Teaching Healthcare Professionals Using Simulation

HOW TO RECEIVE CREDIT

- Read the enclosed course.
- Complete the questions at the end of the course.
- Return your completed Evaluation to NetCE by mail or fax, or complete online at www.NetCE.com. (If you are a Florida nurse, please return the included Answer Sheet/Evaluation.) Your postmark or facsimile date will be used as your completion date.
- Receive your Certificate(s) of Completion by mail, fax, or email.

Faculty

Jessica Kamerer, EdD, MSN, RNC-NICU, has worked training healthcare providers using simulation methods since 2006. She has experience utilizing simulation in academic and staff development environments. She works with college faculty, residency programs, and hospital educators to develop simulation-based educational programs. Programs range from medical student education in programs such as the family practice residency, nursing and respiratory care programs, to staff development, policy testing, and competency trainings. Her undergraduate degree from Indiana University of Pennsylvania is a Bachelor of Science in Nursing and her Master's degree from Walden University is a Master of Science in Nursing, specializing in education. Her Master's degree capstone project focus was research utilizing simulation to increase the effectiveness of graduate nurse orientation in critical care units. Her Doctorate of Education degree with a concentration in organizational leadership is from Nova Southeastern University. As an expert, Dr. Kamerer provides trainings on learner-centered teaching pedagogies including simulation, as well as consults on development of simulation curriculums, research, and grant writing. Her medical background includes emergency medicine, mental health, and neonatal intensive care. She has a specialist RNC certification as a neonatal intensive care nurse. Dr. Kamerer has been published and presented locally, nationally, and internationally on a variety of topics related to simulation, innovative teaching strategies, and neonatal medicine. She is currently a nursing faculty member and Director of Corporate Programs and Lifetime Learning at Robert Morris University.

Faculty Disclosure

Contributing faculty, Jessica Kamerer, EdD, MSN, RNC-NICU, has disclosed no relevant financial relationship with any product manufacturer or service provider mentioned.

Division Planners

Mary Franks, MSN, APRN, FNP-C
Sharon Cannon, RN, EdD, ANEF

Senior Director of Development and Academic Affairs

Sarah Campbell

Division Planners/Director Disclosure

The division planners and director have disclosed no relevant financial relationship with any product manufacturer or service provider mentioned.

Audience

This course is designed for healthcare educators in the academic and staff development sectors. This includes nursing, medical, and allied health programs. It may also have application to healthcare workers exploring new ways to practice, test, and learn new skills related to their job requirements.

Accreditations & Approvals

JOINTLY ACCREDITED PROVIDER™ INTERPROFESSIONAL CONTINUING EDUCATION

In support of improving patient care, NetCE is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team.

Copyright © 2024 NetCE

A complete Works Cited list begins on page 22.

Mention of commercial products does not indicate endorsement.

Designations of Credit

NetCE designates this continuing education activity for 5 ANCC contact hours.

NetCE designates this continuing education activity for 6 hours for Alabama nurses.

AACN Synergy CERP Category C.

Individual State Nursing Approvals

In addition to states that accept ANCC, NetCE is approved as a provider of continuing education in nursing by: Alabama, Provider #ABNP0353 (valid through 07/29/2025); Arkansas, Provider #50-2405; California, BRN Provider #CEP9784; California, LVN Provider #V10662; California, PT Provider #V10842; District of Columbia, Provider #50-2405; Florida, Provider #50-2405; Georgia, Provider #50-2405; Kentucky, Provider #7-0054 (valid through 12/31/2025); South Carolina, Provider #50-2405; West Virginia, RN and APRN Provider #50-2405.

Special Approvals

This activity is designed to comply with the requirements of California Assembly Bill 241, Implicit Bias.

About the Sponsor

The purpose of NetCE is to provide challenging curricula to assist healthcare professionals to raise their levels of expertise while fulfilling their continuing education requirements, thereby improving the quality of healthcare.

Our contributing faculty members have taken care to ensure that the information and recommendations are accurate and compatible with the standards generally accepted at the time of publication. The publisher disclaims any liability, loss or damage incurred as a consequence, directly or indirectly, of the use and application of any of the contents. Participants are cautioned about the potential risk of using limited knowledge when integrating new techniques into practice.

Disclosure Statement

It is the policy of NetCE not to accept commercial support. Furthermore, commercial interests are prohibited from distributing or providing access to this activity to learners.

Course Objective

The purpose of this course is to provide healthcare educators with the information necessary to design and implement a simulation curriculum to create a rewarding, effective, and interactive learning environment for participants. These sessions will lead to greater skill retention, safer practitioners, and increased confidence and competence in healthcare workers.

Learning Objectives

Upon completion of this course, you should be able to:

1. Describe the adaption of the history of simulation use into the healthcare industry.
2. Name applications of simulation as a healthcare learning tool.
3. Identify how to use learning domains when creating a simulation learning scenario.
4. Apply simulation learning activities to specific student population educational needs.
5. Identify components of planning a debriefing session.
6. Describe the role of the educator in a debriefing session.
7. Outline tips for a successful debriefing session.

INTRODUCTION

Simulation is not a new concept in education. In its earliest uses, it was role-playing or skill demonstration on models. Many nurses gave their first intramuscular injections on oranges. Though low-tech versions, they were still a type of simulation. Great educators know that learner-centered education is a key component of student engagement and knowledge retention. When coupled with an immersive learning environment in which students can practice hands-on learning, it is a recipe for success. Simulation learning has come to have many definitions. This course explores the history of simulation use, current uses of simulation, how to use simulation as a learning tool, effectively creating a simulation scenario to meet educational goals, and proper debriefing tactics for simulation educational sessions.

