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Homemade virtual clinical: A low-cost, high-impact solution for clinical

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ARTICLE INFO

Article History:
Accepted 21 February 2021

Keywords:
Education
Nursing
Virtual simulation
Clinical decision making
Observer role

ABSTRACT

Background: The COVID-19 pandemic highlighted the need for quality nurses and nursing education. Virtual simulation emerged as a key component of providing clinical experiences to nursing students.

Problem: Commercial virtual simulation products can be costly, and it is difficult to ensure the content meets student needs. In addition, there is a potential for cheating as answers are available online.

Methods: Faculty recorded 16 different scenarios in pre-determined segments, including patient report, assessment, provider communication, and conclusion. During the clinical experience, the students watched the videos and participated in faculty-led discussion. At the conclusion of the activity, students completed a reflection assignment providing qualitative data for review.

Results: Student feedback was positive. Themes identified in the comments include critical thinking, variety of scenarios, observer role, debriefing, and overall quality of experience.

Conclusions: Homemade virtual clinical has the potential to be a low-cost, high-impact method for virtual simulation across nursing curricula. Further research is needed.

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Introduction

The COVID-19 pandemic has not only affected nurses in the clinical setting. Nurse educators are in an unprecedented situation as well. The first challenge is to adequately prepare nurses to be able to adapt to and perform in to such a crisis. That challenge is not new; developing high quality nurses that can respond to the dynamic needs of healthcare has always been the focus of nursing education. The obstacle that arose during the pandemic was (and continues to be) preparing nurses *during* the pandemic. The pandemic has limited in-person instruction and clinical experiences making nursing education even more difficult at a time when the need for high-quality nurses has never been more apparent.

Background

Research supports the use of simulation as an effective alternative to traditional clinical experiences because it helps students to build clinical judgement and decision-making skills (Herron et al., 2019; Johnson, 2020). Simulation provides students with the opportunity to make mistakes and participate in situations that would not be safe in the clinical setting (Ironside, 2014; Reime et al., 2016). As a result of COVID-19, even simulation opportunities were limited as universities closed campuses and students were given stay-at-home orders. Consequently, virtual simulation moved to the forefront of nursing education.

Description of problem

Faculty at a small, midwestern university were faced with challenges as a move to virtual simulation was made in response to COVID-19. Those faculty teaching second-semester medical-surgical content had specific concerns in three primary areas. First, was cost. The virtual simulation programs reviewed were quite expensive. This was a major deterrent, particularly in light of the economic challenges faced by universities because of COVID-19. State-funded universities faced fiscal challenges as state tax revenue declined (Clemens & Veuger, 2020) and enrollment declines were anticipated in both public and private universities (Friga, 2020). Another obstacle was content. While the commercial programs have many options, no single program consistently had appropriate scenarios to meet all course objectives. The scenarios provided within the virtual simulation programs were either too broad, too focused, or simply did not address a specific need the faculty had identified. In addition, faculty faced a dilemma on how to assign the scenarios. The number of available scenarios made it difficult to become familiar with all of them in order to offer proper guidance and feedback to students. Finally, faculty recognized that many commercial products had the potential for cheating as the answers to the cases are often available online. In order to overcome these challenges, faculty recorded simulation for use in the virtual environment.

Literature review

Few studies regarding the use of recorded scenarios for simulations were located during a review of literature. Herron (2019)

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compared the learning outcomes of recorded case studies to recorded scenarios and found the video component increased learning. [Jimeñez-Rodríguez et al. \(2020\)](#) conducted an activity using video simulation. In this study, researchers evaluated the use of video conferencing technology to interact with standardized patients. The students in that study reported overall satisfaction. The researchers identified the use of video modalities as an important consideration for nursing simulation, particularly in times when in-person simulation is not recommended. Finally, [Stanley et al. \(2018\)](#) conducted a project using recorded simulation in online courses. The activity focused on aligning course objectives using recorded scenarios and VoiceThread technology. The researchers concluded that students were engaged during the activity and met learning objectives. While no studies using the same or very similar methods described for this activity were found, there are a few studies that demonstrate success with various components of the activity.

Theoretical framework

The NLN Jeffries Simulation Theory was used as the framework for the development of this activity. First, learning objectives of the activity were identified. Then, scenarios were chosen to facilitate meeting those objectives. Proper planning goes beyond only content; it includes the appropriate complexity of the simulation, fidelity, equipment, and personnel ([Jeffries et al., 2015](#)). Central to the activity – and the NLN Jeffries Simulation Theory – is the interaction between the facilitator and student. The facilitator must be able to adjust to the changing needs of the students throughout the scenario ([Fey & Kardong-Edgren, 2017](#); [Jeffries et al., 2015](#)). All of these concepts were key in the planning of this activity.

