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Innovations in Simulation

Learning With Laughter: Implementing Engaging Virtual Simulation During the COVID-19 Pandemic

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KEYWORDS

Virtual simulation;
Remediation;
Nursing students;
Clinical judgement;
Humor

Abstract

Background: The COVID-19 pandemic has disrupted the methods used to develop clinical judgment in the simulation setting. In many cases, virtual simulation has replaced face-to-face simulation but lack of interaction between the students and educators is a limitation.

Sample: Ninety-six prelicensure baccalaureate nursing students at a Midwestern university participated in the end-of-semester simulation as part of the course.

Method: Based on the review of aggregate standardized test results, a simulation scenario was developed using a synchronous online format with educators portraying nurses and patients using a fun approach. At three predetermined stopping points, students discussed further nursing actions which were performed by the educators, followed by debriefing at the end of the scenario.

Results: Simulation evaluation as part of routine systematic simulation program assessment indicated students perceived both pauses for discussion during the scenario and debriefing at the end were valuable in promoting their learning.

Conclusion: This project is consistent with research which found virtual simulation enhances student learning and clinical judgment. The positive perception of students about the use of humor through implementation of the simulation scenario was consistent with current research related to student engagement and motivation to participate.

Cite this article:

Panepucci, S., Roe, E., Galbraith, A. & Thornton, T. (2022, Month). Learning With Laughter: Implementing Engaging Virtual Simulation During the COVID-19 Pandemic. *Clinical Simulation in Nursing*, 62, 92-98. <https://doi.org/10.1016/j.ecns.2021.08.022>.

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Background

Clinical judgment is viewed as an essential skill of all health care professionals and is important for the provision of quality nursing care. Nursing students must have both

requisite knowledge and skills to identify patient needs and implement appropriate nursing interventions. This includes the ability to notice and interpret assessment data, identify potential complications, respond, prioritize nursing care, and reflect (Tanner, 2006). Traditionally, facilitating the development of clinical judgment in nursing has been introduced in the classroom and practiced in the clinical

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setting with clinical instructor supervision. More recently, with difficulty obtaining clinical sites, using simulation to develop clinical judgment has replaced some hours previously spent in clinical. The NCSBN National Simulation Study provided evidence that substituting high-quality simulation, up to half of the traditional clinical hours, produces comparable end-of-program outcomes (Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014). However, the COVID-19 pandemic has forced many nursing programs to change to an online format so investigation of alternative strategies such as virtual simulation that do not require face-to-face interaction is needed.

The Healthcare Simulation Dictionary describes virtual simulation as involving use of computers and real people as a central role in operating simulated systems (Lopreiato, 2016). This definition is consistent with virtual simulation described in this article, in which students utilized decision-making and communication skills to provide care to simulated patients in a synchronous online environment.

A systematic review of virtual patient simulations in health care, included 51 trials and found virtual patient simulation showed similar results to traditional education for knowledge attainment, however for skills acquisition virtual patients was a more favorable approach when compared with traditional education (Kononowicz et al., 2019). In a study with 234 BSN student participants, researchers found virtual simulation improved self-perceived clinical judgment abilities (Fogg, Kubin, Wilson, & Trinka, 2020). Also, in a study with 166 nursing students participating in a virtual simulation, improvement was found in both knowledge and performance during patient deterioration (Borg, Sammuth, & Trapanib, 2018). Zu, Gou and Chen (2017) reported students who were randomly assigned to an experimental group utilizing virtual learning scored significantly higher in knowledge scores than those in the control group. A similar study by Padilha, Machado, Riberiro, Ranhos, & Costa (2019) found students assigned to case-based learning with a high-fidelity simulator made significant improvements in knowledge and satisfaction both immediately following the intervention and two months later when compared to the group using the same approach but with a low-fidelity simulation. Virtual simulation allows students to provide simulated care to patients in many settings, requires fewer resources, and is flexible. Alternatives to face-to-face simulation have been investigated, especially in the era of COVID-19. A modality using some virtual real-time contact with educators may be beneficial to learning. However, most of the research on virtual simulation involves students interacting with computer-generated patient scenarios and not engaging in real-time with educators (Kononowicz, et al., 2019).

Humor in both the classroom and online format can be an effective teaching modality to help engage students in learning. Researchers found humor integrated into the classroom can help students understand class content, im-

proving attention, motivation to participate in class, and improving the faculty-student relationship (Eskey, 2010; Shatz & Coil, 2008). Also, humor added to online course content increased student participation and online discussion (Anderson, 2011). The virtual simulation design of this project utilized humor as an approach to engage students in the online environment.