SCOPE OF SIMULATION USE

The National Council of State Boards of Nursing (NCSBN) defines clinical simulation as, "an activity or event replicating clinical practice using scenarios, high-fidelity manikins, medium-fidelity manikins, standardized patients, role-playing, skills stations, and computer-based critical thinking simulations" [1]. Simulation is a teaching practice and a tool, not just a technology. With any educational practice or tool, a good educator will start with the content to be taught and then determine which technologies will best enable learning [2;50]. For medical education students, simulation often is the best technology to utilize given that it allows realistic and immediate feedback for participants without risking patient harm.

Simulation is growing in popularity in nursing and healthcare educational systems across the country. A 2016 study indicated that among nursing programs across the United States, 91% were using simulation in their curriculum [46]. Since the COVID-19 pandemic, simulation has advanced in response to the adaptations needed during that period [48]. The benefits of simulation are widely accepted, as it offers the opportunity to practice repeatedly and safely [4]. Its use is driven by the demand for educated healthcare professionals resulting from the growing national nursing shortage, the need to practice skills without harming live patients, and the increasing ease of its usage and availability. Competition by healthcare schools nationwide for clinical sites has resulted in the use of simulation as a model for clinical supplementation. The technology is popular among the technologically savvy younger generations and is appreciated by others. Simulation can be used for teaching new skills, testing competency, and improving team dynamics. It offers a unique, controlled, learner-focused educational environment that can mimic real-life situations and experiences. A 2014 NCSBN study showed that replacing up to 50% of clinical hours with simulation in prelicensure nursing education achieved comparable student outcomes (e.g., clinical competency, pass rates) to traditional clinical experiences in nursing education (i.e., simulation used in less than 10% of clinical hours) [43].

Virtual simulations (i.e., video game-like interactive computer programs) have now grown in popularity, with 65% of nursing programs using virtual simulation according to a 2016 national survey [44]. Although this technology will undoubtedly become nearly ubiquitous in the future, it remains to be proven to what extent virtual simulation can replace clinical hours or live simulation. One provider of virtual simulation claims that their products improve clinical competency, content knowledge, critical thinking, and self-confidence equivalent to traditional live-action simulation [45]. Those who have studied the effectiveness of virtual simulation

seem to concur. They emphasize that this technology may be able to imitate real-world, high-risk scenarios better than clinical hours because the intensity of life-and-death scenarios can be played out fully in virtual reality, and the low cost of virtual simulation may provide a more widespread opportunity for nursing students to think critically and build confidence.

Being used by nurse educators, faculty, and residency programs, simulation is a valuable learning tool that appeals to visual, kinesthetic, and auditory learners. Simulation is considered a more interactive learning strategy than traditional lecture methods [5]. Few other teaching modalities can claim this, and students often learn well in these educational experiences. There are a variety of simulation tools that can be employed to present exceptional educational experiences.

HISTORY OF SIMULATION

Simulation had been adopted in many professions before it took hold in health care. The most well-known early use of simulation was by the aviation industry. It was instituted in pilot training beginning in the 1970s after recognition of the devastation human error in this context could bring to the public [6; 7]. The impetus for this change was the sentinel event of the tragic airport disaster in 1977 at Tenerife in the Canary Islands. This well-publicized aviation incident was the result of a breakdown in communication and flight crew errors that led to two Boeing 747 passenger crafts colliding on the runway, killing 583 passengers. It remains to this day the deadliest aviation accident in history. The incident received worldwide attention, and the airline ultimately claimed responsibility, paying millions in restitution to victims' families. Still used in a variety of trainings today, re-enactment videos and hundreds of articles regarding the incident have been published. In 1979, investigators for the National Transportation Safety Board reported that at the time, human error was the cause of 60% to 80% of aviation accidents [6]. In the 1990s, Crew Resource Management programs blossomed and are still widely used today [7; 52]. These programs focused on interdisciplinary communication, team building, and simulation of crisis events to improve flight crew performance and lessen aviation errors that could potentially lead to civilian deaths or injuries [8;51].

The U.S. military also adopted the use of simulation as an effective means of training soldiers. Simulation is still used today for military medical personnel to teach or maintain skills for a variety of tasks, but most notably for high-acuity, low-circumstance situations. However, its use is not just health care related; simulation has been used for years in the military to teach everything from gun safety to military strategy with war games. The military uses a variety of simulation modalities, creating some of the most advanced virtual simulations and computer learning in the world. This is important, as simulation should mimic reality as much as possible to foster experiential learning in a realistic environment [9; 5]. Although it is a very useful tool, the military also realizes there is only so much one can learn from electronic means. Some skills require tactile and psychomotor practice to perfect what a virtual world cannot replicate.

With the increase of military reserve unit personnel in the last few decades, advanced medical simulation exercises have been utilized to maintain skills when not participating in active duty. Some military units will even partner with civilian simulation centers to provide training if their resources are scarce or unavailable [10]. Using simulation to maintain the skills of reserve military members while they are not on active duty ensures they will be prepared if called into active duty. An underprepared medic is of no use to anyone in battle, during which skills can often mean the difference between life and death.

Many industries have found uses for simulation to increase productivity and even sales. One of the most famous innovators of simulation was Walt Disney, who strongly believed in the need to simulate to be innovative , even from the start of his career [11].

Although aviation and military industries have been using simulation for decades, medical schools have also adopted its use, and nursing and other allied healthcare schools have followed [12]. As the technology has grown to meet the needs of medical industries and become more cost-effective, user-friendly, and realistic, it has come to be very common to see schools and hospitals using simulation to train healthcare professionals. Publicity has also brought simulation equipment to the masses. Potential healthcare students consider universities' and colleges' available simulation equipment when choosing a school. Today's learners live in a technology-rich environment, and today's healthcare market demands the use of technology in their training. Educators must meet these demands by learning to integrate this technology into their practice.

Technology is used by students in their everyday life. Even if students can text and search the Internet, they may not be prepared for the types of technology they will be expected to use when they graduate. Computerized charting, point-of-care information capturing devices, monitors, smart pumps, and accessing or viewing online medical test results are just some of the things they will be expected to do. Simulation may be used as an approach to bring these students up to par when they enter the workforce [5; 13; 53]. Traditional case studies, reading assignments, and course lectures can only take students so far; educators must adapt their practices to address these modern needs.

