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Meeting our students' educational needs during a global pandemic: Creating online clinical learning experiences

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ABSTRACT

The purpose of this paper is to describe the conversion of in-person simulations into online evolving case study activities in an undergraduate nursing curriculum as a result of COVID-19 precautions. The School of Nursing at Eastern Kentucky University utilized technological resources to provide meaningful online learning activities to meet student learning outcomes. The key teaching strategies to maintain were application and synthesis of knowledge through guided reflective activities and discussion. Interactive evolving case studies were selected with critical thinking questions and video clips to promote student engagement. The curricular concepts were medication administration, prioritization of patient care, communication, patient safety, and clinical judgment. Student and faculty evaluations were overwhelmingly positive, resulting in sustained use of these teaching strategies within the curriculum.

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As an applied science, nursing has a long history of valuing the educational opportunities supplied by clinical and laboratory activities. More recently the profession has come to appreciate the educational value of simulation experiences. Simulation provides students with a safe learning environment in which to develop and demonstrate critical thinking. Scenarios give students opportunities to engage in realistic patient care that mirrors the practice setting. The patient care that students provide during a simulation is an opportunity to demonstrate medication administration, communication, collaboration, and clinical judgment and evaluate patient safety. A simulation is followed by a debriefing session facilitated by faculty, which is a reflective discussion to identify key aspects of learning. When COVID-19 limited in-person clinical and simulation opportunities, faculty in the School of Nursing (SON) searched for creative ways to incorporate the active learning techniques used in didactic courses with the high-quality learning aspects of patient care simulation in an online learning environment.

Supporting Literature

Simulation

Cant and Cooper (2017) published a meta-analysis of in-person simulation studies and found simulation improved clinical knowledge, critical thinking, self-confidence, perceived competence, satisfaction, self-efficacy, and awareness of patient safety. The improved knowledge was measured and sustained up to several months post-intervention, other outcomes were not measured for sustainability over time. In a national randomized controlled trial, The National Council of State Boards of Nursing found simulation could effectively meet learning outcomes and substitute undergraduate nursing clinical experiences (Hayden et al., 2014). More recently, Sullivan et al. (2019) studied the acceptable ratio for substituting clinical time with simulation experiences. Evidence supports a 2:1 ratio for clinical to simulation time, based on the quantity and quality of student experiences each opportunity provides. Sullivan et al. (2019) found simulation debriefings are a higher level of application than clinical post-conference discussions and provide more critical thinking time.

Ewens et al. (2016) found virtual simulation experiences support critical thinking and decision making, while increasing student engagement. Cobbett and Snelgrove-Clarke (2016) completed a randomized controlled trial comparing outcomes of virtual and face to face clinical simulations and found no significant differences in student knowledge or self-confidence levels. These findings support the development and use of virtual clinical opportunities to meet students clinical learning outcomes.

The Role of Evolving Case Studies, Video Clips, and Guided Questions

Evolving case studies have been used in the classroom, as well as for simulation development, and have been found to increase student self-confidence (Debrew & Hensley-Hannah, 2017; Woda et al., 2017). Verkuyl et al. (2017) evaluated an online evolving case study and found students reported a high level of engagement, and an increased level of satisfaction, knowledge, and self-efficacy. Therefore, it seemed feasible to use simulations to develop evolving case studies for online use.

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Faculty teaching in didactic courses encourage the development of critical thinking and engage students by using various active learning techniques such as case studies, open-ended questions, video clips and discussions. Liao (2020) completed a study using video clips and reflection in professional learning and found this technique assisted learners in building connections across curricula and with relevant experiences in other settings. Liao (2020) stated that when students are able to decide which experiences are important to learning, while receiving faculty guidance, these opportunities facilitate reflection and appropriate action, at present and during future practice. Griswold et al. (2017) completed a study on how embedding questions during online lectures assists with the transfer of knowledge. They found that guided questions promoted learning and transfer of knowledge, so that concepts were readily applied to real life situations.

Wood et al. (2018) used guided questions in class as an active learning approach to promote dialogue with students. This technique allowed for the clarification of misunderstandings when concepts were inappropriately applied. These collaborative discussions encouraged students to build on others' ideas. The process pushed students to move beyond simple memorization and recall, which assisted students in making sense of content. Wood et al. (2018) conducted a study of a flipped classroom approach using constructive inquiry as a way to elicit explanations, apply theory, evaluate evidence, and justify reasoning. Using the pedagogical technique of guided questions over the course of the term encouraged a sense of curiosity in students. Based on these findings from the literature, faculty in the SON utilized video clips, embedded critical thinking questions, and reflective inquiry to implement online clinical experiences for undergraduate nursing students.

