter a 30 minute debrief to discuss the simulation and your learning with your education supervisor. What questions do you have before we begin the simulation?"

- Hand out Fiction contract and have students sign
- Video/Audio release

"As a reminder this simulation is focusing on your clinical communication skills in the context of a PMV trial. When you walk into the room the patient will be in their bed. The moment you open the door, the simulation begins. __(name student)__ will take the initial lead".

Figure 4

Standardized Tracheostomy Patient and Student Interaction in Simulation



Simulation. Following the pre-brief, the students entered a small simulation space designed to look like a hospital room, to begin the 20-minute simulation (see Figure 4). The SP was resting in the hospital bed. During the simulation, the supervising educator notified students when they should rotate and let the next student continue the procedure within a group of three students. The supervising educator used a rubric to evaluate each student's CCS within simulation. Following the simulation, the SP also evaluated each student's clinical communication using a rubric (Appendix B for all Simulation Rubrics).

Debrief. Immediately following the simulation student groups completed a forty-minute debrief with their supervising educator. The Promoting Excellence and Reflective Learning in Simulation (PEARLS) approach was utilized to provide students with a structured opportunity to reflect on both their emotions regarding the simulation and their clinical performance as it related to the stated objectives. See Table 2 for the full script utilized for the debrief within the PEARLS structure.

Table 1

Examples of Specific Procedural Steps within the Simulation

Step # of Procedure	Anticipated Student Actions	Standardized Patient Actions
Step 3: Verify and record baseline vital signs	● Monitor starting patient vitals: ○ Respiratory rate (work of breathing) ○ Heart rate ○ O2 saturations ○ Note productive vs nonproductive cough ○ Note secretion management ● Check patient board with patient specifics	Begin to cough once it is clear that student is looking at vitals Keep your hand with O_2 under the blanket so student has to request Breathe normally, look fairly relaxed
Step 6: Verify voice by digital occlusion	● Student should explain upcoming procedure. ● Student should explain sensations the patient might feel. ● Using a gloved hand, occlude trach with thumb and ask patient to complete the following tasks: ○ Sustained vowel: say "AHHHH." ○ Automatic speech: "1, 2, 3, …." ○ Short phrases, like: "My name is XXX." ○ Answer a question, such as: "Is there anything you'd like to tell us?" ● If the patient's voice sounds wet, cue them to clear their throat/cough and try to voice again. ● If a patient has shown voicing ability with occlusion, proceed to PMV trial. Coughing is still typical here, as the patient works to clear secretions.	When a student explains the procedure, nod in understanding. Follow the student directions for any voicing that they ask you to do, while they occlude your trach with their finger. Intermittently throughout voicing trials, it is okay to cough, or make your voice sound "breathy."

