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Abstract

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Keywords

Online standardized patient simulation, virtual standardized patient simulation, occupational therapy simulation

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ABSTRACT

Campus closures during the COVID-19 pandemic led to the innovation of online standardized patient (SP) simulations. Extensive preparation with the faculty, simulation specialists, SPs, and 42 occupational therapy students was required to smoothly adapt an occupational therapy learning module from in-person to online simulations. The concepts of *functional task alignment* and *psychological fidelity* from the simulation literature guided the process of designing the online simulations. Post-simulation, student perceptions about learner engagement, psychological fidelity, and accomplishment of the simulation's learning outcomes were collected using anonymous surveys. All 36 survey respondents found the online SP encounters to be engaging. Most experienced realism in their emotional responses as well as the interpersonal and cognitive skills used during the simulation. Overall, students felt that the online simulations provided an effective way to meet the intended learning outcomes. Additionally, five individual student interviews were completed to further explore the students' overall experience as a simulation participant, challenges encountered, and how the online simulation experience could be improved. Emerging themes from the interview data were: (a) a stepping stone for learning, (b) realism of the experience, (c) physical fidelity, (d) limitations of being online, and (e) curriculum design and implementation. Findings suggest that online SP simulations are a promising innovation with multiple potential applications in occupational therapy education during a pandemic and beyond.

Introduction

Standardized patient (SP) simulations are well-established and commonly used in occupational therapy education (Bennett et al., 2017; Bethea et al., 2014; Shea, 2015). Standardized patients are trained actors who portray the role of a client, family member, or health care provider in simulated clinical scenarios, thus allowing students to practice clinical interaction skills in a safe environment (VanPuymbrouck et al., 2017). Occupational therapy students have reported in-person SP encounters to be beneficial for learning about various aspects of occupational therapy practice including: the evaluation process (Herge et al., 2013), collaboration with family members (Cahill, 2015), interprofessional teamwork (Bethea et al., 2019; McCave et al., 2019), professional identity (Bethea et al., 2019), and physical handling of clients and their medical equipment (Wu & Shea, 2021). Moreover, students have found simulated client encounters to be a “confidence booster” (Giles et al., 2014, p. S-63) prior to Level II fieldwork. In-person SP simulations have been an important element of our university’s occupational therapy curriculum design since 2008. Standardized patient simulations are incorporated as both formative and summative experiences across four different courses within the curriculum.

Virtual or web-based simulation-based learning had been used in occupational therapy and nursing education even prior to the pandemic (Huun, 2018; Nicola-Richmond & Watchorn, 2018). Typically, virtual simulations involve students viewing pre-recorded scenarios or publicly available videos and then completing specific assignments. Nicola-Richmond and Watchorn (2018) created and utilized 18 filmed scenarios depicting occupational therapists conducting simulated evaluations and interventions. The authors concluded that the simulation videos were an authentic learning resource that appeared to be more effective than written case studies for the development of empathy and clinical assessment skills in occupational therapy students (Nicola-Richmond & Watchorn, 2018).

During the COVID-19 pandemic, faculty and students worldwide pivoted to remote online learning (Ali, 2020). Courses in which hands-on skills were introduced and practiced posed additional challenges in a virtual platform (Eglseder & Littleton 2021). Virtual simulations of clinical scenarios quickly became the replacement tool for practical skills learning (Mitchell, 2020; Esposito et al., 2020; Peddle, 2019). During the pandemic, an innovation of online real-time simulation encounters with SPs was provided to social work and psychiatric mental health nurse practitioner students via video conferencing (Wynn, 2020). The nursing and social work students found the online SP encounters useful for acquiring needed clinical skills (Wynn, 2020). More recently, within occupational therapy education in the United Kingdom, Dadswell et al. (2021) incorporated online real-time simulations with trained actors as part of a Placement Replacement Module during COVID-19. Occupational therapy students reported satisfaction with the simulation encounter, which they found to be realistic and helpful for the development of practice skills (Dadswell et al., 2021). This current paper contributes to the emerging body of literature about the use of online SP simulations in occupational therapy education, specifically within didactic coursework rather than as a replacement for a fieldwork experience.

When our university campus closed due to worldwide shelter-in-place orders in the spring of 2020, we were challenged to adapt a learning module in which in-person SP simulations had been a central component. This challenge led to an educational innovation of *online* SP simulations. The adaptation process began with conceptualization and the identification of a guiding framework followed by extensive planning and preparation. Following implementation, feedback was collected from participants. The purpose of this paper is to describe the adaptation process to online simulations and to explore occupational therapy students' responses to this new learning modality.