Training and education in healthcare professions can be flexible; it can be easily adapted to meet the needs of the learners and improve performance either for the school or organization [5; 14; 54]. Simulation was originally considered a way to teach skills to medical students. As technology and teaching methods have grown, its uses have also grown. It is now used to teach and develop procedures, develop critical thinking, crisis training, multidisciplinary team development, and communication skills. With mannequins so advanced they can react to medications, blink, bleed, talk, and respond to interventions, educators are beginning to question whether it is ethical to teach students on living patients. Interest in simulation-based education has also been heightened in risk management departments, where the use of simulation to train staff is touted as both a cost-saving and life-saving tool. The benefits of simulation can be difficult to identify because they are hard to assess. Instead of direct outcomes, more vague influences may need to be observed, such as increased effectiveness of health care and reduced medical errors [5; 15;51;54].

Today, there are many forms of simulation. The most well-known simulation tool is the human patient simulator, a full-body mannequin model that may have various levels of technology. The technology is classified as fidelity, with ranges on a continuum from low to high according to the degree to which they most closely represent reality [5; 16;55]. There are also task trainers, virtual or flat-screen simulations, also known as screen-based simulation, and standardized patients. However, as the most popular form of healthcare simulation, the human patient simulator will be the focus of this course.

APPLICATIONS

Innovation and simulation have found their place in various arenas in the healthcare realm. Simulation activities focus on active learning, with the purpose of building learner confidence and enhancing clinical judgment [5; 17;51]. Simulation provides a setting in which mistakes can be made without the repercussions of patient harm that may occur in real time [49]. The ultimate goal of the educator when using simulation should be to create a learner-centered educational experience to foster optimal educational outcomes. Simulation-based education has a wide variety of applications in health care, including academics, staff development, competency maintenance, and team development.

ACADEMICS

When used as a teaching method and not just a piece of technology, simulation can be invaluable in educating students. It is difficult to use simulation to replace physical contact with live patients, but it can make student and faculty time in actual clinical environments more valuable and cost-effective [1]. It creates a learner-centered environment whereby students can take on the role of the healthcare provider, allowing students an avenue to practice skills within their potential scope of practice (instead of under the limitations of a student). Students can face situations they will need to manage as new practitioners in an environment where they can make mistakes and see the consequences without risking patient harm [18; 46]. When taught in the hospital setting, students must function as students, with limited scope and responsibilities. When used in a lab, simulation allows students to act out scenarios to learn about specific procedures and case presentations.

Creating realistic, student-driven simulations can increase critical-thinking skills and knowledge retention. However, these scenarios can prove difficult for educators who are more accustomed to teacher-centered, traditional, lecture-style instructional methods [19; 56]. However, when used as an immersive learning environment, simulation scenarios require minimal faculty involvement limited to facilitation. In these scenarios, students are provided the opportunity to link didactic material to the clinical environment without the fear or anxiety of possibly inflicting patient harm. Students also have the luxury of having instant feedback on their interventions and actions.

When used as an adjunct to traditional lecture courses, simulation can keep students engaged in the classroom. Bringing a mannequin to the classroom can bring case studies to life, providing a means for demonstrating procedures, physiologic responses, or case presentations. For example, instead of having students read and listen to a lecture about bacterial meningitis, a hands-on option could be added. A simulation exercise coupled with this lecture content could show students the characteristic rash, how the acute illness can rapidly progress if untreated, and a demonstration of positioning for a lumbar puncture procedure or possibly even intubation for airway management. Instead of appealing to one type of learner (the auditory style), the lesson would also engage the active and visual learners to make a richer learning experience for everyone.

Simulation can also be used as a supplement for clinical experiences. With student enrollments increasing to meet the demands of projected shortages, clinical site competition between schools is growing, making it difficult for faculty to provide everyday clinical experience for students. Days with a dearth of patients, surgeries, or experiences do occur, most commonly in specialty areas like pediatrics or maternity. Simulation can be a solution to these situations, allowing for a productive use of resources instead of wasted down time.

Simulation may also be a way for clinical instructors to evaluate the level of performance of their students. Often, instructors can only be with one student at a time, running from one student to the next to pass medications, help interpret charts, answer questions, and possibly assist with procedures. Simulation allows instructors to work with and evaluate multiple students instead of only one at a time.

Watching students during a simulation exercise can provide a wealth of knowledge to educators. They can see which of their students understand the content, which students need practice with communication skills, which can step up to the leadership role, and which need remediation. This is the ultimate tool for students who have not previously had patient contact. Educators can evaluate students in a standardized environment. For example, students may be assessed on their ability to perform a pediatric physical assessment without the participation of parents, an uncooperative child, or clinical area activity (i.e., distractions), unless the instructor designs these factors into the experience.

STAFF DEVELOPMENT

Educators in staff development are also increasing the use of simulation as a means of working with licensed healthcare professionals. From physicians in residency programs to graduate nurses, the flexibility and personalization of this teaching modality appeal to most everyone. The most commonly used application in this area is for training purposes, to teach new skills, or reinforce previously learned ones. The skills can be task-focused for beginner-level learners, and complexity can be increased with the level of knowledge of the learner. For example, the instructor may be interested in teaching staff how to perform a breast exam on female patients. This very personal task is objectively simple to perform, but it can be intimidating to students due to the importance of doing it right to detect breast cancer and the intimate nature of the patient contact. The students can be presented with the methods used and then given breast exam task trainer models on which to practice. When they can demonstrate proper completion of the breast exam on the models, a level of complexity can be added. The task trainer can next be applied to a person or a mannequin. This adds a more personal element and can help students overcome the social anxiety that may be associated with the exam. Students would have to also practice communication skills when interacting with the "patient" as well. For the most advanced students, the model could even contain a lump, which would then require the student to deliver bad news and treatment options to the patient. Tying the emotional aspect to the clinical knowledge in these exercises creates a memorable learning experience and can help with knowledge retention and transference into clinical practice.