While traditional simulation planning and development helped to design the activity, the implementation was not traditional. Faculty had reason to believe this activity had merit because this method of doing virtual simulation is essentially using the observer role in a less traditional manner. The observer role has been established as a valuable component of simulation experiences ([Hober & Bonnel, 2014](#)). Students often report learning as much or even more from the observer role ([Norman, 2018](#)). Rather than observing other students, the faculty (or another actor) was observed.

Methods

The move to virtual clinical was abrupt and did not allow for planning to collect data for a formal research study. The methods outlined below describe the process of planning and implementing the activity. The activity described was conducted at a small Midwestern university Bachelor of Science nursing program with second semester nursing students, where the focus of the didactic courses is medical-surgical content. A total of 31 students enrolled in the course participated in this activity.

Planning

Simulations that have been used previously for student participation were selected for this experience. This group of scenarios was chosen because they highlight conditions that are not often seen in clinical settings and are consistent with the learning objectives for the course. This aligns with the International Nursing Association for Clinical Simulation and Learning (INACSL) Standards of Best Practice for simulation design ([INACSL Standards Committee, 2016a](#)).

High-fidelity simulators were used for this activity. Two faculty members and the simulation lab coordinator collaborated to make this project possible. One person was the nurse, one ran recording equipment, and one controlled the 3G manikin. The person in charge of video recording also played the provider during phone calls from

the nurse, as it was possible for them to leave their post to accept the phone call.

Prebriefing

Prior to the virtual simulation experience, students were given the medical history, home medications, hospital medication orders and admission diagnosis. Students were also given information on how to complete an SBAR with a video demonstrating a proper call to a provider. Supplemental materials regarding simulation were reviewed in class and available online in the learning management system.

Scenarios

A total of 16 scenarios were recorded. The scenarios centered around a male patient who recently had ventral hernia repair. The client had a history of diabetes, hypertension, and a previous deep vein thrombosis. The cases evolved over a two to three-day post-operative period during which the client experienced opioid overdose, myocardial infarction, dehiscence, pulmonary embolism, hypoglycemia, and other complications.

Scenarios were recorded in segments that were three to eight minutes in length. First, the client report was recorded. Next, assessment was the focus. Then, provider contact was displayed. Finally, the scenario was concluded. These segments were designed to facilitate discussion and critical thinking during the clinical experience. This aligns with the INACSL Standards of Best Practice for Simulation Facilitation (2016b). A total of approximately six hours was spent recording this activity.

In some scenarios, the nurse (played by faculty) was an experienced nurse who was confident. In other scenarios, the nurse was new and less confident. During the scenarios, the nurse did many things correctly, but did occasionally make mistakes. Mistakes that students and new nurses make frequently were intentionally added, but the experienced nurse made mistakes too. Many of these mistakes centered on communication with the provider; other mistakes included the nurse not recognizing key assessment findings or misinterpreting an event. This allowed students to see what could go wrong and how to respond when something does. In addition, it reminded students that anyone can make a mistake, and the most important thing is to admit it and take the appropriate steps to correct it.

The clinical experience

For the virtual clinical, students participated via Zoom in their assigned clinical groups of eight to ten students. Students watched the scenarios with faculty present. Faculty was there to facilitate discussion and answer questions. In addition, faculty could present lab, X-ray, EKG, and other pertinent data.

This activity counted as eight hours of clinical credit for each student. While this was completed in one clinical day, faculty would recommend the activity be conducted in four-hour sessions in the future. Students participated in assigned clinical groups of seven to ten, meaning faculty repeated the process four times to accommodate all 31 students in the cohort. A total of approximately 30 min was spent on each of the 16 scenarios. Each scenario was presented in two to three segments, averaging five minutes each. This equaled approximately 15 min of video and 15 min of discussion per scenario. See [Table 1](#) for a general outline of the timeline for each scenario.

As students watched the scenarios, faculty guided discussion at the end of each segment (as described above). After the patient report segment, students were asked to consider the main concerns for the patient. *Based on the information provided, what focused assessments are most important? What complications are most likely? What are the signs and symptoms that would be key to identify?*

Table 1
General overview of scenario timeline.