Simulation is an effective teaching pedagogy for nursing students, including the development of and enhancement of self-efficacy in clinical judgment (Camp & Legge, 2018). However, there is minimal research on simulation use for remediation of knowledge deficits specific to an entire group of students rather than individuals. In a review of literature on remediation in nursing students, authors concluded, remediation is effective if it is done with thoughtful planning and clear policies (Mee & Schreiner, 2016). Furthermore, group remediation has been found to be an effective strategy (English & Gordon, 2004). Therefore, a remediation strategy as described in this article, focusing on the needs of aggregates and using engaging simulation, may be efficient and beneficial.

Theoretical Framework

To provide safe, effective care, nurses must make sound clinical judgments. Tanner's (2006) *Clinical Judgment Model* explains how nurses think in clinical situations. The nurse's knowledge and background of the clinical situation and the nurse/patient relationship are key to the development of clinical judgment. The model also provides a framework for faculty to assist students by providing feedback and guidance to their critical thinking skills within simulation and clinical settings.

Tanner (2006) explains the overall process of the clinical judgment model in four phases. Phase one is to notice the situation, phase two is to understand or interpret the situation to be able to respond. The third phase is to respond with nursing actions and interventions related to the situation, and the final phase is reflecting-in-action to the client's responses to the nursing actions and reflecting-on-action to the overall outcomes of the clinical judgment, the strengths and weaknesses of the actions. For this project, a virtual simulation using live streaming was conducted, guided by Tanner's Clinical Judgment Model, as a method to develop clinical judgment (see Figure 1).

Materials and Methods

For several years, prior to the COVID-19 pandemic, a Midwestern prelicensure BSN program utilized simulation as a teaching modality for end-of-semester remediation with first-semester nursing students. These simulations were done face-to-face pre-COVID-19 but moved to virtual with pandemic restrictions. At this University, stu-