Adaptation of a Learning Module during the Pandemic

The learning module that was modified was part of a seminar course that focused on clinical application of fundamental knowledge and skills. Students took this course during their third semester of the occupational therapy program. The course included four modules; the duration of each module ranged from two to six weeks. The module for which online simulations were created, entitled "Client Interview in Acute Care," spanned six weeks. Students were tasked to complete an initial interview with a client who had a diagnosis of spinal cord injury, traumatic brain injury, or bipolar disorder. The module's learning outcomes were: (a) apply the Occupational Therapy Practice Framework (American Occupational Therapy Association, 2020), critical and clinical reasoning, relevant theories, and best evidence to a specific clinical scenario; (b) identify a client's occupational profile through a clinical interview; (c) establish a therapeutic relationship/rapport with a client through therapeutic use of self; and (d) critically review interview techniques and behaviors of self and peers. During in-person simulations, a pair of students interacted with a SP in a simulated hospital room for approximately 20 minutes while observing learners viewed the live video feed in another room.

Determining the Best Alternative Learning Activity

To select an alternative learning activity to the in-person SP simulations, two key criteria were used: meeting the learning outcomes and engaging the online learners. Meeting the learning outcomes is always a primary consideration when designing a learning activity (de Hei et al., 2016), particularly for online learning (Hines et al., 2020; Kyrkjebø, 2020). The second criterion about student engagement was used because the online environment creates additional challenges for learner engagement (Gillett-Swan, 2017). Various options of online learning activities that could achieve the learning outcomes were considered, including: discussing the case studies, role playing with peers or faculty, or viewing simulation recordings of the client cases from previous years. When online SP simulations via web conferencing became available at our university, the occupational therapy faculty and a simulation educator collaboratively determined that the learning outcomes and required clinical interactions for the "Client Interview" module could be effectively accomplished through online SP encounters. As reported by Bennett et al.'s (2017) review of simulation in occupational therapy curricula, students found interacting with SPs to be the most authentic simulation modality. Occupational

therapy students have found SP encounters to be highly engaging and valuable for their learning (Wu & Shea, 2020). Thus, online SP simulation was deemed as the best option for promoting student engagement and providing authenticity while meeting the intended learning outcomes.

Best Practices and Guiding Framework

In designing the online SP simulations, we retained the evidence-based best practices that had worked well with in-person simulations. These elements included: SP training with case coaching (Cantrell & Deloney, 2007), a safe container for the learners (Rudolph et al., 2014), immediate emotional debrief for the active learners (Palaganas et al., 2016), prompt SP feedback (Cantrell & Deloney, 2007), and video assisted debriefing (Ali & Miller, 2018). Hamstra et al.'s (2014) framework guided our adaptation to online simulations. This framework emphasizes *functional task alignment* rather than structural or physical fidelity, which is inherently limited when simulating an acute care setting online. Instead, emphasis is on specific methods to enhance transfer of learning, which include effective learner orientation, learner engagement, and functional task alignment with the learning objectives (Hamstra et al., 2014). In addition, Hontvedt and Øvergård's framework (2020) for configuring simulation fidelity with training objectives was used to configure the focus of this simulation on *psychological fidelity*. Psychological fidelity is conceptualized as "the simulation's activation of relevant problem-solving strategies, mental models and feelings" from the learners (Hontvedt & Øvergård, 2020, p. 86).

Preparation

The simulation case scenarios were adapted for the online format. For example, the client in the acute manic phase of bipolar disorder was given an additional diagnosis of a Grade III ankle sprain to justify why the client would remain seated during the clinical encounter. The occupational therapy faculty worked closely with our university's simulation technology specialists (STSs). These specialists commonly have professional experience in audio-visual, information technology, healthcare, or engineering, but they may come from almost any background (Crawford et al., 2019). They have expertise in the technical and operation aspects of simulation planning and implementation and in troubleshooting operational problems related to simulation technology. The occupational therapy faculty and the STSs met multiple times to work through many logistical decisions such as the scheduling model, a detailed sequence of events for simulation day, and contingency planning for technology glitches. To promote physical fidelity and environmental realism for the learners (Carey & Rossler, 2021), we prepared a visual image of a hospital room to be displayed prior to the start of each simulation to help set the scene.