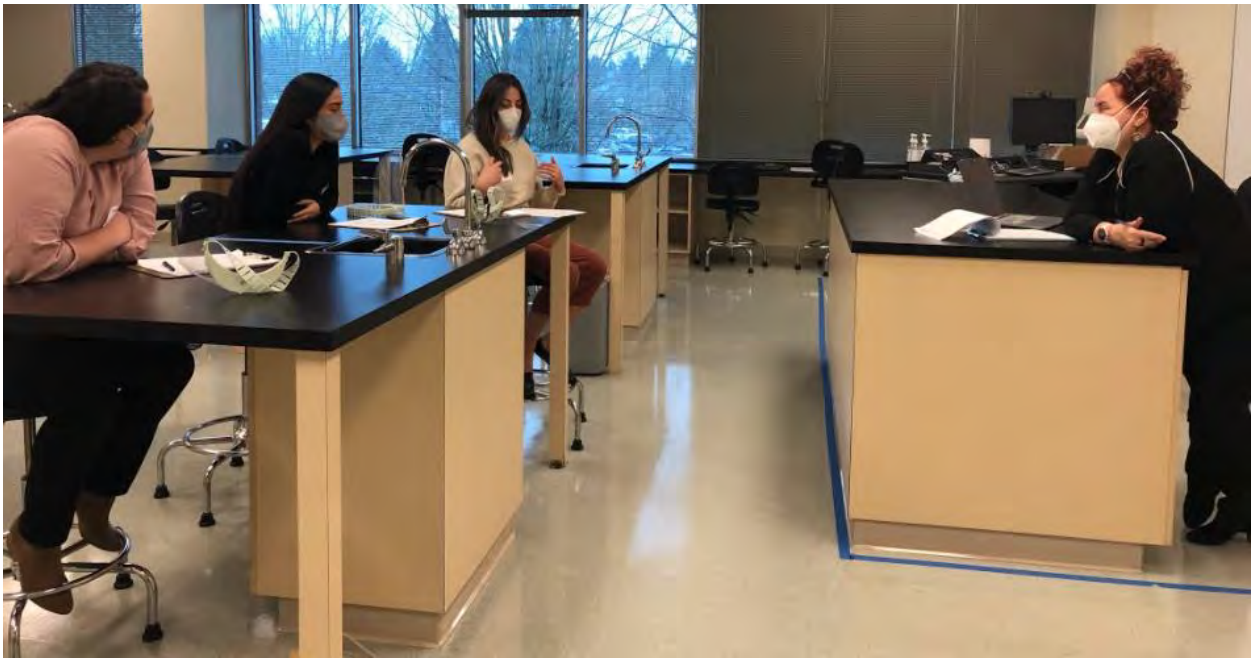
Table 2

Debrief Script for PMV simulation Using PEARLS Method

PEARLS Debrief Method Steps	Supervising Educator Script
Setting the Scene	"In this debriefing we will be spending between 30-40 minutes discussing your simulation experience. Our goal here is to improve how we communicate with and care for our patients. Everyone here is intelligent and wants to improve."
Reactions	"What are your initial reactions?" "How are you feeling?"
Description	"Can someone please share a summary of the simulation." "Is there anything anyone else would like to add to this?"
Analysis	"At this point I would like us to spend some time talking about how you communicated with the patient Because one of the goals of this simulation was to allow you to practice both setting patient expectations and informing the patient of procedure steps in friendly language." "Now I would like to spend some time talking about your use of your counseling skills during the encounter because you were provided with many opportunities to utilize them to care for your patient." "How did you feel your clinical thinking skills were during the encounter or what struggles did you face?" "That was an excellent discussion. Is there anything any additional discussion related to (A gap you noticed)"
Application & Summary	"What are some of the take-aways from this discussion for our clinical practice?" "What is something you did well today?" "The key learning focus of today's simulation was on your clinical communication skills. This was embedded into a PMV trial. Your goal was to practice your counseling skills, your use of patient friendly language, your ability to set patient expectations, and your clinical thinking. Thank you all for your hard work today."

Figure 5

Example of Debrief with Students Following Simulation



Evaluators & Domains. To evaluate student performance, the SP and supervising educator CCS rubrics were examined. Rubrics were adapted from several simulation programs (Adrian et al., 2015; Rollins et al., 2020; Van Gelderen et al., 2019). Supervising educators completed an evaluation rubric for each student both within the simulation itself and within the student debriefing session. The SP completed a student performance rubric following each simulation group. Nine different domains were evaluated by one or more raters (see Table 3). The majority of domains were rated using a 4-point response scale with the following anchors: not met (1), needs improvement (2), met (3), and exceeds (4). The Evaluation/Self-analysis and Commitment to Improvement domains were rated using a 4-point response scale but with different anchors: beginning (1), developing (2), accomplished (3), and exemplary (4). When possible, an average domain score was computed based on both the SP and supervising educator ratings.

Data Analyses. The students' performance on the simulation, both within each domain and across domains, was assessed using one-sample *t* tests. Specifically, a rating of three (i.e., met or accomplished) was used as the test value to see if the student evaluative ratings were significantly higher or lower on average. The ratings of students' average performance on the simulation made by the SP and supervising educator were compared using paired-sample *t* tests, within each applicable domain.

Table 3

Domains of Performance Rated by Supervising Educator, Standardized Patient, or Both

Evaluative Area	Evaluator	
	Educator	SP
Rate the student performance on Use of Terminology	Yes	Yes
Rate the student performance on Delivery	Yes	Yes
Rate the student performance on their Patient Preparation	Yes	Yes
Rate the student performance on Delivers Compassionate Care	Yes	No
Rate the student performance on Professionalism & Empathy	Yes	No
Rate the student performance on Communication Style	No	Yes
Rate the student performance on Positioning	No	Yes
Rate the student performance on Evaluation/Self-analysis	Yes	No
Rate the student performance on Commitment to Improvement	Yes	No

Measures of central tendency and dispersion were computed for specific items assessing the student's evaluation of the simulation from the Qualtrics survey in Appendix C. The students provided assessment of the simulation (using a 5-point Likert-type response scale ranging from strongly disagree (1) to strongly agree (5).The analyses presented below focused on the specific items from the full Qualtrics survey (see Appendix C).

1. I am confident that I am mastering the content of the simulation activity that my instructors presented to me.
2. I am confident that this simulation covered critical content necessary for the mastery of medical surgical curriculum.
3. I am confident that I am developing the skills and obtaining the required knowledge from this simulation to perform necessary tasks in a clinical setting.

Finally, correlational analyses were conducted to determine if relations existed between performance ratings made by both the SP and supervising educator and the students' evaluation of the simulation.

Results

Research Question 1: What was the level of student performance within the simulation when rated by supervising educators and the SP on CCS rubrics? Measures of central tendency and dispersion were computed based on ratings of students' performance (n = 29) by the SP and the supervising educator ("Educator") or just the supervising educator (where the SP is not included) on each evaluative domain. Across domains, the highest average rating was in the Commitment to Improvement domain, and the lowest was in Delivery.

Table 4

Measure of Central Tendency and Dispersion of Student Evaluative Domains (n = 29)

Evaluative Area	*M*	*SD*	*Mdn*	Min	Max
Use of Terminology (SP & Educator)	2.86	0.23	3.00	2.50	3.00
SP	3.00	0.00	3.00	3.00	3.00
Educator	2.72	0.46	3.00	2.00	3.00
Delivery (SP & Educator)	2.60	0.43	2.50	1.50	3.00
SP	2.45	0.51	2.00	2.00	3.00
Educator	2.76	0.51	3.00	1.00	3.00
Patient Preparation (SP & Educator)	2.79	0.34	3.00	2.00	3.00
SP	2.86	0.35	3.00	2.00	3.00
Educator	2.72	0.46	3.00	2.00	3.00
Delivers Compassionate Care	2.76	0.44	3.00	2.00	3.00
Professionalism & Empathy	2.72	0.46	3.00	2.00	3.00
Communication Style	2.72	0.46	3.00	2.00	3.00
Positioning	2.69	0.47	3.00	2.00	3.00
Evaluation/Self-analysis	3.07	0.46	3.00	2.00	4.00
Commitment to Improvement	3.14	0.44	3.00	2.00	4.00

The students' performance on the simulation, both within each domain and across domains, was assessed using one-sample *t* tests. Specifically, a rating of three (i.e., met or accomplished) was used as the test value to see if the student evaluative ratings were significantly higher or lower on average. The average student rating was computed across all evaluators when applicable. Standardized values (or *z*-scores) for each domain rating were examined and no outliers were found (i.e., > +/- 3.29). The normality assumption was assessed via the Shapiro-Wilk test, and the distributions for all nine domains were found to be significantly non-normal. Thus, a bootstrap method was used to produce bias corrected accelerated (BCa) confidence intervals for the one-sample *t* tests. The average rating for seven of the nine domains was found to be significantly different than the test value or a rating of three, indicating the student "met/accomplished" the domain objective (see Table 5). Specifically, the students' average rating in almost every domain was significantly lower than a rating of three. This was the primary reason that median was chosen as a more accurate descriptor of student performance. The two exceptions were the Evaluation/Self-analysis and the Commitment to Improvement domains, where the students' average rating was slightly above three, but not significantly larger than the test value.