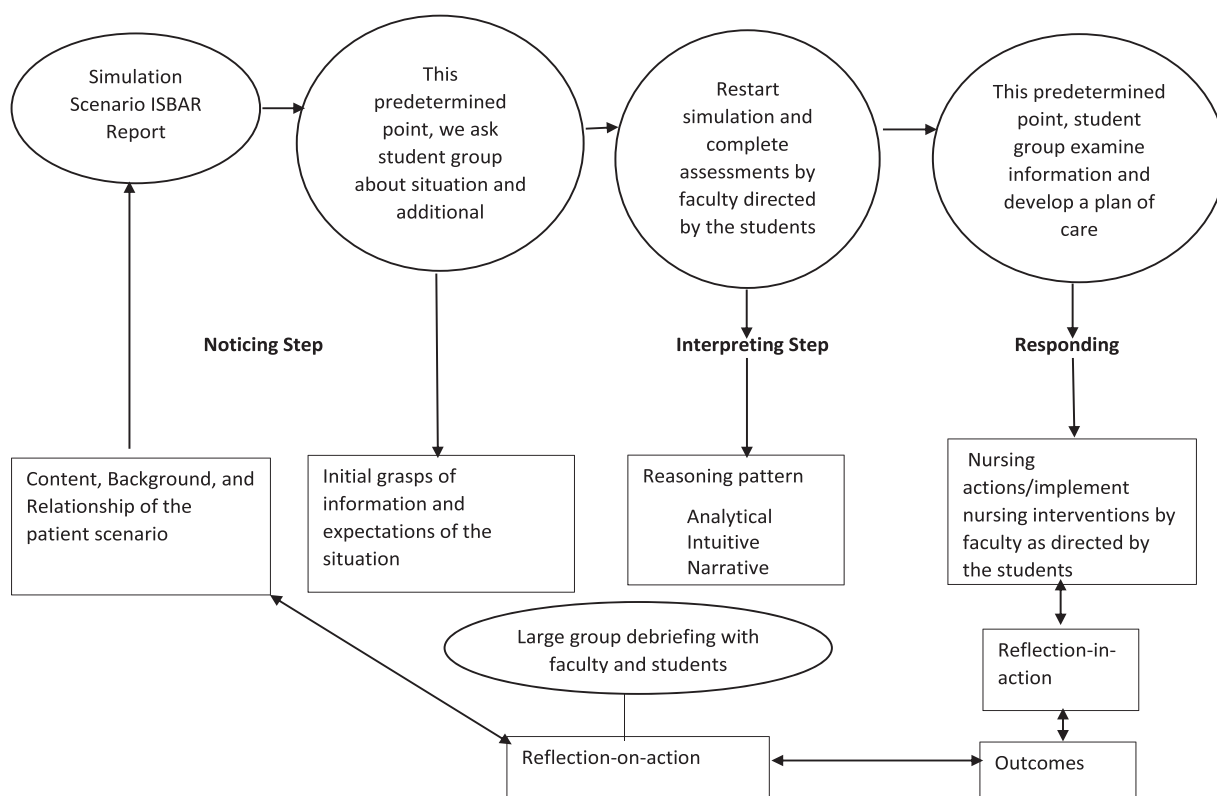


Figure 1 Use of Tanner's Clinical Judgment Model for Simulation. Note: [Tanner, C. \(2006\)](#). Think like a nurse: A research-based model of clinical judgement in nursing. *Journal of Nursing Education*, 45(6), 204–211. <https://doi.org/10.3928/01484834-20060601-04>

dents enter the Nursing program after three semesters of prerequisites. As part of the Nursing Department program evaluation, Health Education Exam Inc. (HESI) specialty exams are taken by students each semester. These exams are designed to measure students' abilities and apply concepts related to specific nursing content areas and help prepare students to confidently pass the NCLEX-RN (Elsevier, 2021). As part of a regular course assignment, each semester, after exam results are obtained, remediation is planned and typically is focused on the individual student's results. For first semester students, the specialty exams utilized are pharmacology and pathophysiology and instead of requiring the students to remediate individually, the aggregate results are reviewed and areas needing remediation are identified. For the semester described here, these areas included the nursing process (evaluation), management of care, safety nursing concepts skin integrity and respiratory. A team of two full-time PhD-prepared expert nursing faculty and two MSN-prepared Certified Healthcare Simulation Educators with several years of simulation experience developed learning objectives and simulation scenarios based on the areas of weakness utilizing *INACSL Standards of Best Practice: Simulation* (INACSL Standards Committee, 2016). This approach is unique, as it involves the entire class rather than specific students using Tanner's Model to facilitate clinical judgment.

During development of the remediation simulation scenarios, pre-COVID-19, the simulation team decided on a design that would involve the entire class, in which the simulation team assumed the role of patients and nurses for each scenario. The simulation modality included a modified shadowbox technique utilizing real-time scenarios rather than videos, along with predetermined decision points and pauses for student input and discussion for next actions and rationale. The shadow box technique allows learners to view experts in action through video excerpts with predetermined pauses for decision making, in which learners have an opportunity to provide input regarding prioritization and further actions with rationale through discussion (Harder & Turner, 2020). After discussion, video continues with appropriate actions facilitated by experts. In the face-to-face simulated lab environment, a lead facilitator presented each scenario to the class of 32 students starting with a report using the Identify, Situation, Background, Assessment, Recommendation (ISBAR) framework. The facilitator would then guide the students through the scenario, stopping at predetermined points. During this time, the students were asked specific questions related to the remediation topics, using terminology from the clinical judgment model. Students were then asked to describe what nursing actions and interventions should be implemented next, along with rationale for these actions. Students would then advise the educator in the nurse role on the next

steps to take. The simulated scenario would subsequently resume with nurses in the scenario carrying out the students' suggestions for care including assessments and interventions. This guided facilitation process occurred at least three times for each scenario. Following the simulation, students participated in a facilitator-guided debriefing session, which incorporated standardized debriefing questions including questions specific to Tanner's Clinical Judgment model.

Amidst the COVID-19 pandemic, the previous approach to end-of-semester remediation using face-to-face simulation, described above, needed modifications to meet educational and safety requirements. The simulation design was modified to include virtual live synchronous simulation, in which educators enacted the simulation from the simulation lab via the University approved learning platform. Instead of a group of 32 students, the class was divided into 16 students per group and scenarios were repeated numerous times.

To make each simulation scenario engaging, simulated patients were developed using a fun approach, such as serious gaming, in which fun encourages engagement (Perski, Blandford, West, & Michie, 2017). The patients in the scenarios were dramatized holiday characters, dressed appropriately for their role, with diseases or injuries related to their job. For example, Santa Claus had diabetes, elevated blood glucose, and a third-degree burn from a workplace injury. Buddy Elf had a history of asthma and was exposed to toxic fumes in the workplace. Each patient was animated and fun as they portrayed their character (see Figure 2). The students commented on how the "fun" approach helped to keep them engaged and attentive. Characters are changed depending on the time of year when the simulation occurs and include summer themed activities and characters, such as an ice cream truck driver. This project was submitted to the University IRB and determined to be an exempt status.