Extensive training was provided to the six SPs. First, the STSs met with each SP individually online to ensure a stable internet connection and provide instructions on using WebEx, the video conferencing platform used at our university. The SPs were provided with a written case summary two weeks prior to an online training session with the occupational therapy faculty and the STS. During this training, the faculty reviewed the schedule and sequence of events for simulation day. Faculty also provided case

coaching by engaging SPs in deeper discussions about each character's clinical presentation, personal context, and emotional characteristics. An exemplar video of a strong portrayal of the same case was also shared. Next, each SP participated in a rehearsal, which allowed the STS to give the SP feedback about production elements such as their attire, physical location/background, lighting, and camera angle. For example, the client who had a spinal cord injury was lying in bed. Finally, each SP rehearsed their assigned role with an occupational therapy faculty and received feedback about the accuracy of their portrayals. Each SP participated in approximately two hours of online training.

Per best practice for simulation-based learning (Rudolph et al., 2014), the faculty reviewed learning outcomes, expectations from the learners, and logistical details with the students during a class meeting prior to the simulations. Additionally, to prepare students for the online simulations, written guidelines of best practices for online simulations were provided. These guidelines addressed topics such as tips for optimizing the internet connection or troubleshooting common audio issues.

Implementation

In May 2020, we implemented 21 SP encounters across three days. On each day, two concurrent online simulation "rooms," each with its own SP and production staff (STS and occupational therapy faculty), were implementing the same case scenario. Each encounter lasted approximately 30 minutes and included two active learners and two to six observing learners. The sequence of events for each encounter is provided in Table 1.

Table 1

Sequence of Events During Each Simulation Encounter

Activity	Time Allotted
Brief orientation	2 minutes
SP encounter	15 minutes
Emotional debrief	3-5 minutes
SP feedback	5-7 minutes

As students signed on to the WebEx meeting, the occupational therapy instructor greeted each student; this greeting served as a technology check to ensure that each student's audio and video were functioning. The instructor then reminded students of the upcoming sequence of events (SP encounter, emotional debrief, and SP feedback) and re-established a safe learning space, as the active learners were invariably nervous. Next the STS reminded students of best practices for technology such as muting their microphone when not speaking and choosing viewing options. The active learners kept their videos on while everyone else's video was turned off. The STS then displayed a photo of a hospital room and reminded active learners to proceed as though they were interacting with the client in this hospital room. Finally, the SP, who had been waiting in a virtual waiting room so that they could get into character, was brought into the meeting.

Each encounter began with the SP saying, “who are you.” The SP occasionally made references to being in the hospital throughout the simulation to help orient the learners. During the encounter, the occupational therapy instructor could either private chat or text message the SP if any prompting was indicated. The occupational therapy instructor provided a verbal announcement when there were two minutes remaining and a final prompt to end the encounter at approximately 15 minutes.

Immediately after the encounter ended, the SP was moved into an online waiting room away from the main meeting to give the students a more comfortable space for an emotional debrief. Each active learner was invited to talk about their emotional experience during the simulation, followed by observing learners sharing their emotional responses. Finally, the SP returned to the meeting to give feedback to the students and answer their questions.

At the end of each simulation day, the faculty members, simulation educator, STSs, and SPs participated in a team huddle. This time was used to identify any concerns and potential changes to improve the simulation process. The following week, during the regular class meeting after the simulations, an extensive debriefing using video recordings of the SP encounters was completed.

Reflections and Feedback

Since the online SP encounters were a new teaching tool, soliciting feedback from all stakeholders was a priority in order to validate and improve the continued use of this tool. Besides the immediate comments and suggestions collected during the post-simulation team huddle, additional feedback and reflections were sought at a later time from the occupational therapy faculty, a simulation educator, simulation technology specialists, and SPs who had participated in the online simulations. Another important component of feedback was to gather perceptions from the student learners about their online simulation experience. This paper focuses on reporting findings from the student feedback process.

Method

Participants

The convenience sample of simulation participants were 42 occupational therapy students who had completed two-semester of didactic coursework. Seven of the students were pursuing an entry-level Master of Occupational Therapy (MOT) degree and 35 were pursuing an entry-level Doctor of Occupational Therapy (OTD) degree. Prior to the pandemic shutdown, each student had participated in an in-person SP encounter of a summative competency of upper extremity goniometry. At the start of the shutdown, this cohort had participated as either active or observing learners in an online interprofessional SP simulation.

Data Collection

Student perceptions were collected and examined using a mixed-methods design of survey questionnaire and one-on-one interview.