Planning

Simulation faculty met with faculty who serve as course leaders to plan the conversion of in-person simulations to online learning. The key concepts the SON sought to preserve were application and synthesis of knowledge through guided reflective activities and discussion. Interactive evolving case studies were selected and enhanced with critical thinking questions and video clips to promote student engagement. The following in-person simulations were transferred to the online learning environment as evolving case studies: fluid volume overload with heart failure, seizures, myocardial infarction, and end of life care. Each of the online activities incorporated curricular threads of patient safety, medication administration, communication, collaboration, and clinical judgment. The conversion of the heart failure simulation is discussed in further detail below.

Implementation

Students received heart failure content in lecture and were required to complete a pre-assignment of nine questions prior to attending the online clinical activity. Thus students had the baseline knowledge to process the care a client with heart failure may require. Pre-assignment work was checked by faculty for completion. At the beginning of the session, faculty reviewed the expectations of performance during the online clinical activities. Students were encouraged to participate and work together to provide care for the virtual client. To set the scene, the current state of the client was shared with the students. This included patient demographics, reason for admission, past medical history, allergies, home medications, code status and social history.

Effective communication was one of the key curricular threads woven throughout the online activities. The students discussed the communication instrument recognized in health care: S-situation, B-background, A-assessment, and R-recommendation. Students then received a report on the virtual client utilizing SBAR format. Provider orders and medications were provided to students during handoff. The students were asked to discuss signs and symptoms of heart failure. Faculty took notes, but only contributed to the discussion when students articulated inaccurate information.

Video Clip One

After faculty gave the students a brief report about the patient's condition, time was permitted for a student-led discussion, and the first video clip was introduced. The video clip illustrated the nurse settling the client into the hospital room after admission. The nurse completed safety checks, a focused assessment, and vital signs. All key findings were stated clearly for the students to hear. For example, upon auscultation of breath sounds, the nurse heard crackles in the bases and stated to the client, "I am hearing some crackles in the bases of your lungs." Abnormal patient findings during the initial video included tachycardia, tachypnea, increased blood pressure, pitting edema, 1+ peripheral pulses, and crackles upon auscultation. After the video clip was completed, students collaborated to identify abnormal findings and discuss relevant observations from the video. For example, one student stated, "We hear about safety checks all the time, but it was beneficial to see a nurse perform safety checks as part of the initial assessment to see how to incorporate it into practice."

Guided Reflection Questions

Immediately following this discussion, students completed two multiple choice questions with four possible answers, via online polling software. Answering the questions was required and anonymous. The polling questions encouraged students to prioritize care interventions and develop their clinical judgment skills: 1. Which assessment finding is the most concerning? 2. Which of the following is the priority intervention? Faculty led the discussion about each polled question by asking open-ended questions which allowed students to share their thought processes. This was a pivotal component of the online activities. During this conversation, faculty were able to clarify misunderstandings by discussing rationales for both the right and wrong answers.

Video Clip Two

Students then watched a 3-minute video clip in which the patient experienced a substantial change in condition. They observed the nurse gathering both objective and subjective data related to the patient's deterioration. For example, subjectively the patient complained that she was "uncomfortable" and "short of breath." Objective data included the following changes in respiratory status: worsening tachypnea, tachycardia, a decrease in oxygen saturation to 86% and worsening lung sounds on auscultation. The video clip ended with the nurse increasing the oxygen setting, resulting in the patient's oxygen saturation rising to 92%. The night shift nurse entered the patient room to receive change of shift bedside report and the video ended.

Faculty asked the students what priority care needed to be given to the client and collectively the students decided the health care provider should be notified about the change in patient condition.

SBAR Activity

Students developed a SBAR report for the client. This interactive, collaborative activity began with faculty asking students to identify what patient information was essential to communicate with the provider. Student suggestions were typed on a word document and

shared via the online platform. Faculty guided the students to place the data in one of three categories: situation, background, and assessment. The document was a work in progress in that students added details to each section. The document was merged with the faculty key for comparison. Students collaborated to develop the recommendation portion of SBAR. The provider gave the following orders: discontinue the intravenous fluids, administer intravenous furosemide, and draw a serum potassium level in one hour.

Video Clip Three

During this 4-minute video clip, the client received intravenous furosemide, which provided the students with the opportunity to visualize safe medication administration. Follow-up discussion focused on student observations about medication administration of a slow intravenous push medication, including nursing implications and monitoring.

Guided Reflection Question

Immediately following this discussion, students completed one multiple choice question with four possible answers via an online polling platform. The polling question encouraged the students to prioritize care and further develop their clinical judgment skills. Question three was: Based on the data in the video, which action should the nurse take? Faculty asked open-ended questions and discussed the rationales for correct and incorrect answers to the polling question. During this conversation, faculty were able to observe and analyze students' responses and clarify misunderstandings.