Results

The virtual simulation offered students the opportunity to practice clinical judgment by breaking down their thinking into the four steps of Tanner's Model. This was accomplished through intermittent predetermined stopping points during the simulation and guided debriefing session at the end. Debriefing was conducted at the end of each live virtual simulation using the Gather-Analyze-Summarize (GAS) framework to review clinical events through active listening, guided reflection, and review of lessons learned (Cheng, Rodgers, van der Jagt, Eppich, & O'Donnell, 2012). Guided debriefing questions were developed to include specific language facilitating clinical judgment. During debriefing, the simulation team led students through a guided analysis of the simulation, focusing on prioritization, noticing, and interpreting assess-

ment findings, responding through interventions, patient-centered education, and evaluation of outcomes. The simulation experience was evaluated through anecdotal feedback. As part of the routine systematic simulation program evaluation, students also completed an online version of the reliable and valid Simulation Effectiveness Tool-Modified (SET-M) (Leighton, Ravert, Mudra, & Macintosh, 2015). The SET-M was originally developed in 2005 to assess how well simulation met student learning needs. It was updated to be consistent with INACSL Standards of Best Practice, QSEN practices, and the American Association of Colleges of Nursing baccalaureate essentials. The data presented here is part of simulation program assessment.

Results of the SET-M were completed as a part of simulation evaluation and permission was obtained from the Nursing Department to utilize the results for dissemination outside of the University. Results indicated students agreed the simulation was effective in all the areas (pre-briefing, learning, confidence, and debriefing). Fifty-five students completed this anonymous survey and only one item received less than 90% agreement, "I developed a better understanding of medications," which 79% of students agreed. This is an area that could be strengthened in future simulations (see Table 1). Overall feedback was positive, students indicated the activity was a fun and interactive way to enhance learning. It should be noted this was not a research study and the outcomes of clinical judgment and knowledge were not measured other than student perception.

Several themes were identified from the student's feedback (see Table 2). First, students found the predetermined stopping points helpful and liked interacting as a group through real-time engagement with the educators. Students indicated, stopping points allowed them to project their thoughts and opinions, practice prioritization skills, and make decisions in real-time before the simulation evolved. Students were also able to determine appropriate assessment and interventions the nurse should implement and observe results of the nurse's actions through coaching during each pause. Students indicated they enjoyed the opportunity to observe the simulation and see professionals enact the roles. The structure of the simulation allowed faculty and simulation educators to provide immediate feedback to students on their decision-making.

One limitation to the design of the simulation included the informal structure of predetermined stopping points. Students were not called on to speak but instead asked to share their thoughts. In the future, it would be helpful to have students raise their hands via the "raise hand" icon allowing educators to call on students to diversify responses. Another limitation is the inability to monitor students during the simulation. Although the platform used allowed students to show an image, as with many virtual platforms, it can be challenging to monitor students when cameras are turned off. Students were asked to turn on

Table 1 Responses to Simulation Effectiveness Tool- Modified (SET-M)

Item and Subscale	Percent Agreement
Prebriefing increased my confidence. (PREBRIEFING)	98%
Prebriefing was beneficial to my learning. (PREBRIEFING)	100%
I am better prepared to respond to changes in my patient's condition. (LEARNING)	100%
I developed a better understanding of the pathophysiology. (LEARNING)	100%
I am more confident of my assessment skills. (LEARNING)	98%
I felt empowered to make clinical decisions. (LEARNING)	100%
I developed a better understanding of medications. (Leave blank if no medications in scenario) (LEARNING)	79%
I had the opportunity to practice my clinical decision-making skills. (LEARNING)	100%
I am more confident in my ability to prioritize care and interventions (CONFIDENCE)	100%
I am more confident in communicating with my patient. (CONFIDENCE)	100%
I am more confident in my ability to teach patients about their illness and interventions. (CONFIDENCE)	100%
I am more confident in my ability to report information to health care team. (CONFIDENCE)	98%
I am more confident in providing interventions that foster patient safety. (CONFIDENCE)	100%
I am more confident in using evidence-based practice to provide care. (CONFIDENCE)	100%
Debriefing contributed to my learning. (DEBRIEFING)	100%
Debriefing allowed me to communicate my feelings before focusing on the scenario (DEBRIEFING)	100%
Debriefing was valuable in helping me improve my clinical judgment. (DEBRIEFING)	100%
Debriefing provided opportunities to self-reflect on my performance during simulation. (DEBRIEFING)	100%
Debriefing was a constructive evaluation of the simulation. (DEBRIEFING)	100%

Note: N = 55.