Student Feedback Survey

Students completed an anonymous online survey to gather information about their experience with the adapted simulation. Online surveys have been established as a flexible, useful tool for assessing a diverse range of topics in education (Roberts & Allen, 2015). Students often prefer online surveys (Roberts & Allen, 2015), likely due to its convenience and anonymity (Evans & Mathur, 2018). The survey development process delineated by Portney and Watkins (2015) was used. Respective frameworks from Hontvedt and Øvergård (2020) and Hamstra et al. (2014) informed the survey's guiding questions. The questions addressed learner engagement, psychological fidelity, and accomplishment of the simulation's learning outcomes. The survey included six Likert scale items and one open-ended, text entry question. Surveys that incorporate both Likert scale and open-ended questions are noted to be effective in allowing educators to easily gauge whole group responses while also providing students "with the opportunity to elaborate and create an accurate snapshot of their feedback experience" (Mandouit, 2018, p. 760).

A draft of the survey was reviewed by two simulation educators and an occupational therapy faculty member and piloted with two occupational therapy students from a different cohort. After edits were made in response to faculty and student feedback, the final version of this survey was administered anonymously using a university subscribed online survey software: Qualtrics. The students were emailed the survey within 24 hours of their participation as an active learner. To ensure trustworthiness of data, the students were informed that survey responses would be anonymous and thus had no bearing on their course grade. To encourage their voluntary completion of the survey, students were told that their input would be used for continuous improvement of the course and students' learning experience. The survey remained open for seven days, and a reminder was sent on the fifth day.

Interviews

Student interviews were conducted to gain a deeper understanding of learner experiences. The interviews were conducted using a semi-structured format, guided by Kallio et al.'s (2016) framework. Main themes addressed in the interviews included: overall experience as a participant in the simulations, challenges encountered, and how the online simulation experience could be improved. A draft of the interview guide was reviewed by a simulation educator.

Ten students from this cohort of simulation participants were randomly selected using the online application Random Name Picker (<https://namepicker.net>) and sent an email invitation for a private online interview. Five students accepted the invitation. To help ensure trustworthiness of data, at the start of each interview the students were informed that the interview purpose was to better understand the student experience for curriculum improvement; interviewees were assured their responses would remain confidential. Moreover, the interviewer was not the interviewees' instructor of record at

the time of interview. All five students gave permission for the interview to be recorded. Four OTD students and one MOT student were interviewed. The interviews were completed within three weeks of the simulations. The duration of the interviews ranged from 15 to 27 minutes.

Data Analysis

Quantitative survey data were analyzed using descriptive statistics. Frequency count was used to analyze the survey's text data.

Interviews were transcribed verbatim for analysis. Transcripts were provided to the interviewees for review and corrections to increase trustworthiness; no corrections were requested. Data were analyzed using qualitative content analysis. Commonly used in the health professions, qualitative content analysis is suitable for a variety of text data (Lindgren et al., 2020). Since the current study was an initial exploration of an innovative topic, conventional content analysis was chosen as an appropriate method for identifying trends and patterns in the students' responses (Colorafi & Evans, 2016; Graneheim et al., 2017). Qualitative content analysis can capture manifest content, resulting in *categories*, as well as latent content, leading to *themes* (Lindgren et al., 2020).

The two authors independently coded the interview transcripts. Both authors were occupational therapy faculty members who had experience with coding and thematic analysis. During coding, the authors used an inductive, data driven approach of searching for patterns in the data (Graneheim et al., 2017). The text data were organized into meaning units that were further abstracted into codes. The codes were then sorted into emerging categories and/or themes. After independent coding was completed, the authors met to discuss discrepancies with coding and establish agreement on the categories and themes.

The authors applied the guidelines established by Lindgren and colleagues (2020) for strengthening the trustworthiness of qualitative content analysis. These guidelines included: (a) retain the entire text until coding is complete and report any excluded data, (b) stay close to the words in the original text when coding, (c) keep the codes on the same level of abstraction and interpretation, and (d) ensure that the names of categories and themes address the purpose of the study and include the underlying message uniting all subcategories and sub-themes (Lindgren et al., 2020).

This study was approved by the university's Institutional Review Board.

Results

Student Feedback Survey

The response rate was 86%, with 36 responses received from the 42-student cohort.

Responses for the Likert Scale Items

Table 2 summarizes the descriptive statistics for the Likert scale items.

