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Using Debriefing for Meaningful Learning with Screen-Based Simulation

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Abstract

Background

COVID-19 has led to increased use of screen-based simulation. However, the importance of including a robust debriefing as a component of these simulations is often neglected.

Problem

Failing to include debriefing with screen-based simulation could negatively impact student learning outcomes.

Approach

Debriefing, including recollection, discussion to reveal understanding, feedback and reflection, is a process of helping learners make sense of learned content and knowledge as it is applied to the patient care experience. Debriefing for Meaningful Learning (DML) is an evidence-based method derived from theory, which can be easily incorporated into screen-based simulation to augment the clinical learning experience.

Conclusion

By guiding learners to consistently engage in DML, clinical decisions and actions taken during virtual simulations can be uncovered, discussed, challenged, corrected, and explored. Including a synchronous, structured debriefing like DML ensures that screen-based simulation results in meaningful learning in addition to performance feedback to foster safe and quality patient care.

With the arrival of the COVID-19 pandemic, nursing faculty have raced to move coursework including clinical experiences to different forms of remote delivery while still achieving required course and program outcomes. Many programs are turning to virtual screen-based simulation (SBS) as an alternative to traditional clinical experiences and manikin-based simulation, yet not all educators are prepared to implement clinical virtually at a distance. With the lack of access to patients in hospitals and clinics to complete needed clinical hours, prelicensure and graduate nursing programs alike are taxed with alternative ways of satisfying licensure and certification requirements, and simulation use is rising to meet this need. Historically, some prelicensure programs substituted a proportion of student clinical experiences using traditional simulation modalities including manikin and standardized patients. How much simulation could be used for clinical time depends on state board of nursing regulations.[1] Although prelicensure programs can substitute up to 50% in some states, advanced practice nursing programs have been limited by accreditation and regulation bodies to supplementing minimum required face-to-face traditional clinical hours. Since the disruption of COVID-19, however, nursing clinical sites are limited, and programs and boards of nursing are turning to alternatives like virtual SBS to teach nursing practice and provide clinical experiences to students.

Due to these urgent clinical learning needs, producers of SBS resources have offered discounted access to valuable resources to provide new distance accessible virtual learning experiences that may not have been integrated into clinical courses otherwise. Moreover, free and no-cost options developed by individual programs, simulation consortiums, and simulation organizations have also been widely disseminated. However, the importance of including a robust debriefing as a component of these screen-based learning opportunities is often neglected, which limits student learning outcomes.[2]

Approach

Debriefing after simulation and traditional clinical practica is a process of helping learners make sense of learned content and knowledge applied to patient care experiences. Debriefing allows learners and debriefers to revisit the encounter reflectively and learn from what happened by verbally analyzing and synthesizing the thinking and decision-making processes in addition to the actions that occurred.[2–5] Debriefing often includes feedback to assist learners in determining what went right, what went

wrong, and what should be done differently next time.[6–8] There are different methods of debriefing utilized by nursing programs; the key, however, is to debrief in a purposeful manner using a theoretically derived and evidence-based method[8–10] intentionally and consistently, to provide deliberate practice for thinking like a nurse.[3]

Screen-Based Simulation

SBS has been used increasingly in nursing education to achieve positive learning outcomes.[9-11] Although this is of great value during the pandemic-related suspension of face-to-face classes, the increased use also brings new challenges for nurse educators. It is important to first understand what virtual reality and SBS are, because the lack of standardized terms describing virtual learning experiences creates confusion when describing them and interpreting the resulting outcomes.[12,13]

The term *virtual reality* is used broadly to describe any learning that is offered in a reality that is not the current physical environment. On one hand, virtual reality simulations include immersive, highly realistic experiences involving the participant's multiple senses using special glasses, headsets, and/or gloves. Alternatively, the SBS is portrayed as a 2-dimensional image on a computer, phone, or tablet screen where the participant manipulates the characters and responds to prompts similar to apps or games.[14] Some screen-based programs also track responses and provide feedback to learners.

The success of any experience offered in a virtual environment is dependent on the level of realism and immersion that increases the learner's sense of presence or “being there” to meet the specific objectives of the learning activity.[10,15–17] A learner's sense of presence is enhanced by interacting with the screen-based virtual environment and seeing the immediate changes, based on their avatar's performance in that environment.[16,18] Learners assume the role of a health care provider as they progress through a series of decision-making options or clinical skills performance while interacting with virtual patients.[19] The most common form of virtual clinical experiences today is screen-based computer software–based programs.