Table 2 Narrative Responses to Simulation Effectiveness Tool- Modified (SET-M)

Responses to Open Ended Question: What Else Would You Like to Say About Today's Simulated Clinical Experience?	
Theme	Sample Quotes
Predetermined Stopping Points	<p>"I greatly enjoyed the intermittent debriefing throughout the simulation, allowing the students to project their opinions. This interaction was valuable, for it allowed many to be exposed to different patterns of thinking in a large brainstorm setting."</p> <p>"Although we were online for this sim, the faculty still allowed the students to make clinical decisions regarding the patients' health and care and that means a lot to the students."</p> <p>"I liked how we stopped every so often to reflect and to give next directions of what should come next in the simulation."</p> <p>"I also really liked how you guys would start and stop the sim and have us fill in the blank it kept me involved."</p>
Observe Professionals Enact Role	<p>"It was good to have a change of perspective during a simulation. Instead of us being the nurses we were able to tell the nurse what to assess and questions to ask."</p> <p>"Being able to see the simulation being played out helped me see what issues still needed to be addressed and I was able to better understand the patient's condition."</p> <p>"I think seeing another person complete the simulation was very helpful from an onlooker's perspective. It gave me the opportunity to see many things about the nurse-patient relationship, particularly, how therapeutic communication leads to good interactions with patients."</p> <p>"I like that I could watch the simulation and not be part of it, so I can reflect on what I was watching not what I was doing.(If I was the nurse, I probably wouldn't have thought of all the things I did while I was watching the simulation."</p>
Virtual Simulation Platform	<p>"I think this is an excellent virtual lab you can use to truly see student's involvement."</p> <p>"It was still a real experience even though we weren't in class."</p> <p>"This virtual simulated experience aided in furthering more learning more learning effectively, rather than watching online/video simulations."</p>
Humor	<p>"Thank you for the humor added in"</p> <p>"I enjoyed that all of the professors made it entertaining to learn, it made the simulation more fun and I felt more comfortable expressing my answers."</p>



Figure 2 Standardized patient phot.

their cameras, however, it was not required to protect their privacy. Furthermore, there were minor issues with students having difficulty hearing the live stream simulation. However, this was quickly corrected. Also, the time commitment and use of human resources were intensive due to the need for the simulation to run multiple times to keep the student groups small and engaging.

Based on positive student feedback, the simulation team plans to implement the same engaging virtual simulation design, utilizing humorous characters in future semesters. Characters will continue to be a seasonal theme relevant to the semester. The “raise hand” icon will be applied and discussed in simulation pre-briefing to allow all students to engage. Although permitting students to have their cameras

off during the simulation is not ideal, the team agrees it is necessary to allow this option to protect student privacy and create a psychologically safe learning environment. In addition, based on feedback regarding helpful input from other students for next steps, this format is being trialed in current face-to-face simulations. In addition, based on student feedback, the simulation team plans on implementing a “Lifeline” for students, in the nurse role, to use during simulation. They will be able to use this if they need to pause and ask for help on how to proceed from other students observing or simulator facilitators to assist with coaching them in the nursing role. As we move forward with face-to-face instruction, we will continue to utilize a hybrid approach to accommodate quarantine students with

the virtual format. Anecdotal feedback thus far has been very positive. We will continue to evaluate student feedback on simulation design modality to determine the most effective delivery method, virtual, hybrid, or face to face. We would also like to investigate the statistical improvement of student knowledge and clinical judgment by potentially conducting a study on this simulation with a pre and post-test design.

Conclusion

Although researchers have found positive outcomes with virtual simulation, traditional virtual simulation has limited educator-student interaction that is both synchronous and engaging. During the pandemic, when many nursing courses were online, both students and faculty struggled with a lack of meaningful human interaction. Implementation of this live synchronous virtual simulation incorporating humor, was consistent with current research on integration of humor into course content, as students remained engaged and motivated to participate. This method also offered a fun and engaging way for students to interact with educators through effective well-planned group remediation. Evaluation feedback from the project further supports current research findings related to use of virtual simulation to enhance student learning and clinical judgment. The evaluation indicated pauses during the scenarios for discussion and debriefing at the end of the scenarios were valuable in helping to improve students' perception of clinical judgment in 100% of the students surveyed, and most students responded positively to post-simulation survey questions focused on learning.

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