Table 2

Student Feedback Survey Results

Survey Item	Frequency of Responses			
	Strongly Agree	Agree	Disagree	Strongly Disagree
The simulation kept me engaged	27 (75%)	9 (25%)	0	0
The simulation provided an effective way to practice applying the Occupational Therapy Practice Framework, critical and clinical reasoning, relevant theories, and best evidence to a specific clinical scenario.*	18 (50%)	18 (50%)	0	0
The simulation provided an effective way to practice identifying a client's occupational profile through an interview.*	14 (39%)	19 (53%)	3 (8%)	0
The simulation provided an effective way to practice establishing a therapeutic relationship/rapport with a client through therapeutic use of self.*	22 (61%)	14 (39%)	0	0
During the simulation, I experienced emotions similar to what I would in real life.	18 (50%)	16 (44%)	2 (6%)	0
During the simulation, I used interpersonal communication and problem solving skills similar to what I would in real life.	13 (37%)	21 (60%)	1 (3%)	0

Note. * Survey item reflects one of the module's learning outcomes.

All respondents reported that the simulation kept them engaged and that the simulation was an effective way for addressing two of the three learning outcomes (indicated in Table 2 by *). The majority of respondents experienced emotions and applied interpersonal and problem solving skills similar to real life.

Text Entry Responses

When asked for additional comments or suggestions regarding the online format used for this simulation, a total of 14 responses were received. The length of responses ranged from one to five sentences. Seven of the respondents reported that the online simulations went well and expressed gratitude for the opportunity. Four responses addressed technology challenges: two respondents reported unstable internet connections and two reported difficulty choosing the correct viewing option. Two students requested more prep time immediately before the simulation started. Two

comments addressed the SPs. One student felt “the actors created scenarios that didn’t help the student’s learning but distracted and made them nervous.” In contrast, another wrote, “the actress was entirely convincing, so my reactions were as if I were with an actual client.”

Student Feedback Interviews

The interviewees included one male and four female students. The qualitative content analysis yielded five themes: a stepping stone for learning, realism of the experience, physical fidelity, limitations of being online, and curriculum design and implementation.

A Stepping Stone for Learning

The first emerging theme was that the online simulations may have provided a stepping stone in the students’ learning process. Three categories surfaced within this theme.

Emotional Engagement. All five students found the simulations to be engaging and discussed their emotional responses. Overall, they found the simulations to be a positive but somewhat intimidating experience which they appreciated. One student stated, “For its intended purpose, I think it was great. It was valuable. I am glad we did it. It was scary, but it was a good learning experience.” Another student reported, “the entire experience is very pleasant. The simulation was fun. I was nervous, of course, to interview someone and not know how their reaction would be. But at the same time, I’m glad that I did that.”

Less Nervous Being Online. Three students reported that being online may have reduced the intensity of the nervousness they felt. A student explained, “because you are seeing somebody on the screen, I feel less nervous. If a patient on the screen is angry at you, you feel less intense on the screen. But when you are there in person, it’s more emotional.” Another student reported feeling less self-conscious. She stated, “I feel like I’m less nervous when I’m doing it virtually. I’m just looking at the screen and not feeling like a lot of people are looking at me. The virtual experience really eases off a lot of that kind of anxiety you feel while you’re present physically with that patient.”

One student reflected that the online encounter was a less intimidating context for her and may have been a good introduction to simulations. The student stated,

The online simulations were kind of a good leeway... I was in the comfort of my own home, versus if we’re in-person in a simulated hospital setting. Being really our first time as active learners, I actually didn’t mind being at home. And I now feel more comfortable if we were to go into the simulation labs. All right, this is what the process is. This is what is going to get thrown at you.

A Narrower Scope of Focus. Two students felt the online format narrowed their focus to the client on the screen, which may have made the task of interacting with the client easier for them. However, both recognized they would eventually need to learn how to interact with clients in various contexts. A student explained, “There are pluses and minuses to being online. I can focus on the patient’s emotions and face and not get distracted by other things. But, distractions are important for us to know and we need to

consider them.” Another student speculated there would have been “a lot to take in” if the simulation were in-person in a simulated hospital environment. She recognized she would eventually need to be able to work with clients in a hospital environment but felt that the online encounters provided a good lead-in to a more challenging environment.

Realism of the Experience

Students discussed the realism of the online encounters, and three categories emerged: skilled actors, emotional authenticity, and comparability to an in-person experience.

Skilled Actors. Three students spontaneously commented on how well the actors portrayed their roles and that the actor’s skills made the online encounter feel realistic. One student noted, “the actors were spot on.” Another student explained, “he was a very good actor. So that helped a lot with simulating a real patient.”