SBS can provide learners with a consistent experience in a safe, reproducible, and standardized clinical environment that exhibits a high level of realism and interactivity.[18,19] Learners have reported increased satisfaction as compared with traditional learning methods[9,14–20] and increased engagement because of the safe virtual environment in which new skills can be practiced.[21] Moreover, the advantages to SBS include portability, affordability, accessibility, scalability, and adaptability.

The accessibility of SBS is appealing to educators. Therefore, SBSs are the most frequently used virtual learning systems[9,14,18] because students can choose the time and place for practicing a clinical scenario independently, as well as have the opportunity for deliberate repeated practice.[9,10,15–17,22,23] There are no additional equipment or consumable supplies required for SBS, although many require a subscription. With greater access to practice opportunities, gaps between formal theory and practical learning can be easily bridged.[15,20,21]

Many studies have reported positive learning outcomes achieved through virtual screen-based learning activities, particularly when used repeatedly.[15,17–20,23–25] Foronda and colleagues[26] conducted a systematic review to synthesize the nursing education research. Although not specific solely to SBS, 80 studies were included that reported improvements in student learning or knowledge (n = 47), skill

performance (n = 29), learner satisfaction (n = 41), critical thinking (n = 10), and self-confidence (n = 13).

SBS is also valued because of the opportunity to receive immediate feedback regarding skills performed and to challenge student assumptions without learners feeling shamed.[13,22,31,32] Some SBSs track and record every decision and consequence made during a scenario.[15,18,23] These data give detailed feedback on each learner's performance, through a generated report at the end of a scenario. Because the feedback and scoring of achievement of learning objectives are immediate, some educators believe that the cognitive load of the learner is lightened, even while the nursing student is developing safe habits related to patient care.[27] Many SBSs also allow learners to replay the scenario, which appeals to learners who want to repeat the scenario until they do it perfectly. Although performance feedback logs are helpful for learners to independently correct their actions, this does not ensure that the thinking underlying these actions has also been corrected. If educators rely on a "perfect" feedback log as an indicator of correct thinking and understanding, learners may leave the simulation encounter with a flawed knowledge foundation of clinical practice. SBSs are viewed as a brain-based educational strategy to grasp, or take in, a concrete experience of clinical care in the experiential learning framework.[28,29] However, to move this into a theoretically derived approach of teaching and learning, the concrete experience must be transformed or analyzed with challenging and thoughtful dialogue.[29,31] Therefore, transformation of these experiences occurs in the most well-supported pedagogical practice during simulation: the debriefing.[5,29,32,33]

Debriefing SBS

Because it is common for each learner to independently complete a screen-based scenario or task training module on their own device, these individualized experiences provide unique challenges for meaningful group debriefing.[9] Debriefing dialogue is acknowledged as a key element of simulation for transfer of knowledge and skills,[2,5,35] yet the debriefing after an SBS is rarely described beyond the computer-generated feedback log associated with the program.[10,15] In the studies that did, it was commonly facilitated by 1 debriefer talking with a group of students to review the scenario for 15 minutes,[19] 20 minutes,[20] or 1 hour.[27] Despite the difference in debriefing time, each of these studies found improvements in learner outcomes measured in a variety of ways.

When 3 types of debriefing were compared: (1) traditional facilitated in-person debriefing, (2) facilitated virtual debriefing using synchronous videoconferencing, and (3) self-debriefing where the learner answered predetermined questions without a debriefer, each method led to knowledge gain.[34] However, Gantt and colleagues[30] found that students and faculty valued facilitated group debriefing more than self-debrief because the latter did not offer an opportunity for feedback and guided reflection. In fact, self-debriefing resulted in the lowest rating of the different debriefing experiences.[30,35] This may be because self-debriefing does not allow for the opportunity to uncover thinking that underpinned the decisions and actions of the learner. Their reflection is limited to their own answers to preestablished questions and the automated feedback indicating whether the actions taken in the SBS were right or wrong. Importantly, self-debriefing paired with or followed by facilitated debriefing was also rated more favorably than self-debriefing alone.[35,36]