Table 5

One-Sample t Test Statistics by Evaluative Domain (n = 29)

Evaluative Area	*t*	*p*	95% BCa CI	*d*[a]
Use of Terminology	-3.27	.003	-0.21, -0.07	0.59
Delivery	-4.96	< .001	-0.52, -0.28	0.90
Patient Preparation	-3.27	.001	-0.33, -0.10	0.59
Delivers Compassionate Care	-2.99	.003	-0.35, -0.14	0.54
Professionalism & Empathy	-3.27	.003	-0.41, -0.17	0.59
Communication Style	-3.27	.001	-0.41, -0.17	0.59
Positioning	-3.55	.001	-0.45, -0.21	0.64
Evaluation/Self-analysis	0.81	.42	-0.07, 0.21	0.15
Commitment to Improvement	1.68	.10	0.00, 0.28	0.30

Note: [a] Hedges' correction was made to Cohen's *d* values.

Research Question 2: Did the SP and supervising educators rate students' performance differently on CCS rubrics? The ratings of students' average performance on the simulation made by the SP and supervising educator were compared using paired-sample *t* tests, within the following three domains of CCS: Use of Terminology, Delivery, and Patient Preparation. Standardized values (or *z*-scores) of the difference scores for each domain rating were examined and no outliers were found (i.e., > +/- 3.29). The normality assumption was assessed via the Shapiro-Wilk test, and the distributions of the difference scores of each domain were found to be significantly non-normal. Thus, a bootstrap method was used to produce bias corrected accelerated (BCa) confidence intervals for the paired-sample *t* tests. The results indicated that the mean rating of the supervising educator was significantly different than the mean rating of the SP for the Use of Terminology domain; $t(28) = -3.27$, $p = .003$. 95% BCa CI [-0.41, -0.14], $d = 0.60$. In addition, the mean rating of the supervising educator was significantly different from the mean rating of the SP for the Delivery domain; $t(28) = 3.09$, $p = .005$. 95% BCa CI [0.14, 0.48], $d = 0.57$. Lastly, the mean rating of the supervising educator was not significantly different from the mean rating of the SP for the Patient Preparation domain; $t(28) = -1.68$, $p = .10$. 95% BCa CI [-0.31, 0.03], $d = 0.31$.

Research Question 3: What was the students' overall evaluation of success of the simulation with respect to their mastery of content and skills? Measures of central tendency and dispersion were computed for specific items from the full Qualtrics survey (Appendix C) to analyze the student's ($n = 29$) evaluation of the simulation (see Table 6). The students provided assessment of the simulation, using a 5-point Likert-type response scale ranging from strongly disagree (1) to strongly agree (5). In addition, students rated the importance of certain aspects of the simulation using a 5-point Likert-type response scale ranging from unimportant (1) to very important (5).

Table 6

Measures of Central Tendency and Dispersion for Items Assessing Student Evaluation of the Simulation

Survey Item	*M*	*SD*	*Mdn*	Min	Max
I am confident that I am mastering the content of the simulation activity that my instructors presented to me.	4.24	.689	4	3	5
I am confident that this simulation covered critical content necessary for the mastery of medical surgical curriculum.	4.76	.511	5	3	5
I am confident that I am developing the skills and obtaining the required knowledge from this simulation to perform necessary tasks in a clinical setting.	4.62	.561	5	3	5

Note: The survey in its entirety is in Appendix C.

Research Question 4: Was there a relation between students' overall evaluation of the simulation and their performance as rated by the SP and supervising educators on CCS rubrics? Finally, correlational analyses were conducted to determine if relationships existed between performance ratings made by supervising educators or SP and students' assessments of the simulation. An average score was computed for each student across the three survey items presented above. The average score was then correlated with the evaluator domain scores on each of the nine domains, as well as on an average score across all domains (see Table 7).

Standardized values (or *z*-scores) were computed, and no outliers were found (i.e., > +/- 3.29), except when the average Educator rating of the Delivery domain was examined, however the outlying value was negligible (i.e. $z = -3.44$). The linearity assumption was met based upon the examination of bivariate scatterplots. The normality assumption was assessed via the Shapiro-Wilk test, and the majority of the distributions were found to be significantly non-normal. Thus, a bootstrap method was used to produce bias corrected accelerated (BCa) confidence intervals for the tests of the correlation coefficients. None of the bivariate correlation coefficients ($N = 29$) were statistically significant at the .05 alpha level.

Discussion

This study provides an example of a high-fidelity replicable simulation that can be implemented to measure and encourage student skills development in CCS. The simulation itself provided an opportunity to measure students' CCS in the context of a speaking valve trial with a tracheostomy patient. Although student skills were measured at just one point in time, research supports that high-quality debrief that encompasses reflection increases the likelihood of clinical growth and skill development (Dunfee et al., 2008; Decker et al, 2021).