Emotional Authenticity. The students reported feeling real emotions that they would expect to feel during an actual client encounter. For example, three students reported feeling nervous and intimidated as they would expect to feel with an actual client. One student explained, “I feel like the online simulation still captured the emotions that I would have felt if it was in person. So I did feel in the moment and connected with the client.”

Comparability to an In-Person Experience. Several students felt their online experience seemed comparable to what would have occurred in person. A student said, “everyone was able to jump in and speak as if we *were* in person...I think it's about the same--remote or in person.” Another student explained,
I honestly didn't feel like there was that much of a difference being online. Other than the fact that you're not there with the person...I was still able to talk to the client how I wanted to, interact how I wanted to.

Physical Fidelity

When asked about the simulated setting, some felt the specific setting was not an area of focus for them while others provided suggestions for enhancing the online visual realism.

Peripherality of the Simulated Setting. Three students reported that their primary focus during the simulation was on the interactions with the client; the clinical context being simulated (a hospital room) was not a major consideration for them. A student explained, “I don't think my mind, honestly, even went there...I was not thinking that we're in the hospital at the time. I was just trying to talk to the patient.” Another student stated,

I know that we were presented with a picture before the simulation about the setting that we are supposed to be in. That was great because that gave us some information about the setting. During the simulation, I actually forgot that we're in the acute setting.

Enhancing the Online Visual Realism. When asked how the online simulation experience could be improved, two students offered suggestions to make it look more like the SP was actually in a hospital room. For example, the SP could be dressed in a hospital gown and wear an identification bracelet. The use of a virtual background or hanging a white sheet in the background was also suggested.

Limitation of Being Online

Students did experience limitations of being online. These limitations included: interruptions in communication due to technology, missing nonverbal and contextual cues, and physical limitations.

Interruptions in Communication Due to Technology. Students talked about difficulty hearing the SP during the simulation due to unstable internet connections or due to background noise from someone who forgot to mute their microphone. A student explained, “My biggest issue with the online format was Internet connection issues. When people didn’t have strong internet, you couldn’t hear them. That can be really frustrating.” Another student encountered challenges due to not knowing how to choose the best WebEx viewing option and suggested doing a more extensive technology check prior to the simulations. She reported,

It was hard for me to switch to the thumbnail mode. I was able to see the patient, but they were at the bottom of the screen in a little box. So it's hard to maintain eye contact and it was hard to see. Maybe having the IT tech check with each participant about their settings before we begin would be helpful.

Missing Nonverbal and Contextual Cues. Students reported it was difficult to get a full picture of the client’s current state when nonverbal and contextual cues were not fully accessible. For example, one student stated, “I was just seeing the patient lying on the bed. So what's going on around him? Any other distractions for his attention?”

Another student explained,

It was hard to read the person's energy and play off of how they were feeling. Because I felt so disconnected from them, not being in the same room. It was really hard to match their energy when the camera switched from who's talking. You're trying to read their emotional expressions, but then their image keeps shifting.

Physical Limitations. Two students mentioned that they felt limited because they could not physically interact with the client while interviewing them. A student explained,

I cannot move the table in front of the patient. I cannot give the patient the water to drink or say ‘Can I get you anything else?’ I would have liked options to move around the patient, like go to the patient's left side or the right side...change positions to ease the client a little bit.

Simulation Design and Implementation

Three categories emerged under the theme of simulation design and implementation.

Clarity of Instructions. Two students noted that the instructions they received regarding the simulations were very clear. A student explained, “the overall instructions are very clear. Like where do we go to have the experience, when are we going to have the observer or the active learner experience.” Another student compared the instructions received for the current simulations versus those received for a previous online simulation experience. She stated,

I had a harder time with the interprofessional education simulation because it was not as clear what we were doing. I would have asked for more clear instructions about what the goal was. But this one I feel like I got all the information I needed.

Working with a Partner. All five students indicated that they appreciated working with a partner during the SP encounter and that being remote did not significantly impede their ability to collaborate with their partner. A student noted, I think we did a good job of filling in the gaps for each other. Like if I got stuck, she stepped in. If she got stuck, I tried to jump in. That was nice, not feeling like I was out there all by myself. Even in the remote format, I would have been much more freaked out if I was all by myself.

Another student talked about the ease of connecting with her partner to prepare for the simulation. She stated, “While I would have loved to be in person, it wasn’t any issue to just FaceTime and connect with each other. We were definitely able to do our collaboration.” A third student noted that having a partner was especially appreciated since simulations are a relative new experience for them. She explained,

We don’t have a lot of exposure to interviewing patients. So I’m really glad that we did that in pairs and tackled it as a team. It really eased off our anxiety also. And in terms of working together virtually, I feel like this is not a problem for us because we have been learning online for awhile already.