Remediation is another application for staff development. There are times when staff require additional practice or another chance to catch on to a procedure, skill, or task. Simulation can be a way to put individuals in a safe learning environment, so remediation can be most effective. Instead of capitalizing on those negative thoughts and singling a staff member out to demonstrate a specific skill, simulation can be used to put them into a clinical setting and recreate their comfort zone, helping them to relax and perform at their optimal level.

EVALUATION METHODS

Simulation as an evaluation method can be used in many facets of healthcare education. The value of using simulation for evaluation is being increasingly appreciated, as traditional methods of testing (such as observation and oral exams) are limited in their ability to distinguish between adequate and inadequate clinical performance [20;57]. For example, the Objective Structured Clinical Examination (OSCE) medical and nurse practitioner students pass to obtain licensure is incorporating more simulation in place of real patients. OSCEs may even have a place in other health profession's licensing exams in the future.

On a simpler scale, simulation can be used for individual courses. It provides a unique opportunity for instructors to create a clinical environment conducive to testing without the variability of real-life circumstances. Simulation can be used as a tool to test simple skills such as Foley catheter insertion or more complex concepts such as shift reports or hand-off communication.

However, using simulation as an evaluation method is not without its downside. There is a risk that using simulation this way will ruin the safe learning environment created for education. It is important to be upfront with learners about the goals of the experience. When students know what is expected of them, they can feel prepared and act accordingly. When they come with one expectation (the experience is for learning) and are asked to complete another (an examination), they may feel that they were not informed or allowed the opportunity to be prepared. In addition, the technology can be distracting for some learners, who may focus entirely on the mode of simulation and ignore the patient.

COMPETENCY MAINTENANCE AND TESTING

Many professionals complete tests to validate their level of performance and to continue clinical practice. This can be specialty-specific skills, such as how to work certain equipment or complete certain documentation methods, or it can be a renewal of certifications required to work, such as advanced cardiac life support (ACLS), pediatric advanced life support (PALS), or neonatal resuscitation. Whatever they may be, organizations are required to show their staff have displayed the skills necessary to safely practice.

The traditional method of evaluating these designated competencies is skill demonstration stations. Using this model, staff demonstrate their designated requirements to a validator, who would then sign them off to the organization as safe to continue to practice. This can be time-consuming and labor-intensive and is not the most effective means of completing competency validation. Staff usually also have the option of being signed off on the skill when performing patient care, but this can be dangerous and may take unnecessary risks.

Simulation can be used in place of or in conjunction with demonstration stations to help evaluate staff and develop professional knowledge, skills, and attitudes while protecting patients [21;49]. Creating a simulation that incorporates the essential elements of competency can be a more effective means of testing. Small teams could participate and be evaluated, and teams could include various disciplines. This would allow individual skills to be tested, as required, and would promote team building and communication skills.

TEAM DEVELOPMENT

Using simulation for team training shows promise in impacting knowledge, attitudes, and behaviors of a team's skills [22; 58]. The goal is to produce efficient healthcare teams that optimize the use of people, resources, and communication to create a safer care environment for patients. In aviation, these team-building simulations were called crew resource management; the adaptation in health care is commonly termed crisis resource management (CRM).

CRM has become a training methodology to develop healthcare professionals who can efficiently work within a team to perform in high-stress, life-threatening situations by applying concepts of leadership, communication, assertiveness, decision-making, and team performance [23;59]. Emphasis in CRM courses is placed on behavioral skills, such as communication, leadership, and situational awareness [24;59;60]. Within healthcare organizations, professionals have often become accustomed to working in silos; nurses work well with nurses, respiratory therapists work well with respiratory therapists, and physicians work well with physicians. When members of these various disciplines are pulled together, it can be confusing to determine who takes the lead, how to communicate effectively, or

how to understand each other's scope of practice. Problems in the interdisciplinary team are enough of a problem when they happen during a less risky task, such as transporting a patient to a new room. However, when team breakdown and communication difficulties occur in an ad hoc crisis group, such as a cardiac arrest team, this disconnect can lead to sentinel events and poor patient outcomes. CRM is geared to address these concerns.

Most CRM trainings consist of different parts. The first is a didactic portion that covers the background and principles of CRM. Then, there is trainee participation in a simulation scenario, whereby they manage a crisis event. This is followed by a debriefing of all the participants, during which a critical analysis of the simulation event and self-reflection of their performance is completed, often utilizing video debriefing [23;59]. The participants should be multidisciplinary, including for example, nurses, physicians, and respiratory therapists. Having representatives from various disciplines fosters collaboration, understanding, and communication among the team.

To properly facilitate better communication, some healthcare organizations have adopted the SBAR technique for communicating information among healthcare professionals of various disciplines. The acronym SBAR refers to four steps in effective conveyance of patient information [42]:

- Situation: Identify oneself, the patient, and the current problem
- Background: Relay pertinent background information
- Assessment: Clearly describe the current assessment of the situation
- Recommendation: Outline any recommendations for safe and appropriate care

Simulation scenarios may be used to gauge a team's communication techniques and adherence to the SBAR standard.

Derivatives of CRM and SBAR courses have been created for team training. The Agency for Healthcare Research and Quality has established the TeamSTEPPS program, a three-phase teamwork system that is evidence-based and aimed at improving patient safety by improving communication and teamwork skills among healthcare professionals [25]. Other trainings exist, but the basis is the same: improve patient safety by teaching healthcare professionals how to work effectively in a team.