Table 7

Correlation Statistics between Average Perception Score and Average Evaluative Score

Evaluative Area	*r*	95 % BCa CI
Use of Terminology	.06 [a]	-.25, .43
Delivery	-.19 [a]	-.48, .07
Patient Preparation	-.06 [a]	-.27, .40
Delivers Compassionate Care	-.10 [a]	-.43, .26
Professionalism & Empathy	-.29 [a]	-.55, .003
Communication Style	-.12	-.45, .20
Positioning	-.25	-.55, .09
Evaluation/Self-analysis	-.19 [a]	-.52, .19
Commitment to Improvement	-.03 [a]	-.37, .33
Average Across Domains	-.21 [a]	-.54, .12

Note: [a] Based on educator rating only

Overall, results from this simulation show that most students have emerging, or have already developed, effective CCS within this context. The SP and supervising educators judged the students' CCS in the areas of (a) terminology use, (b) delivery, (c) patient preparation, (d) delivering compassionate care, (e) demonstrating professionalism and empathy, and (e) communication style. Students also evaluated the simulation itself and reported that it was beneficial to their learning, provided an opportunity to demonstrate skills, and was executed well. For this discussion, each research question will be discussed separately in the following sections.

Student Performance on Simulation. The driving questions for this study sought to examine how students performed within the simulation through rubric ratings by the SP and supervising educators. Across all nine evaluated domains, *delivery* was the only domain with a median below 3.00, indicating an area in need of improvement. Within the rubric, delivery was defined as:

- Met (3): Clinician is relaxed and comfortable, speaks without undue reliance on notes, and interacts effectively with client.
- Needs Improvement (2): Clinician is generally relaxed and comfortable, but too often relies on notes. Client is sometimes ignored or misunderstood.
- Not Met (1): Clinician appears anxious and uncomfortable and reads notes, rather than speaks. Client is largely ignored.

The domain of delivery was also the only area assessed where one or more students received a score of “not met.”

Another driving question for this study was if the SP and supervising educators rated students differently on performance when comparing rubric measurements overall. Within the category of delivery, the SP rated a median number of students as 2.00 while the supervising educators rated a median number of students as 3.00. These scoring differences led to an average domain score of

2.5. In other words, the two supervising educators rated students as meeting criteria for delivery within the simulation while the SP did not. This may have been the result of allowing students to keep the speaking valve procedure outline with them during the simulation, as CCS were the main focus of the simulation. The SP may have interpreted students' use of the speaking valve procedure notes as "too often relying on notes," while the supervising educators felt this was permissible and aligned with their simulation design. This notion is supported by qualitative comments on the SP rubrics stating "notes were far away, needed support and didn't seem prepared," "lots of note checking so broke up the fluidity," and "slightly unsure- as though they were thinking of what to do next. not casual." Qualitative comments from the supervising educators under the domain of delivery indicated that most students remained calm while the patient seemed stressed, seemed confident in their delivery of information, and transitioned well between tasks. One example of a supervising educator's comment was, *"Great job staying calm while client was coughing, calm delivery with instructions for breathing."* There is evidence from medical literature that clinical competence (ability to complete the clinical task) and communication skills (as mentioned above by the SP) are interdependent and difficult to fully separate from each other (Colliver et al., 1999). It would be impossible to separate the intersectionality of those two dimensions of practice when considering student performance in this specific simulated experience, as they are likely related to each other with SLP graduate student performance ratings as well.

In all other performance domains, the students demonstrated adequate skills. The domains of terminology use, patient preparation, and positioning sought to evaluate how the student communicated professional information, their procedures, and their proximity to the patient. Use of terminology is a particularly important CCS because use of medical jargon has shown to impact patient understanding and negatively impact prognosis (Rimmer, 2014). Student positioning (i.e., their comfortable proximity and orientation to the patient) was also critically evaluated by the SP. This turned out to be a revealing measurement tool as numerous students told the SP to "tap them on the arm" if they needed something during the procedure. The SP indicated that several the students were standing too far away or seemed distinctly uncomfortable coming close for the majority of the procedure, which would have made it difficult or impossible for the SP to tap their arm. Although most students performed adequately with positioning, this skill could be better emphasized in future simulations to draw attention to the importance of body position as it relates to client communication, comfort, and rapport building.

Students were also evaluated on other CCS areas including their demonstration of compassionate care, their professionalism and empathy, and their overall communication style. Students performed well across these skills, but several qualitative comments reveal a number of strengths and weaknesses across student performance. The following examples of comments provided by the supervising educators reveal positive and negative comments for each domain.

- Delivers Compassionate Care
    - "I will walk you through this, I am right here with you"
    - "It's all going to be okay"
    - "Oh geez, okay, we are going to pause the trial here, I am going to take the valve off and let you get back to breathing here"; could have asked him to take deep breaths with the valve on. Also - "oh geez" might not be great to hear from patient perspective. Other interactions were more compassionate.

    - Nice job validating the patient's performance; "Is there anything you want to say before we remove the valve?"
- Professionalism & Empathy
    - "one more time my friend" - lovely rapport establishment
    - take a moment to go a little slower
- Communication style
    - seemed rushed, seemed like needed notes or nervous
    - a bit stiff - seemed not as confident; not as comfortable; lacks fluidity - felt pressured
    - up-beat; liked to talk

Research has shown that communication style and compassion are critical for the development of relationships that facilitate the therapeutic alliance and help patients with communication disorders feel validated by their SLP (Bright & Reeves, 2022). Teaching SLP students CCS explicitly is one way to support their communication style and facilitate the therapeutic alliance which can result in improved patient treatment outcomes overall (Brown, 2010).