Immediate Feedback. Two students reported that receiving feedback immediately following the simulation encounter was beneficial for their learning. One of the students felt this immediate feedback was particularly welcome during remote learning. She explained,

I enjoyed the part afterwards when the actors would come back and give their feedback. That was really helpful for me and probably the biggest reward out of all of this...In the online format, you have to wait for feedback in so many classes. There’s a big lag in time. Versus when you’re in the classroom, you can talk to the teacher, you can ask them what they think. So to get that direct feedback (from the actors) was reassuring. It gave you that feeling of being in the classroom again.

Another student commented,

I think the debrief part is as important as the actual simulation where we can just let our emotions out right after the simulation and have the opportunity to really reflect on what we did immediately. It was very helpful for me that I can learn from the experience immediately.

Discussion

Overall student responses to the online SP encounters were positive. Similar to reported perceptions of occupational therapy students regarding in-person simulations (Bennett et al., 2017; Wu & Shea, 2020), student participants in the current study found the online SP encounters to be engaging and realistic. Similar to Dadswell et al.'s (2021) recent findings, students in the current study experienced realism in terms of emotions as well as the interpersonal and cognitive skills used, thus affirming the psychological and functional fidelity of the simulations (Hamstra et al., 2014). It was notable that the perceived realism came mostly from the actors' ability to portray the client. Physical realism, including the environment where the encounter was supposedly happening, did not seem to be a primary consideration during the encounters. These findings suggest that online SP encounters simulating a physical clinical setting (such as a hospital) may be particularly appropriate when the learning outcomes focus on interpersonal interactions rather than physical interactions or manipulation of the client's physical environment.

The students reported that the online simulations were an effective way to address the intended learning outcomes. The feedback results suggest that the online format could be an effective way to meet a simulation's learning outcomes, particularly if critical consideration during the planning phase determines that functional fidelity pertaining to "clinical task demands" can be maintained online (Hamstra et al., 2014, p. 388). For example, in the current learning module, the learners' primary task demands were to interact verbally with a client without any specific demands for physical interactions, making it feasible to carry out the required clinical tasks online. Clinical tasks such as history taking, clinical reasoning, and professional communication have been suggested as skills that can be taught to students using online simulated patients or role plays (Mukhtar et al., 2020).

The students expressed appreciation for the clarity of instructions provided for the online SP encounters. Clarity of instructions has been identified as a best practice for creating a learner-centered approach to adult online education (Blondy, 2007). Clear instructions may have been particularly appreciated and important during a learning situation that is known to invoke learner anxiety such as a simulation (Shearer, 2016).

Although the online simulations in this current study came about due to the unavailability of in-person simulations during a pandemic, an emerging theme from the student interviews raises the question whether online simulations have a place in occupational therapy education even in non-pandemic times. The online context may have created a stepping stone for the students' learning by reducing the scope of focus and decreasing their level of nervousness and anxiety. Student anxiety during simulation is well-established and has been studied extensively, particularly in nursing education (Martín-Rodríguez et al., 2021; Nielsen & Harder, 2013; Parker & Welch, 2021; Shearer, 2016; Stein, 2020; Wheeler et al., 2021; Yockey & Henry, 2019). Although the elevated stress and anxiety experienced by learners during simulation has been implicated as one of the reasons for its effectiveness (Bong et al., 2010; DeMaria et al., 2010), excessive anxiety may be detrimental to student learning (Nielsen &

Harder, 2013; Stein, 2020; Yockey & Henry, 2019). The range of stress that optimizes learning during simulation has been studied but not yet determined (Nielsen & Harder, 2013; Stein, 2020). Recent literature has proposed strategies for mitigating student anxiety during simulations such as mindfulness (Wheeler et al., 2021) or gaming (Parker & Welch, 2021). Incorporating an online simulation as an introduction to simulation-based learning could be another strategy to reduce anxiety and prepare students for future in-person simulations, as an online encounter could be a graded way to familiarize students with the simulation process.