CREATING A SIMULATION SCENARIO

Producing an effective learning environment with technology is a challenge [26; 51]. A 2010 study by Hayden reports that among 1,060 nursing school respondents, 78% of faculty members surveyed needed to write their own simulation scenarios, but of those, only 30% had received any training on how to do so [3]. Evidence suggests that training for educators on simulation remains inadequate. Furthermore, limited resources are available to enhance the educator's ability to develop simulation scenarios [51]. For many just starting to use simulation, the most difficult step is getting started. Many companies and even some textbook publishers are beginning to sell prepackaged simulation scenarios with varying levels of complexity. These can be convenient to use, but as educators start to do more teaching with simulation, these generic, premade scenarios are not likely to meet all their needs.

As a response to the growing use of simulation in healthcare, the International Nursing Association for Clinical Simulation and Learning (INACSL) was founded in 2003 and now has more than 2,500 members worldwide. The INACSL maintains and continually updates (most recently in 2021) their Standards of Best Practice for Simulation, which is intended to assist in the creation and analysis of effectiveness for simulations in nursing. Eleven criteria have been identified as essential in creating simulation-based experiences that are purposefully

designed to meet identified objectives and optimize the achievement of expected outcomes [47]. These 11 standards consist of best practices in the areas of professional development, prebriefing, simulation design, facilitation, debriefing process, operations, outcomes and objectives, professional integrity, simulation-enhanced interprofessional education, and evaluation of learning and performance [71]. Highlights include [47]:

- Perform a needs assessment to provide foundational evidence of the need for a well-designed simulation-based experience.
- Construct measurable objectives.
- Structure the format of a simulation based on the purpose, theory, and modality for the simulation-based experience.
- Design a scenario or case to provide the context for the simulation-based experience.
- Use various types of fidelity to create the required perception of realism.
- Maintain a facilitative approach that is participant-centered and driven by the objectives, participant's knowledge or level of experience, and the expected outcomes.
- Begin simulation-based experiences with a prebriefing.
- Follow simulation-based experiences with a debriefing and/or feedback session.
- Include an evaluation of the participant(s), the facilitator(s), the simulation-based experience, the facility, and the support team.
- Provide preparation materials and resources to promote participants' ability to meet identified objectives and achieve the expected outcomes of the simulation-based experience.
- Pilot test simulation-based experiences before full implementation.

This section will discuss factors educators should consider when creating their own learning experiences with a simulation scenario.

GOALS

The very first step when creating a simulation scenario is to establish the educational goals of the session. These goals will determine the complexity and the type of scenario that should be created. For example, is the goal for the students to practice taking vital signs while distracted by patient questioning, or is it to know when to call a physician for orders? Maybe the goal is more complex, such as teaching how to prioritize patient care needs or to develop and utilize critical-thinking skills. After the goals are defined, then the scenario can be formulated.

RESOURCES

When the goals have been set, the topic or content to be covered must be selected. This can be overwhelming if a large amount of content is being taught. Most often, the content of a simulation stems from a disease process. For example, the simulation content might be on postpartum hemorrhage, exacerbation of congestive heart failure, or care of a pediatric patient with an asthma attack. There may be an abundance of resources available when choosing a simulation topic, but they may need to be looked at from a new perspective. Possible resources include case studies, real experiences, course content students seem to struggle with understanding, test scores, or exam blueprints.

Many healthcare teachers already rely on case studies to teach content, and these can be adapted easily into a simulation. Consider using a simulator to show physiologic changes instead of having students read about them. Use test scores to identify students' weak areas or topics that require supplemental instruction; students may historically seem to have trouble comprehending a certain set of material. This material can be provided in a simulation activity that will appeal to more learning styles and possibly close the gap between comprehending the didactic material and applying it to a clinical situation or the gap between classroom instruction and the unpredictability of clinical areas [27;54;54].

WRITING OBJECTIVES

When goals have been set and content chosen, it is then time to create measurable objectives. It is vitally important to write clear, specific, and measurable objectives, as successful simulations rely on carefully planned scenarios with clear learning goals and objectives [28]. Objectives will guide the instructors and the participants. This is a great time to determine if the simulation is going to be used for learning, remediation, or educational purposes. As discussed, being upfront about the purpose of the session will keep students on task, focused, and in a learning-centered consciousness while participating.

Clear objectives are also very important if the person writing the scenario will be different than the person running it. For example, some institutions have faculty who write a scenario for a course, and the learning activity will be used by all students and taught by other clinical instructors. To maintain as much consistency as possible for the students between the clinical groups, the objectives must be clear and specific, so all faculty and participants are held to the same standards.

Learning objectives should also have a time frame. They should specify if learners are expected to meet the target(s) during the simulation scenario, before arriving for the simulation activity, or in the debriefing session afterwards. Objectives should also be specific. If students are expected to complete a cardiac assessment, explain what that means. Is it expected they listen to heart sounds in all fields, attach the patient to a monitor and interpret their electrocardiogram rhythm, and/or obtain a history of all related illnesses and medications? Definitions may vary among faculty members, so being specific will clarify discrepancies. Lastly, make sure the objectives are measurable. These are all important things to be considered; examples of properly written learning objectives will be provided later in this course.

APPLYING LEARNING DOMAINS

Learning occurs best when it can be applied to multiple learning domains. The affective, cognitive, and psychomotor learning domains are important because they address the types and styles of learning among students. The affective domain applies to attitudes, beliefs, values, feelings, and emotions. Learning in this domain occurs when students relate their feelings or emotions to the content they are learning. Many faculty members find it difficult to address this domain when instructing, as traditional, faculty-centered education for large numbers of students often does not directly relate to feelings, emotions, or values. The cognitive domain includes knowledge, comprehension, application, analysis, synthesis, and evaluation. Conventional lecture-style courses typically apply to the cognitive domain, as their purpose is to transfer knowledge from the professor to the students. Finally, the psychomotor domain relates to motor skills, including both gross and fine. It encompasses the physical doing of things or the demonstration of skills [29]. Demonstration requires the student to perform or physically do the skill in the objective directed to address the psychomotor domain. For example, teaching a child to tie his or her shoelaces is a type of psychomotor learning. Examples of objectives as they apply to each of the learning domains include:

- Cognitive: Students will correctly prioritize physician orders and patient care for completion. This includes when to complete an assessment, contact the physician, and organize orders for completion by priority.
- Affective: Students will actively discuss their feelings and concerns about the simulation experience in a debriefing session related to knowledge application, physiology, and medication administration.
- Psychomotor: Students will correctly demonstrate how to insert a Foley catheter while maintaining sterile technique in the simulation exercise.