Lastly, students were evaluated on their ability to perform self-analysis and their commitment to improvement during the debrief. Both the mean and median of student performance were rated at or above a 3.00, indicating accomplished or exemplary performance within the debrief. Debrief has consistently been shown to be an integral part of simulation education where most of the student learning occurs. Debriefing immediately following a simulation offers an opportunity for additional feedback, reflection, and reconnection to the learning objectives (Dudding et al., 2019). Furthermore, debriefing allows students to connect the simulation to their clinical practice, increasing the likelihood of generalization to their practice (Decker et al., 2021). Broadly, the various forms of debriefing have three primary functions including: a) promoting learner self-assessment, b) facilitating discussion to promote reflection, and c) providing directive feedback (Cheng et al., 2016). In the PEARLS approach, these functions are combined to provide a flexible approach to debriefing for any healthcare simulation (Eppich & Cheng, 2015; Cheng et al., 2016). This flexible and multifaceted approach is one reason why PEARLS was chosen as the primary debrief approach for the present simulation.

Qualitative comments from the supervising educators made during the debrief indicate that students often focused on the negative aspects of their performance. For example, one student commented in debrief that, “It is important to reflect on strengths too, not just weaknesses. Think about all of the things you thought your groupmates did well and use that to guide your own critical thinking.” Other comments from several students indicated that they used the debriefing opportunity to reflect on their performance and make plans for performance change. One supervising educator observed, “Nice brainstorming of ways to help yourself in future scenarios, as well as future students in this simulation.” Supervising educators commented that they believed the debrief process served to solidify student learning from the simulation and helped them to process the experience in a safe learning environment. This is consistent with literature detailing that debriefing spaces should be safe learning environments that encourage transparent discussion for transfer of learning (Decker et al., 2021).

Student Feedback & Evaluation of Simulation. Another driving question for this study was to understand students' evaluation of the simulation itself and its perceived impact on their learning. Immediately following the debrief, students completed a Qualtrics survey and feedback was collected across several areas of simulation design, including a) structure, b) opportunities to receive guidance and feedback, c) working with peers, and d) debriefing about their learning. Average student ratings for all of these areas were positive (i.e., between four and five), on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Within the debriefing sessions, students provided further feedback about the simulation structure.

Despite receiving consistent messaging prior to the simulation day that they would have all the materials they needed to succeed in the simulation, and that there would be no "surprises," a number of students reported that they still expected to be "tricked" or "surprised" during the simulation. There were opposing views regarding the small group structure of the simulation. While some students appreciated having other peers in the simulation, others stated they would have preferred going through the experience individually. Students also reported that though they believed they had prepared well for the entirety of the procedure, they wished they had known what steps of the speaking valve procedure they would have to execute specifically during the simulation. Positively, many students reported that they could not believe how "real" the simulation felt and that they "forgot it was a simulation." Literature supporting best-practices in simulation consistently cites fidelity as a key component to effective simulation (Dudding et al., 2019; Watts et al., 2021). Simulation design is most successful when it focuses on representing stimuli and cues that would typically be present during the clinical encounter that would drive decision-making (Tun et al., 2015), and includes the realism of the SP performance. SPs represent a simulation modality that offers inherently high-fidelity qualities as long as best practices in SP preparation are followed (Carey & Rossler, 2022).

Students also had the opportunity within the feedback survey to evaluate their perceptions of their own learning from the simulation. Students indicated on average that they believed they were mastering the content evaluated within the simulation. Furthermore, they were confident that the simulation covered critical content related to their field, and that they would be able to perform these tasks in a clinical setting. Self-efficacy improvement was also found post-simulation for SLPs learning tracheostomy management (Miles et al., 2019).

Relationship Between Student Performance and Perception. Finally, the study investigated if there was a relationship between how the student performed on the simulation and how they rated the simulation. Correlation analysis found no significant correlation between student performance and self-analysis. Although not statistically significant, several negative correlations were found, indicating that those students who were rated as performing more poorly on SP or supervising educator rubrics (or both) within the simulation rated themselves highly on self-assessment rubrics. This could be due to several reasons, including the score compression of student performance relative to only having a 3-point Likert scale available. Additionally, the posed questions within the feedback survey may not directly probe student perception of performance, but instead perception of usefulness of the simulation. High self-efficacy has been shown to predict better clinical performance in SLP students, so it is necessary to effectively probe perceived success in simulations (Pasupathy & Bogschutz, 2013; Lee & Schmaman, 1987). Research has also indicated that students report increased communication knowledge and confidence specifically after

working with SPs (Quail et al., 2016).

Limitations and Future Directions

One limitation of the current simulation was the small group design which resulted in students having differing opportunities to demonstrate skills. Additionally, overall performance in communication skills may intersect with clinical competence of the specific clinical task (Colliver et al., 1999). These two skills likely intersect with each other and are difficult to separate when evaluating student performance. Another limitation is that the SP and the supervising educators did not evaluate all the same domains within student performance. Although this was intentional, the variability in ratings from the SP and supervising educators may mean that student performance is not accurately captured.

Future directions for this simulation include use of an additional student rubric, similar to the supervising educator and SP rubrics, for students to complete post-simulation which may allow for more realistic self-appraisal in terms of their own clinical performance. Use of a student-rated rubric would also allow for more accurate comparisons between student evaluation of the simulation and SP/supervising educator ratings. Additionally, expansion of the 3-point Likert scale used to rate communication domains to include more rating options would likely allow for better assessment of student performance variability. Future studies could also more loosely examine the reliability between raters and engage in more robust calibration training for those scoring student rubrics. Lastly, careful consideration should be given to refine the student feedback questions on the final simulation assessment questionnaire to better capture student perceived learning.