Overview of Debriefing for Meaningful Learning

Debriefing for Meaningful Learning (DML) is a debriefing method that focuses on the development of clinical reasoning by exploring the relationship among thinking, actions, and patient responses, in the context of assimilation, accommodation, and anticipation.[33] DML uses reflection-in-action, reflection-on-action, and reflection-beyond-action[33,37] to teach clinical reasoning and thinking like a nurse, by assisting learners in making relationships among cues, thinking, actions, and patient responses.[40]

DML follows a constant, unwavering structure each time, using the DML worksheets to provide visual learning and double-loop learning opportunities for learners.[37,38] The worksheets guide the debriefer and learners through the DML process: (1) recall what happened in the scenario, (2) engage in an overall reflective discussion including unpeeling the thinking underpinning the learner's actions and uncovering taken-for-granted assumptions, (3) review reflection-in-action including assimilation and accommodation, (4) review reflection-on-action focused primarily on accommodation, and (5) provide an opportunity for reflection-beyond-action or anticipation.[37,38]

By guiding learners to frequently and consistently engage in reflective discussions, clinical thinking and actions are uncovered and associated with knowledge and past experience. This knowledge is then assimilated and accommodated, thereby facilitating meaningful learning (Table). The debriefer uses individualized Socratic questions to uncover the thinking and decision making behind the actions taken, facilitating metacognition and the transfer of knowledge into patient care.[3]

Table - Concepts and Constructs for Virtual DML Debriefing Questioning

Concept	**Construct**	**Example Questions**
Exploring thought processes Challenging taken-for-granted-assumptions	Right thinking/right action Wrong thinking/wrong action Right thinking/wrong action Wrong thinking/right action	When is that true? Is it always true? What makes you sure? What were your thought processes? What made you decide to do that? Some of you made choice a and some choice b. Let us talk about the information in the scenario that led you to different decisions.
Assimilation Accommodation	Reflection-in-action	What are the critical decision-making points in this virtual screen-based simulation scenario? What are the take-away points that we can apply to patient care next time?
Accommodation	Reflection-on-action	What would you do differently next time you encounter this situation or one that is similar? What would you change about your thinking or actions now that we have discussed the experience together?
Anticipation Application	Reflection-beyond-action	What if instead of this patient we have just cared for, you encountered a patient with… (debriefer presents a parallel case that has similarities and differences for the learner to apply what they have learned).

Using DML With SBS

DML can be easily adapted for use with SBS following the same sequence used with other simulation and clinical experiences. Like other modalities, SBS should include preparatory work, synchronous prebriefing prior to the SBS, and a guided synchronous DML debrief using videoconferencing platforms. Preparatory work sets the stage for the learners and focuses their attention on the clinical attributes of the simulation.[39] Prebriefing can be a synchronous or asynchronous discussion before the start of the SBS to (1) review the technology, (2) present the case, (3) answer learner questions, and (4) have everyone complete the top portion of the second page of the DML worksheets describing their plan for the experience and desired client outcomes. Throughout prebriefing and debriefing, the conversations are considered privileged and private to uphold the trusted safe container.[40]

While completing the SBS, learners are instructed to chronologically write or type each action they did virtually along with the associated client responses on their copy of the DML worksheets. If they repeat the simulation, they can add any different actions and responses on the same worksheet. Just before debriefing, computer-generated reports or dashboards of each student's experience should be reviewed by the debriefer to provide an understanding of how each learner proceeded through the simulation as well as group trends and outliers. When it is time to debrief, everyone gathers synchronously online again. First, there are 2 to 3 minutes of silence for the learners to complete page 1 of the DML worksheets independently.[37] The debriefer then guides the discussion of who the patient is (naming), their story (framing), and the key issues or diagnoses while keeping notes of the discussion on a virtual whiteboard.[37]

Alternatively, screen-based debriefers can project a copy of the worksheets using a screen-sharing screen or by projecting a copy from a second device while typing the conversation. Sometimes, it is advantageous to have a second debriefer who acts as the scribe, while the primary debriefer uses Socratic questioning to elicit the recalled events from the learners. Holding true to the DML process, black ink is used to write down everything the learners say while notating things to be discussed further, green ink is added for good/correct/best choices, red ink is used for wrong/incorrect/not best choices, and blue ink is used for the change in thinking or actions for all discussion points where red has been used.[3,37] Learners are encouraged to add information to their own copy of the worksheet that their peers contribute while the debriefer makes notes for all.