Topic	Video time	Discussion points	Discussion time
Patient report	1–2 min	<ul style="list-style-type: none"> →Based on the information provided, what focused assessments are most important? →What complications are most likely? 	2–3 min
Initial assessment	3 min	<ul style="list-style-type: none"> →What are the signs and symptoms that would be key to identify? →What are the signs and symptoms that would be key to identify? →Was there anything that could be significant? 	2–3 min
Notifying provider/interventions	8 min	<ul style="list-style-type: none"> →Were there any additional assessments or other data that would help guide care of this patient? →What can the nurse do to help get the most out of contacting the provider? →What information and/or assessments should be done prior to contacting a provider? 	3–5 min
Conclusion	NA	<ul style="list-style-type: none"> →What happens when a nurse has a negative experience? →Would they have identified the complication? →How would their assessment have differed? →How would their own interaction with the provider have gone – would they have called sooner, later, at all? 	5–7 min

After the assessment segment, students were asked to identify those findings that are of most concern. *Was there anything that could be significant? Were there any additional assessments or other data that would help guide care of this patient?*

The next segment, provider communication, proved to be a very key part of the learning experience. This was an area that faculty felt could be highlighted more liberally with the faculty nurse than can be done with students in traditional simulation. When students are in the nurse role, their psychological safety and security is of the utmost importance (Johnson, 2020). Because we were using staff who knew how the interaction would transpire, faculty felt comfortable the interactions could be a little more tense than usual.

A variety of providers were contacted throughout the scenarios; some were positive interactions and some were not. The faculty facilitator was able to discuss that while provider interaction is not always difficult or unpleasant, it can happen. Discussion centered on the nurse's role in these interactions. *What can the nurse do to help get the most out of contacting the provider? What information and/or assessments should be done prior to contacting a provider? What happens when a nurse has a negative experience?*

Finally, the scenario was completed. A full debriefing took place at this time. Students were asked to consider how they would have responded if they were the nurse. *Would they have identified the complication? How would their assessment have differed? How would their own interaction with the provider have gone – would they have called sooner, later, at all?*

Facilitation, including debriefing, of the simulation experience was critical. The INACSL Standards of Best Practice for Simulation Facilitation (2016b) outline the importance of a properly trained facilitator (INACSL Standards Committee (2016b) and Johnson (2020)). In addition, the simulation must be appropriate for the audience and proper prebriefing activities must be provided. Finally, proper facilitation includes guided learning to achieve the identified outcomes.

Students actively participated in guided discussion throughout the scenarios.

Study of the interventions

Following the simulation experience, the students were assigned a reflection assignment that asked them to identify what they learned, what went well, and what could have been improved in the virtual simulation experience. This feedback was imperative to assess learning as this was the first-time simulation were completed in this manner.

A total of 31 students participated in the virtual clinical experience. A post-activity reflection was assigned at the conclusion of the activity. Upon review of that assignment, faculty recognized the

potential value of the activity and completed an analysis of the data in order to share results with others.

Analysis included reviewing the comments for themes using an inductive approach. This approach allows researchers to identify themes within qualitative data (Thomas, 2016). To accomplish this, student comments were put into a spreadsheet and reviewed by the researchers to identify themes. The data was then coded according to those themes based on keywords.

Results

After review as previously described, the following themes were identified: critical thinking, variety of scenarios, observer role, debriefing, and overall quality of experience. Aggregate qualitative data following the review process are shared below categorized via themes identified.

Critical thinking

Three of the 27 comments specifically use the term “critical thinking.” There were 14 other statements that indirectly refer to critical thinking. Multiple comments refer to “connecting” assessment data with the patient problem. Others mention realizing the importance of a comprehensive assessment and good communication with the provider. Students also commented that being in the observer role allowed them to think critically about the scenario.

Variety of scenarios

One of the more surprising themes was the repeated mention of the number and variety of scenarios that were completed. In previous semesters, the students would have participated in one scenario and watched three others. Due to the clinical time that had to be made up, students watched 16 scenarios. Many students commented on how helpful this was to them. A total of 12 students mention the number and variety of scenarios was beneficial to them.

While some students commented on the number of scenarios, others focused on the variety of interactions – both positive and negative. Students commented that the diverse interactions with the patient and provider allowed them to think more about what to do when things do not go as planned. Many commented specifically on the tense interactions with providers as this is something they have not experienced but have heard about. In addition to the comments on the scenarios that illustrate poor care or communication, there was discussion regarding the scenarios that went well. Students stated they appreciated seeing both types of interactions to compare and contrast the two.

Observer role

Several remarks from students reinforce the learning opportunities that can come from observation. Nine students commented about observing the simulations and how that helped their learning. This was supported by performance in the didactic class assessments related to the conditions covered during the simulation, although further research is needed to prove causation. Several mentioned that watching the scenarios with faculty facilitation was very helpful. Students reported if they were unable to make connections by themselves, the faculty helped guide them. To accomplish this, faculty asked pointed questions and encouraged peers to discuss their observations and understanding.