Conclusion

Effective clinical communication is understood to be a crucial part of quality patient care and can help to develop a strong therapeutic alliance (Bright & Reeves, 2022). Effective clinical communication is a skill that can be trained and improved upon with practice and simulation is one modality that can be used to allow students to practice CCS in a safe environment. As literature has indicated, teaching communication skills directly develops an appreciation for the skills as actual skills. Literature has pointed to a number of ways to support student learning in CCS, and in the absence of a standalone course or independent training, simulation can provide opportunity for efficient and effective learning of communication skills. Implementing a simulation with standardized patients affords the additional benefits of more authentic patient interaction where the skills can be practiced by students and directly observed by educators. Finally, the ability for structured debrief and feedback from both educator and SP provides increased likelihood of carryover to actual clinical practice. Simulations, such as this one, provide viable models for teaching CCS to SLP students.

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Appendix A

Full Standardized Patient Script and Student Procedure : Scenario Progression

Order	Step	Student Actions	Patient Actions
1		Students enter the room	Look surprised, look around
2		Student introduces themselves; puts on gloves Student explain why they are there	If students introduce themselves then visibly relax Use white board to say hello try to shift in bed
3	Verify and record baseline vital signs	● Monitor starting patient vitals: ○ Respiratory rate (work of breathing) ○ Heart rate ○ O2 saturations ○ Note productive vs nonproductive cough ○ Note secretion management ● Check patient board with patient specifics	Patient cough once it's clear that student is looking at vitals Have patient hand with o2 under blanket so student has to request breath normally Look fairly relaxed
4	Deflate cuff and monitor vital signs	● Student should explain procedure ● Slowly deflate cuff using syringe (~1cc at a time), monitoring patient reaction as you go ● Once the cuff is fully deflated, monitor patient's vital signs over 1 minute ○ Respiratory rate (work of breathing) ○ Heart rate ○ O2 saturations ○ Note productive vs nonproductive cough ○ Note secretion management	As the cuff deflates patient should cough quite a bit then stop after a few seconds Look a bit apprehensive Take some deep breath before relaxing again gesture for white board, when received write "How did I do?" then laugh turns into cough
5	Verify breathing/	● Student should explain upcoming procedure	When student explains the procedure seem calm

	respiration by occlusion (Operator slightly increase heart rate)	● Student should explain sensations the patient might feel ● Using a gloved hand, occlude the trach opening for 10 seconds with your thumb. ○ Prompt the client to breathe through their nose, then through their mouth. ○ The patient may feel distressed, and need to "relearn" to breathe through the upper airway.	When they explain the sensations seem a bit more anxious As a student reaches to cover the trach for the first time. Look anxious, block their hands and gesture for "1 minute" On second attempt allow students to cover trach. Breathe a bit faster than normal. If student does not prompt you on how to breathe, breathe through your mouth.
6	Verify voice by digital occlusion (Operator decrease heart rate)	● Student should explain upcoming procedure ● Student should explain sensations the patient might feel ● Using a gloved hand, occlude trach with thumb and ask patient to complete the following tasks: ○ Sustained vowel: say "AHHHH" ○ Automatic speech: "1, 2, 3, …." ○ Short phrases, like: "My name is XXX." ○ Answer a question, such as: "Is there anything you'd like to tell us?" ● If the patient's voice sounds wet, cue them to clear their throat/cough and try to voice again. ● If a patient has shown voicing ability with occlusion, proceed to PMV trial. Coughing is still typical here, as the patient works to clear secretions.	When a student explains the procedure, nod in understanding. Follow the student directions for any voicing that they ask you to do, while they occlude your trach with their finger. Intermittently throughout voicing trials, it is okay to cough, or make your voice sound "breathy"
7	Apply speaking	● Student should explain upcoming procedure	Remain calm while the student explains the

	valve and monitor for vital changes during simple breathing task	● Student should explain sensations the patient might feel ● Apply speaking valve over trach with gloved hand. ● Instruct the patient to continue to breathe as normally as possible. Look for signs of distress. ● Monitor/record patient vitals: ○ Respiratory rate (work of breathing) ○ Heart rate ○ O2 saturations ○ Note productive vs nonproductive cough ○ Note secretion management ● If the patient is tolerating the valve, proceed to voice trials.	procedure and places the speaking valve. Once speaking valve is on, breathe a little more deeply and quickly through your nose and wait for the student to cue you to "try to breathe as normally" as possible to slow down your breathing.
8	Voice trials with speaking valve (Operator decrease O2 saturation)	● Student should explain upcoming procedure ● With the speaking valve placed, cue the patient to complete the following tasks: ○ Sustained vowel: say "AHHHH" ○ Automatic speech: "1, 2, 3, …." ○ Short phrases, like: "My name is XXX." ○ Answer a question, such as: "How are you feeling today?" ● If the patient's voice sounds wet, cue them to clear their throat/cough and try to voice again. ● Listen to voice quality, and monitor/record patient vitals: ○ Respiratory rate (work of breathing) ○ Heart rate ○ O2 saturations ○ Note productive vs nonproductive cough ○ Note secretion management	Follow student instructions for voicing with speaking valve on. Remain calm with voicing trials. Describe how it is such a relief to be able to use your voice again!
9	Continue with the	● If you complete your voice trials, and your patient is tolerating the	Seem grateful and thankful for encounter

	speaking valve trial to allow the patient to tolerate the valve for longer periods of time. If the patient is stable, leave the valve on. (Operator return O2 to normal following PMV removal)	speaking valve well, you can leave it on the patient. ● Be sure to communicate this with the patient, their family, and their nurse. ● Work with the respiratory therapy to discuss dosage for leaving the valve on, and provide education to the patient. ● Monitor that vitals are stable throughout the trial period, and instruct the patient to hit the call button if needed throughout the process. ○ Respiratory rate (work of breathing) ○ Heart rate ○ O2 saturations ○ Note productive vs nonproductive cough ○ Note secretion management	Decline to ask questions Use white board thank SLP Wave goodbye