Another potential application of online SP simulations pertains to telehealth. Since telehealth occurs online, online simulations with a SP would be a contextually valid learning tool for developing students' telehealth practice skills. Telehealth is an established service delivery method within occupational therapy practice that is expected to become even more prevalent in the future (Cason, 2014). The American Occupational Therapy Association (2018) has provided official guidelines for the provision of telehealth. There is strong support for telehealth as a permanent service delivery option within occupational therapy practice, particularly since the COVID-19 pandemic (Dahl-Popolizio et al., 2020; Hoel et al., 2021). Wynn (2020) asserted that as the healthcare industry continues to adapt to the provision of care via virtual platforms, training students to provide services via online encounters will become increasingly essential. The current Accreditation Council for Occupational Therapy Education Standards (2018) delineate technology expectations for practitioners, including knowledge of the use of virtual environments and telehealth. Given the current healthcare delivery trends and technology, it may be appropriate for occupational therapy education programs to provide hands-on learning opportunities for telehealth skills. Preliminary findings from this current study suggest that online SP encounters could be a potential tool for meeting telehealth learning needs in occupational therapy education.

Current findings identified several limitations of online SP encounters including: technology barriers, missing nonverbal and contextual communication cues, and lack of physical interactions. It is notable that these same barriers have been reported by students worldwide with regard to online learning in general during COVID-19 (Basuony et al., 2021; Farsi et al., 2021; Mukhtar et al., 2020; Xhelili et al., 2021; Zgheib et al., 2021). Students have perceived that technology and infrastructure issues as well as the lack of in-person interactions with instructors and peers have impeded their learning process. However, there was one notable difference. While students worldwide have broadly reported not feeling motivated, interested, or engaged when learning online during the pandemic (Basuony et al., 2021; Zgheib et al., 2021), the current findings suggest a high level of interest and engagement by the students during a specific learning modality of online SP encounters. Although some universal barriers of online learning (such as technology glitches or lack of in-person interactions) are inevitable, online SP encounters may be a learning tool that can be used to increase student interest and engagement in the learning process.

The authors were surprised to learn that some students had difficulty navigating the technology, such as choosing a viewing option. Reflecting on this, we realized that we had made an assumption that our students, who were mostly millennials, were tech savvy and would easily navigate the WebEx platform. Thus, less synchronous class time was spent orienting students to specific technology functions on WebEx. Emerging evidence suggests that millennials may not be as tech savvy as the general public assumes they are (Combes, 2012; Narasuman et al., 2011).

Limitations

The results from this study should be interpreted with caution, since the data were only collected from one cohort of students at one university about one learning module. The findings may not generalize to other occupational therapy students at other education programs. Additionally, only student perceptions about the learning outcomes have been collected; objective measures of learning outcomes are lacking.

Although the response rate for the feedback survey was high at 86%, the interview acceptance rate was only 50%. Non-response bias may have affected the interview results. Moreover, although the interviewer was not a faculty of record at the time of the student interviews, the person is nonetheless a faculty member. Perhaps the interviewer's role at the university still affected how freely the students spoke during the interviews.

Directions for Future Studies

The current study only includes student responses. Feedback was also collected from the occupational therapy faculty, the simulation educator, the simulation technology specialists, and the SPs who had participated in these online simulations. The additional feedback data could also be analyzed and considered with the current findings to inform the continuous improvement of online SP simulations.

Online SP encounters are continuing with other cohorts of occupational therapy students and with students in other healthcare programs at our university. Collecting feedback from additional cohorts of learners or from different professions could provide a broader perspective about how to enhance the student experience during online simulations.

Implications for Occupational Therapy Education

Online SP simulations are a promising innovation in occupational therapy education. The following suggestions are offered to occupational therapy educators:

- An online SP simulation has multiple potential applications in occupational therapy education: (a) An engaging active learning tool for online learning, (b) An authentic method to teach telehealth skills, and (c) A stepping stone to prepare students for future in-person SP simulations.
- During the conceptualization phase, the learning outcomes and clinical task demands should be carefully examined to assure that they can be feasibly accomplished in an online format.

- It is important to allow extra time for planning, preparation, and provide clear instructions to the student learners.
- To ensure quality and effectiveness, it is important to collect feedback from students when implementing a new teaching-learning tool such as online SP simulations. The authors have gained valuable insights from the student feedback process.

Conclusion

The need to pivot to online learning during a pandemic led to the innovation of online SP simulations for occupational therapy students. Not only did the online SP simulations effectively meet the pre-established learning outcomes of a course module, but they also emerged as a viable routine learning tool to enhance student learning, particularly in the area of telehealth. Online SP simulations may also be strategically used as a first simulation experience for students, buffering some of the initial fears and discomforts associated with participation in simulations. As technological advancements are ongoing and distance learning may become an inevitable part of occupational therapy education, online simulation experiences with SPs will likely continue to develop and warrant further investigations.

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