Debriefing

As has been established repeatedly in literature regarding simulation, debriefing proved to be critical in this virtual experience as well. In accordance with [INACSL Standards Committee \(2016c\)](#), debriefing was completed by trained faculty dedicated to guiding the discussion towards learning outcomes in a safe manner. In total, 12 students commented specifically on the discussion. This feedback included comments on the debriefing throughout the scenarios, rather than just at the conclusion. The students appreciated being asked what they thought was happening throughout the scenarios, as it challenged them to make connections.

Overall quality

The feedback was overwhelmingly positive. A few students stated they wished they had the opportunity to participate in person, but felt this activity was an excellent alternative. Nearly all (26 of 27) comments alluded to the overall quality of the experience. Some feedback specifically mentioned this activity as a “good alternative” to in-person simulation, while others reflected on the overall learning experience.

Discussion

There is a critical need to continue to prepare nursing students for the complex world of healthcare. While healthcare professionals are learning more about the current pandemic, there are no guarantees when another could happen. In order to provide seamless quality nursing education, nurse educators must constantly expand their teaching “toolbox.”

This activity shows potential to become a significant tool in nursing education. The initial goal of the activity was to offer an acceptable alternative to both hospital-based clinical that was cost-effective and met the needs of the students. These goals were met without requiring unreasonable time and effort for faculty.

Faculty and staff were able to create the videos for the experience in an afternoon, or approximately six hours. While this may seem like a lot of time, it is less than one clinical day. The scenarios used were based on simulations developed for in-person clinical experiences, which likely contributed to the efficiency of the recording. Because a simulation laboratory was available, there was essentially no cost to the project. Overall, containing both cost and faculty time in the development of the activity contributed to a positive faculty experience.

Student comments suggest a positive student experience as well. Not only was it an enjoyable experience, but review of the qualitative review suggests it was beneficial for learning as well. The development of critical thinking is paramount in nursing education. Any activity that facilitates high-level thinking is beneficial. Emergence of

this theme within the data validates the potential for this activity in a variety of uses in education.

Key components that likely contributed to the success of the activity include the variety of scenarios and the faculty-led debriefing. Faculty were able to include interactions and experiences that would not be appropriate in either simulation or traditional clinical settings. One example of this is the demonstration of tense provider interactions. When students are performing as the nurse, faculty are mindful of psychological safety. By using faculty for these interactions, poor communication (by both the provider and the nurse) could be safely demonstrated. This allowed for robust discussion.

Debriefing was completed at the end of each segment and the end of each scenario. This method of debriefing proved to be very successful, and was the subject of many student comments. The discussion that take place throughout the scenarios helped students to make connections between what the patient was experiencing and the disease process. The debriefing at the end allowed for further reflection about other potential complications or outcomes for the patient.

Finally, the remarks regarding the overall quality of the virtual simulation experience are most suggestive of the success of this activity. Nearly 100% of participants made a reference to quality. Ultimately, this is the goal of all educational activities. While further research and development is necessary, the outcome of this limited review suggests it is worthy of the time and effort it would take to do so.

Limitations

There are many limitations to this review. First, a full study was not conducted due to the limitations of COVID-19, specifically the time needed to properly plan and implement a true research study. The faculty have reason to believe that learning occurred because of high-level critical thinking, no data was collected to support this. Future research measuring learning and critical thinking using this process would be beneficial. While there is evidence to support the use of various methods of virtual simulation, the use of recorded scenarios is not well-documented. Therefore, this activity was implemented without the benefit of a precedent. Although the data collected suggests recorded scenarios for virtual sim has benefits, it was a small sample at a single site. Further research is needed regarding the effectiveness of the use of recorded scenarios as virtual simulation.

Conclusions

While the activity was originally developed in response to COVID-19, there are other potential uses for this virtual clinical experience. First, the same recordings could be used for a variety of clinical and didactic outcomes ([Stanley et al., 2018](#)). For example, one group could examine the nursing care in terms of technical skill and identification of complications, but another group focuses on therapeutic communication. Portions of the videos could also be presented during classroom lecture as well. Again, different parts of the videos could be used for different lecture topics – from SBAR to therapeutic communication to disease processes – and could be utilized across the curriculum.

Ultimately, a library of recorded simulations could be developed for use within programs. These recordings can be used for whole clinical sections as described here, or could be used for make-up clinical in the event of illness or other absence. In addition, the focus can be adapted as described previously, making it possible to use the same recorded scenario across the curriculum.

While the COVID-19 pandemic was the catalyst for implementing “homemade” virtual simulation, the idea had been discussed for several semesters. Now that the process has been used successfully, faculty hope to expand on it in the future. Further research is needed as

this method has the potential to be a low-cost, high impact solution to the need for high-quality clinical experiences for nursing students.

Author note

We have no known conflict of interest to disclose.

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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