Video Clip Four

Students observed a 1-minute video of the patient monitor and were asked to interpret findings. Through discussion, students determined the patient was experiencing premature ventricular contractions. Faculty asked open-ended questions that encouraged students to investigate the potential root cause of the new finding and discuss applicable interventions to ensure patient safety. The key concept of this discussion was consideration of the implications related to lab values for a client diagnosed with acute exacerbation of heart failure.

Putting It All Together

The video clips, student and faculty discussions, along with embedded guided reflection questions, reinforced the concepts of patient safety, medication administration, communication, collaboration, and clinical judgment. To emphasize these key components of the session, faculty asked two questions: 1. What is the primary focus of care for this client? 2. How will this impact your future clinical practice? Students collectively agreed the focus was nursing care and evaluation of a client with heart failure who was experiencing fluid overload. To answer the question regarding how their future practice would be influenced, student discussion included: focus on patient safety, SBAR report, teamwork, nursing judgment, attention to detail, and prioritization of care. One student statement that resonated with faculty was "I learned to not stop after addressing my patient's symptoms, but to also further investigate and treat the underlying cause."

Evaluations

Students completed an anonymous online survey including eight Likert scale questions and one open-ended question. The Likert scale responses ranged from Strongly Agree to Disagree. The first four questions focused on the curricular concepts of patient safety, medication administration, communication, collaboration, and clinical judgment. Questions five through eight focused on content from the guided critical conversations between faculty and students during the session. Forty-two out of 43 participating students responded to the survey, and 98% strongly agreed that the online simulation met all of the learning objectives. Question nine asked, "What else would you like to say about today's virtual activities?" The following are some of the student responses:

- "This was a wonderful way to improve our understanding of a common condition and give us more insight to increase proficiency and decision making. Great COVID era accommodation! I would love more of these and would attend even if they were voluntary. These definitely fill in the gaps and bridge classroom with bedside."
- "This actually really helped me just by being in a different environment than clinical because it was more guided. I feel like more of these simulations would be helpful with other case study scenarios as well in the future."
- "I feel like today really helped me to prioritize interventions."
- "I think the tying together of all the information was a big help. Especially the videos of the assessments and the patient safety taking place within the assessment."
- "The feedback during the simulation really helped me for future clinical experience!! Today was super helpful in building my confidence."
- "Really enjoyed this. I was a little nervous going in, but it turned out to be a fun and great learning experience. I would enjoy more activities such as these."
- "I enjoyed the team work and bouncing ideas off each other. It's good to brainstorm and be guided by experienced nurses."
- "I enjoyed being able to bounce ideas off of instructors and classmates in a non-judgmental environment."
- "It was very helpful to go over in a group setting. I enjoyed everyone's feedback and the group presentation. It will definitely improve the way I care for patients in the near future."
- "I really enjoyed this experience. It is wonderful to get small group scenarios specific to common conditions we will encounter in order to increase our proficiency at the bedside and with our decision making. I would do these even if they were voluntary."
- "It was beneficial to see the simulation and help contribute to the care without the repercussions of making a mistake."
- "The biggest struggle for me last semester was critical thinking and I feel like simulation really helped connect concepts in critical thinking skills."
- "This was wicked helpful! Thank you!"
- "The simulation was an invaluable learning opportunity where I could process and work through a patient scenario in a less risky environment. . . As a new student I think this simulation was vital. I wish I had had the opportunity to do this sooner and will do so more frequently in the program. I think it helps to solidify all that we are learning and to gain from the experience, knowledge and understanding of my classmates and professors."

Faculty Feedback

After each session, faculty had the opportunity to debrief. These meetings were 5-10 minutes long and immediately followed the virtual clinical activities. A follow-up email was also sent to faculty who participated in the sessions. Both the meeting and the follow-up email offered opportunities for faculty to provide feedback about the structure and success of the simulation activities. All comments were positive and no areas for improvement were identified. Faculty comments included: "This was incredible. It was so interesting to see the virtual clinical activities- students were more engaged than I ever dreamed they would be" and "This activity was an excellent way for students to process patient care and critically think. Students were prepared and engaged."

Conclusion

COVID-19 presented several educational challenges. In particular, nursing educators had to quickly convert in-class activities to an online platform. While simulation is historically an in-person venture, the conversion to an online environment was demonstrated to be effective for student learning. By converting an in-person heart failure simulation into an online activity, students were able to participate in critical thinking, safe patient care, and clinical decision-making. Patient care decisions, such as priority nursing interventions for a patient in fluid volume overload, were discussed through online polling and open-ended questions. Student evaluations were overwhelmingly positive, and participants reported the activity increased their confidence and critical thinking skills. Due to the positive evaluations from students and faculty, and the achievement of learning outcomes, faculty plan to continue and expand online clinical experiences in the curriculum.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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