During debriefing, learners are encouraged to keep their microphones on and to freely converse as if they were in a room together. The debriefer can also call on different learners in the group to ensure that everyone is participating. The simulation is then recalled from beginning to end with the debriefer acting as guide and prompt. All learners verbalize assessments, findings, decisions, actions, and subsequent patient responses that occurred during the simulation chronologically.[37] Although each learner may have made different choices based on their interpretation of the events of the simulation, it is still possible to recall as a group since they all experienced the same scenario. Documenting multiple experiences of the same simulation can be challenging, but debriefers should make every attempt to notate the different actions and patient responses.[3]

When the SBS has been completely recalled, the debriefer determines which aspects of the experience will be discussed further. During the next phase of reflection, debriefers use basic and advanced

Socratic questioning to uncover students' thinking, knowing that as findings, decisions, and actions are discussed and further uncovered, both correct and incorrect assumptions and contextual knowledge application are common.[3,40] It is important to consider that learners' taken-for-granted assumptions can be associated with correct or incorrect actions, because some students may choose and demonstrate the correct nursing action but have incorrect reasoning. Debriefers are cautioned that even when the program identifies that the student did the correct thing, it may be for the wrong reason, and it is important to debrief both correct and incorrect actions.[3,37]

The use of different colors on the whiteboard provides a visual reference of the overall clinical experience that goes beyond the feedback from the program which only identified what was done correctly and incorrectly.[3,22,33,37] Without deep discussion, inconsistencies between actions and reasoning may never be identified. Debriefing SBS, however, is not a time to lecture or introduce new knowledge or ideas to learners; it is an opportunity to use Socratic questioning to coach learners to explore the nursing knowledge, skills, and attitudes they used and consider other options for next time. Clinical care of virtual patients is still a complex intersection of observations, decisions, actions, and interactions where learners can synthesize knowledge and demonstrate clinical reasoning.[33]

When the reflection has been completed, everyone turns to the last page of the DML worksheets to summarize the thinking-in-action and thinking-on-action that occurred during the scenario (Table). By setting the experience in the learner's memory with the decisions, actions, and responses now corrected, the next time they need this knowledge, it can inform improved patient care.[41]

The final step of the debriefing is for the debriefer to present a parallel case representing thinking-beyond-action. This parallel case is designed to give the learners an opportunity to anticipate how they might apply what they learned in this simulation to the circumstances associated with another patient in a similar albeit different situation. This is an opportunity to discuss how they would apply their clinical knowledge and any new understandings from thinking-in-action and thinking-on-action using assimilation and accommodation.[3,33,37]

Using the DML Evaluation Scale as a Guide and an Assessment

The DML Evaluation Scale (DMLES) is a rating scale that was developed to be behaviorally anchored in the DML method and process.[42] The DMLES can be used to subjectively or objectively provide a formative assessment of how well debriefers are doing DML.[43,44] It takes time to practice guiding learners in highly abstract thinking processes. Using the DMLES while debriefing can serve as a reminder of each step of the method of DML, particularly to help novice debriefers follow the sequence of naming, framing, recollecting, and reflecting.[43] The DMLES can also be used to evaluate the quality of DML debriefing.[44]

While the current pandemic has created an urgent and rapid need to learn how to use DML, it is important to remember that an evidence-based debriefing derived in theory is a highly sophisticated form of teaching that requires training, practice and assessment.[44,45] In fact, ineffective debriefing skills can have negative results as learners may not recognize their mismatched thinking and actions, which could result in the transfer of misconceptions into nursing practice. Because of the valuable learning that occurs during debriefing, regulatory bodies have recommended that debriefers receive formal debriefing training and that debriefing competence is assessed.[6–8] The DMLES can be used consistently

or intermittently to provide that assessment and determine if there is a need for refresher training. The Table includes some example questions from the DMLES that apply to major concepts and constructs of DML to foster best practice when using this debriefing method.

Conclusion

The transition to SBS has been quick and challenging for many. Ultimately, the goal is to provide nursing students with an alternative to traditional clinical experiences that incorporates enthusiastic instruction and strong pedagogy. Including a synchronous, structured debriefing such as DML ensures that SBS in addition to performance feedback leads to meaningful learning to foster the development of safe and quality patient care.

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