The verbs of each objective are directly related to the associated learning domain.

Students who learn best in the cognitive domain may not comprehend material when it is only addressed in the psychomotor format. This is important to consider when designing any learning session ensuring domains are used to help multiple learners increase their comprehension. The simulation modality can appeal to all three learning domains. Students must recall knowledge (cognitive) to perform the appropriate interventions to care for a patient (psychomotor) that will then be discussed in the debriefing session (affective).

CREATING CONTENT

The next step in creating a simulation scenario is to write the content. An easy method to begin is the creation of an outline. The major headings of the outline should answer the following questions:

- How should students find the scenario?
- What stages should the scenario proceed through?
- What should happen if students do things correctly or incorrectly?
- How will the scenario end?

This outline will tell the person managing the simulation how it should be set up (I), how the simulator should be programmed (II), how they should adjust simulator settings based on the student performance (III), and when to end the session (IV).

There are simulation scenario templates available from publishers and organizations and in the literature. For example, the National League for Nursing's (NLN's) Simulation Innovation Resource Center (SIRC) has free, downloadable templates available on its website (https://www.nln.org/education/education/sirc/sirc/sirc). Exploring these templates may be helpful in finding a format that is easiest to understand, adapt, and work from when managing and writing scenarios. The templates often include areas to create supportive documents and information for students, such as physician orders or test results.

Create the Environment

Setting up the simulation will determine how students will find the simulator when they arrive. For example, if the session is about a patient who falls at home, the students might find the simulator dressed in street clothes on the floor. Or if the scenario is about an intensive care unit (ICU) patient who is having an acute myocardial infarction, the simulator should be dressed in a hospital gown, lying in a hospital bed, attached to a monitor, in a room set up to look like it is in an ICU. How the simulation is prepared will provide clues to the participants as to how to get started and the guidelines they are expected to apply. If they are acting as home care nurses for the first example, they will have different resources and skills than the nurses in the second scenario caring for the ICU patient. Establishing the scenario also includes creating the patient history and determining how it will be relayed to participants. A report could be given verbally, or a faux patient chart could be created and placed in the room for review.

In addition to creating the simulation environment, educators should plan how learners will be prepared to participate. A prebriefing is defined by the INACSL as a process that involves preparation and briefing that occurs before students participate in simulation-based learning [71]. Educators should share the background for the case, learner expectations, and any relevant rules. The prebrief should focus on helping the participants feel prepared and psychologically safe and should tie the purpose and content of the case to learning objectives for the simulated learning experience [72].

Identify Stages

Next, it is important to determine the stages of the simulation according to the progression of the illness for the case; this is usually done by following the normal presentation of the disease on which the scenario is based. Each time there is a change in the patient status, a new section of the outline should begin, and these sections will become stages for the scenario. Each stage should include assessment findings, such as lung, heart, and bowel sounds.

For example, a scenario about a patient having a myocardial infarction could include three basic stages: presentation, worsening of symptoms needing intervention, and recovery after proper interventions have been instituted. The vital signs should be listed for each change in status/stage as well. It is also helpful to list the interventions students are expected to complete and how much time should be spent on each stage.

Reactivity

The third part consists of reacting to the student's performance. A good amount of improvising will be necessary while managing the scenario, but it is vital to plan ahead as much as possible when writing a simulation. The simulator should know how to react if the students do what is expected or if they do not perform as intended. The simulator should "respond" to the participants' interventions by changes in vital signs or by giving verbal feedback to the patient. Consider using the simulator as a cuing mechanism to guide students as well. For example, if the expected behavior is to apply oxygen to the patient but the students are not doing so, oxygen saturation may decline in response to their lack of intervention and/or the patient may complain of increasing shortness of breath. Other signals that can be worked in are calls or visits from "ancillary staff" (actors/faculty members pretending to be healthcare team members) to cue students. For example, if a scenario requires students to interpret lab results before they progress, someone could call in as the physician and ask for a patient status update, including the lab findings. This would trigger students to interpret the lab test(s) without the faculty having to interrupt the learning process.

Wrap Up

The final part of writing a scenario outline is to consider how the scenario should end. Wrapping up the simulation is important, and how it is completed matters to learners. It can be worked into the exercise or stopped when notification is given by the instructor running the activity. If it is worked into the exercise, make sure it is clear the point is to end the simulation. For example, if the end of the scenario is just when all the expected interventions have been completed, participants will not know when to end; because they are not privileged to know what all the expected behaviors are, they will keep performing until informed to stop. An alternative is to make the case end in a way that is conducive to real life, such as needing to perform a handoff report to the next shift via hand-off communication or the patient transporter arrives to take the simulator to an ordered test or for a procedure. Either verbally telling or working the end of the scenario into the simulation is acceptable, as long as it is clear when the activity is to be concluded.

Evaluation of Appropriateness and Realism

It is very important when creating a simulation curriculum to consider if the scenario is appropriate. This includes making sure the activity meets the needs of the learners and is at a level at which they can be successful when they participate. Questions to consider are: Does it fit the level of the student? Does it need to be simplified? Does it need to be more difficult? Does it need more subtle or obvious cues? Remember the learning goals and objectives and relate them to the student population. It is easy to get carried away and want to include many things in the scenario. This can lead to making the simulation too complex or the objectives unachievable. Remember the time frame of the scenario and only include an attainable amount of items that can be completed.