Appendix B

Evaluation Rubrics Used by Standardized Patient, Supervising Educator, and Debrief

Standardized Patient Rubric - Clinical Communication Simulation			
Care Constructs	Met 3 Points	Needs Improvement 2 Points	Not Met 1 Point
Communication style	Communication was fluid, therapeutic, open-ended; attentive listening skills were used	Communication lacks fluidity, was open-ended; distracted in listening skills; communication was rushed	Communication was directive; advice giving type of communication; listening not used
Use of Terminology	Discussion and terminology used were appropriate for client/family understanding; Used a follow-up question to verify family understanding	Communication occasionally used inappropriate medical terminology and jargon; No follow up question was used	Communication used medical terminology and jargon inappropriate for understanding; No follow up question was used
Positioning	Position was appropriate with full engagement; Interview/conversation felt respectful toward client/family	Position was appropriate at times; sometimes perceived as unengaged; Ex. professional focused on technology	Position was inappropriate and unengaged and perceived as over-powering toward client/family
Delivery	Clinician is relaxed and comfortable, speaks without undue reliance on notes, and interacts effectively with client	Clinician is generally relaxed and comfortable, but too often rely on notes. Client is sometimes ignored or misunderstood	Clinician appears anxious and uncomfortable and reads notes, rather than speaks. Client is largely ignored.

Patient Preparation	Clinician explains each step of a procedure and asks permission to enact procedure requiring proximity and touching	Clinician explains some procedures to patient; some use of jargon; asks permission to touch patient or create discomfort sometimes	Clinician disregards patient bodily autonomy and executes procedures without consent; does not explain procedure steps or uses jargon

Supervising Educator In Simulation Rubric - Clinical Communication Simulation

Care Constructs	Met 3 Points	Needs Improvement 2 Points	Not Met 1 Point
Use of Terminology	Discussion and terminology used were appropriate for client/family understanding; Used a follow-up question to verify family understanding	Communication occasionally used inappropriate medical terminology and jargon; No follow up question was used	Communication used medical terminology and jargon inappropriate for understanding; No follow up question was used
Delivers Compassionate Care	Made a positive impression on family through engagement such as offering: ● Support ● Hope ● Empathy Ex. “How may I best support your family through this time?”	Made an indifferent/ambiguous impression toward the family. Lacked family engagement, may have mixed emotions of perceived support, hope, and empathy; Ex. inaccurate assumptions about the family	Made a negative impression on family; no family engagement; did not offer support, hope, empathy; Ex. Hostility ad overtones of power; emotional stance (anger, aloof, distracted, irritated, prejudice)
Professionalism & Empathy	Clinician shows professionalism toward their client, and is caring and compassionate. They are organized in the methods they use to explain information accurately to their client	Clinician has focus and provides some evidence that supports their client in a compassionate and knowledgeable way	No apparent professional or empathetic skills. Poor communication skills with client and a lack of compassion
Patient Preparation	Clinician explains each step of a procedure and asks permission to	Clinician explains some procedures to patient; some use of jargon; asks	Clinician disregards patient bodily autonomy and executes procedures

	enact procedure requiring proximity and touching	permission to touch patient or create discomfort sometimes	without consent; does not explain procedure steps or uses jargon
Delivery	Clinician is relaxed and comfortable, speaks without undue reliance on notes, and interacts effectively with client	Clinician is generally relaxed and comfortable, but too often rely on notes. Client is sometimes ignored or misunderstood	Clinician appears anxious and uncomfortable and reads notes, rather than speaks. Client is largely ignored.

Supervising Educator In Debrief Rubric- Clinical Communication Simulation				
Care Constructs	Exemplary (4-Points)	Accomplished (3-Points)	Developing (2-Points)	Beginning (1-Point)
Evaluation/ self-analysis	Independently evaluates and analyzes personal clinical performance, noting decision points, elaborating alternatives, and accurately evaluating choices against alternatives	Evaluates and analyzes personal clinical performance with minimal prompting, primarily about major events or decisions; key decision points are identified, and alternatives are considered	Even when prompted, briefly verbalizes the most obvious evaluations; has difficulty imagining alternative choices; is self-protective in evaluating personal choices	Even prompted evaluations are brief, cursory, and not used to improve performance; justifies personal decisions and choices without evaluating them
Commitment to improvement	Demonstrates commitment to ongoing improvement; reflects on and critically evaluates clinical experiences; accurately identifies strengths and weaknesses and develops specific plans to eliminate weaknesses	Demonstrates a desire to improve clinical performance; reflects on and evaluates experiences; identifies strengths and weaknesses; could be more systematic in evaluating weaknesses	Demonstrates awareness of the need for ongoing improvement and makes some effort to learn from experience and improve performance but tends to state the obvious and needs external evaluation	Appears uninterested in improving performance or is unable to do so; rarely reflects; is uncritical of himself or herself or overly critical (given level of development); is unable to see flaws or need for improvement

Appendix C

Measures of Central Tendency and Dispersion for Items Assessing Student Evaluation of the Simulation

The following directions were provided for the survey. Two side-by-side columns were presented representing assessment of educational practices and importance.

Use the following rating system when assessing the educational practices:

1 - Strongly Disagree with the statement

2 - Disagree with the statement

3- Undecided - you neither agree or disagree with the statement

4 - Agree with the statement

5 - Strongly Agree with the statement

NA - Not Applicable; the statement does not pertain to the simulation activity performed.

In the column to the right, please rate each item based upon how important that item is to you.

1 - Not Important

2 - Somewhat Important

3 - Neutral

4 - Important

5 - Very Important

Survey Item	*M*	*SD*	*Mdn*	Min	Max
Q1#1_1 Assessment I had the opportunity during simulation activity to discuss the ideas and concepts taught in the course with the teacher and other students.	4.72	0.841	5.00	1	5
Q1#1_2 Assessment I actively participated in the debriefing sessions after the simulation.	4.79	0.787	5.00	1	5
Q1#1_3 Assessment I had the opportunity to put more thought into my comments during the debriefing session.	4.83	0.759	5.00	1	5
Q1#1_4 Assessment There were enough opportunities in the simulation to find out if I clearly understand the material.	4.24	1.023	5.00	1	5

Q1#1_5 Assessment I learned from the comments made by the teacher before, during, or after the simulation.	4.57	0.836	5.00	1	5
Q1#2_1 Importance I had the opportunity during simulation activity to discuss the ideas and concepts taught in the course with the teacher and other students.	4.74	0.526	5.00	3	5
Q1#2_2 Importance I actively participated in the debriefing sessions after the simulation.	4.81	0.396	5.00	4	5
Q1#2_3 Importance I had the opportunity to put more thought into my comments during the debriefing session.	4.78	0.424	5.00	4	5
Q1#2_4 Importance There were enough opportunities in the simulation to find out if I clearly understand the material.	4.89	0.320	5.00	4	5
Q1#2_5 Importance I learned from the comments made by the teacher before, during, or after the simulation.	4.85	0.368	5.00	4	5
Q2#1_1 Assessment I received cues during the simulation in a timely manner.	4.28	1.018	5.00	2	5
Q2#1_2 Assessment I had the chance to discuss the simulation objectives with my teacher.	4.76	0.511	5.00	3	5
Q2#1_3 Assessment I had the opportunity to discuss ideas and concepts taught in the simulation with my instructor.	4.83	0.468	5.00	3	5
Q2#1_4 Assessment The instructor was able to respond to the individual needs of learners during the simulation.	4.44	0.961	5.00	2	5
Q2#1_5 Assessment Using simulation activities made my learning time more productive.	4.86	0.351	5.00	4	5
Q2#2_1 Importance I received cues during the simulation in a timely manner.	4.00	1.200	4.00	1	5
Q2#2_2 Importance I had the chance to discuss the simulation objectives with my teacher.	4.67	0.620	5.00	3	5
Q2#2_3 Importance I had the opportunity to discuss ideas and concepts taught in the simulation with my instructor.	4.93	0.267	5.00	4	5
Q2#2_4 Importance The instructor was able to respond to the individual needs of learners during the simulation.	4.70	0.724	5.00	3	5
Q2#2_5 Importance Using simulation activities made my learning time more productive.	4.85	0.362	5.00	4	5
Q3#1_1 Assessment I had the chance to work with my peers during the simulation.	4.38	0.983	5.00	1	5

Q3#1_2 Assessment During the simulation, my peers and I had to work on the clinical situation together.	4.08	1.017	4.00	2	5
Q3#1_3 Assessment The simulation offered a variety of ways in which to learn the material.	4.71	0.460	5.00	4	5
Q3#1_4 Assessment This simulation offered a variety of ways to assess my learning.	4.62	0.622	5.00	3	5
Q3#1_5 Assessment The objectives for the simulation experience were clear and easy to understand.	4.79	0.491	5.00	3	5
Q3#1_6 Assessment My instructor communicated the goals and expectations to accomplish during the simulation.	4.86	0.351	5.00	4	5
Q3#2_1 Importance I had the chance to work with my peers during the simulation.	4.00	1.240	4.00	1	5
Q3#2_2 Importance During the simulation, my peers and I had to work on the clinical situation together.	3.93	1.245	4.00	1	5
Q3#2_3 Importance The simulation offered a variety of ways in which to learn the material.	4.75	0.518	5.00	3	5
Q3#2_4 Importance This simulation offered a variety of ways to assess my learning.	4.68	0.476	5.00	4	5
Q3#2_5 Importance The objectives for the simulation experience were clear and easy to understand.	4.86	0.356	5.00	4	5
Q3#2_6 Importance My instructor communicated the goals and expectations to accomplish during the simulation.	4.79	0.499	5.00	3	5
Q4_1 The teaching methods used in this simulation were helpful and effective.	4.86	0.351	5.00	4	5
Q4_2 The simulation provided me with a variety of learning materials and activities to promote my learning the medical surgical curriculum.	4.72	0.528	5.00	3	5
Q4_3 I enjoyed how my instructor taught the simulation.	4.83	0.384	5.00	4	5
Q4_4 The teaching materials used in this simulation were motivating and helped me to learn.	4.83	0.384	5.00	4	5
Q4_5 The way my instructor(s) taught the simulation was suitable to the way I learn.	4.76	0.511	5.00	3	5
Q5_4 My instructors used helpful resources to teach the simulation.	4.52	0.634	5.00	3	5

Q5_5 It is my responsibility as the student to learn what I need to know from this simulation activity.	4.76	0.511	5.00	3	5
Q5_6 I know how to get help when I do not understand the concepts covered in the simulation.	4.62	0.494	5.00	4	5
Q5_7 I know how to use simulation activities to learn critical aspects of these skills.	4.66	0.484	5.00	4	5
Q5_8 It is the instructor's responsibility to tell me what I need to learn from the simulation activity content during class time.	4.10	0.772	4.00	3	5