The level of the learner should dictate the complexity of the experience. Scenarios should address the learning objectives, but also be written to the level of the learner [30;61]. If participants are first-year nursing students, the scenario must contain more basic concepts, with many or obvious cues. For more experienced learners, such as for a staff development course, the concepts should be more complex, with subtle cues to invoke communication and foster critical thinking among participants. Distracters can also be used for higher-level students. Distracters refer to items worked into the scenario that students must manage to be successful. For example, a radio could be playing loudly, and students would be expected to manage the noise (turning the radio down or off) so communication is clearly heard and understood between participants.

It can be very beneficial to consider having peers review a new scenario before implementing it. They can offer advice regarding whether the simulation meets the objectives, is appropriate to the learners' skill level, and can be understood or requires clarification.

After a simulation is written, it should be evaluated for "realness." The overall goal of using simulation is to provide a realistic, safe learning environment for healthcare students to practice their skills. When creating the experience, consider how to make it more realistic for participants. Using props is one way to add realism, and this can include things like a patient chart, an identification band, and patient belongings in the room. Having the students call a person to get needed services, results, or equipment is also more realistic. Giving them a live person to talk to, instead of just requesting items and having them arrive, forces students to communicate professionally and allows them to experience the importance of being clear about their requests to get what they need. Giving the simulator a voice also adds a level of realism to the case. Learners may find it awkward at first to talk directly to a plastic mannequin, but as they get involved and the mannequin answers back, it gets easier.

The experiential learning aspect of simulation calls for participants to understand that their actions have reactions. There must be a correlation between how they perform in the scenario and how the patient responds for proper learning to occur. A suitable way to achieve this is to have the simulator's vital signs or status change based on how the students perform. When a role-playing nurse administers nitroglycerine, the myocardial infarction patient should voice some relief from pain and his or her blood pressure should improve. If it is what is expected to happen in real life, the student should experience it in the simulation.

Moulage is also an excellent way to add realism to a scenario. Moulage refers to the application of makeup or decals to create mock versions of diseases or injuries in simulations. An example could be creating a necrotic pressure ulcer on the sacrum of a bed-ridden patient. Moulage can also utilize props, room set-up, or faux body fluids to simulate diseases. This can create a sense of realism for the activity and help to suspend the disbelief of the participants. Moulage should be added to scenarios whenever possible and kept in the context of the learning exercise. If it is used too much, however, it can be more of a distraction than a help to students. It is also important to investigate what materials are safe to be used on simulators before being applied, as many mannequins and models have skin that is easily stainable.

SCENARIO OUTLINE EXAMPLE

The following is an example of an outline for a simulated learning experience. The case is designed for nursing students learning how to manage a patient during a postpartum hemorrhage.

Title: Postpartum Hemorrhage Simulation

I. How should students find the scenario?

   A. Room: Postpartum care unit room

   B. Simulator: Female, in a hospital gown with fundus module on the abdomen

   C. Moulage: Approximately 500 cc of faux blood on the dressing (e.g., Peri-Pad), underwear, and bed sheets

   D. History: Patient J is a woman, 23 years of age, gravida 1 para 1, 2 hours status post spontaneous vaginal delivery of male weighing 9 lbs 7 oz, with no significant past medical history.

II. What stages should the scenario proceed through?

A. Stage 1: Initial presentation

1. Vital signs: Heart rate 100 beats per minute, blood pressure 92/60 mm Hg, respirations 22 breaths per minute
2. Assessment: Patient anxious, diaphoretic, and uncomfortable. Fundus boggy on palpation. Complains of feeling "wet."
3. Expected interventions: Complete assessment, contact the healthcare provider to report a patient status change and obtain orders for treatment
4. Time frame: 10 minutes

B. Stage 2: Progressing hemorrhage

1. Vital signs: Heart rate 130 beats per minute, blood pressure 84/50 mm Hg, respirations 28 breaths per minute
2. Assessment: The patient becomes disoriented and has difficulty breathing.
3. Expected interventions: Implement healthcare provider's orders:
   - Perform continuous fundal massage
   - Administer 500 mL normal saline solution with 30 Units of oxytocin IV to run at 150 mL/hour
   - Give methylergonovine 0.2 mg IM injection
   - Administer oxygen via nasal cannula at 2 liters
   - Obtain a complete blood cell count, type, and screen
   - Administer misoprostol 600 mcg rectally
4. Time frame: 10 minutes

C. Stage 3: Stabilization and recovery after orders implemented

1. Vital signs: Heart rate 90 beats per minute, blood pressure 104/60 mm Hg, respirations 18 breaths per minute
2. Assessment: Fundus becomes firm; patient's breathing and vital signs stabilize.
3. Expected interventions: Monitor patient until stable.
4. Time frame: 10 minutes

III. What should happen if students do things correctly or incorrectly?

A. Stage 1: If done correctly, progress to stage 2. If done incorrectly, have the patient's vital signs decline and the patient complains more of being anxious, dizzy, and very wet.

B. Stage 2: If done correctly, progress to stage 3. If done incorrectly, the patient will become unresponsive until interventions are initiated.

C. Stage 3: If done correctly, end simulation. If done incorrectly, have the patient question about their blood pressure and bleeding until the patient is assessed.

IV. How will the scenario end?

A. Option 1: Verbally tell participants that the simulation has ended.

B. Option 2: Have the physician arrive and request an update on the patient. After the update is given, inform participants their shift is over.

DEBRIEFING A SIMULATION SCENARIO

A major part of using simulation as an educational practice is the responsibility to follow up with the debriefing phase of the exercise [31; 47]. Debriefing is a meeting time after a simulation learning exercise for students and instructors to reflect on actions, outcomes, and critical-thinking processes that occurred in the learning process. Debriefing allows the team to re-examine the encounter to develop clinical reasoning, judgment, communication, and critical-thinking skills in a reflective learning process [32; 47]. It is an important part of the learning process and should be taken seriously. It allows learners time to process their feelings and experiences during the scenario and to reflect on what they have learned [33;62]. Debriefing, when learned and implemented, can be helpful for educators in other realms as well, such as the clinical unit. Instructor feedback and student reflection are vital components of these sessions, which close the loop of learning during a simulation and ensure proper student learning. The goal of debriefing is simple to state: to help learners gain new knowledge, skills, and attitudes. However, this may be difficult to implement.

During a debriefing session, many things should occur. Instructors should act as facilitators of discussion and cover teaching points related to achieving the learning objectives. It is a time to facilitate the critical-thinking process and correct any misconceptions the participants may have formulated during the simulation experience. It is the best time to help students find connections between their actions and the patient's reactions. These connections and implementation of critical thinking are what make debriefing the most likely time when the whole experience will "make sense" to participants [34; 47].

During the activity, learners are often very focused on performance and may lose sight of the bigger picture. In debriefing, this is all brought together, allowing learners to examine all the events and how they fit together.

Debriefing immediately after a simulation has been shown to enhance learning [33; 47]. There are methods of debriefing that will create an active discussion and enhance learning, but these often take training and practice to achieve. Improper techniques can leave participants feeling vulnerable or defensive, which can severely hinder the learning process.

The origins of debriefing after simulation are rooted in various fields and practices. The military and aviation industries have been using it for years as part of their respective programs. It is involved in planning and briefing measures for soldiers and during strategic planning. It is often a standard practice to have debriefing, for example, of soldiers in an after-action review when they return from active duty missions.

The aviation industry utilizes debriefing in pre-flight and post-flight reviews for crew communication. It became required of those involved in incidents in response to crashes beginning in the 1970s as a way to identify causes and actions leading to sentinel events.

Principles of psychology play a large role in debriefing techniques. These sessions must allow participants to process their feelings to effectively address the learning concepts being covered. It can be difficult for learners to think when they are flooded with emotion. If emotions are not addressed properly, then the educator should not expect learning to occur, as participants will be unable to participate in reflection and discovery during the session.

COMPONENTS OF A DEBRIEFING SESSION

The concept of success for a debriefing session should begin before the simulation experience. The first component of a debriefing session is a pre-simulation scenario briefing. This consists of a few quick moments before an exercise during which the educator briefly covers a few items. It is important that the educator creates an environment of trust and respect early, typically in these pre-briefing sessions [35;63]. The objectives of the scenario, expectation of participation from learners, and intent of the learning experience (i.e., mistakes are acceptable or the time will be used for evaluation) should be covered. In addition, participants should be told that there will be a debriefing after the exercise. These items set the stage for the debriefing and prepare the participants to be involved. It primes learners' brains for a discussion after the events.

There are parts of the debriefing session that should occur in specific order to create an environment for learning: a discussion of the experience, time for students to reflect on the activity, and evaluation with the facilitator and peers regarding what they learned and what could be done to modify behaviors based on the experience. These parts can be clarified as description, analysis, and application [35; 47]. Without a facilitator, participants may have trouble moving past the initial descriptive phase of the debriefing process. Faculty should be the guide in the session to address these areas and help participants address all the parts of the debriefing.

Description

The description period is a time for participants to verbally express the emotions experienced in the scenario and describe their perspective of events that occurred. This can simply be facilitated by asking an open-ended question to the group, such as, "What did you experience in the simulation?" or "What emotions did you have during the session?" This should occur at the beginning of the debriefing session; otherwise, the participants will be distracted by unaddressed emotions. The educator should remember that their participants are adult learners and each brings his or her own experiences, culture, background, skills, and knowledge to the simulation session. It should be insisted that there is a culture of respect and consideration for all members of the group [36;64].

Analysis

Analysis can occur after understanding of the perceived events has occurred and emotional concerns have been addressed. At this point, there should be a review of events and their impact on the scenario outcomes. Reflection on practice is a crucial step for learners in the experiential learning process [37;67]. Every action that occurred in the simulation should have a reaction or result in response to it. Even if undesirable results occur, they must be addressed in this portion of the debriefing. This is when learners will gain an understanding of how their actions, either individually or as a group, impacted the course of events for the scenario. When student-driven, this learning can be very powerful for participants and often leads to clarity and understanding of lesson material that had been abstract. The learning objectives of the simulation should be tied into this analysis process. Participants enter the scenario wanting to learn, and mistakes are not usually intentional. Discovering the thought processes behind events will give clarity to the group and instructor as to why they were correct or incorrect. This should all occur as part of the analysis portion of the session. The facilitator should remain objective and use open-ended questions to promote reflection and critical thinking by participants.

Application

The final part of a debriefing session is application. The majority of simulation participants are, or are aspiring to be, practitioners; their time is valuable to them, and they want to know that what they just experienced has relevance to their career path. Be sure to give the results of the simulation's everyday application by tying it to the learners' scope of practice. This may be reflected in the learning objectives or in the basic concepts of teamwork, communication, patient safety, and professionalism.

ROLES DURING A DEBRIEFING SESSION

There are two basic roles during the debriefing session: faculty and student. Students should be involved in an active discussion that is facilitated by the faculty member. Students should have the most active role, directing the course of discussion and engaging in the majority of talking. It should be emphasized that participation is expected of all students. Treat the group with respect, and appreciate that they all have something to contribute to the session. Allowing student answers and comments to lead the debriefing gives participants an active role and creates personal accountability in the learning process.

However, this is often a difficult practice for faculty educators. The concept that the students have the most important information to share and the faculty are there only to guide others is unfamiliar and can take some practice to perfect. The easiest way to facilitate discussion in the group is with the use of open-ended questions. There will be times when responses are not immediate following these questions. It is important to allow time for silence to draw out participant comments. Consider the silence as time when the participants are gathering their thoughts and forming their answers to the question. The open-ended questions will not require students to regurgitate facts and figures; they require critical thinking and individual reflection. The responses will not be as immediate as some educators expect.

Understanding the process and concepts of debriefing is important. It can be helpful to find an experienced faculty member in these practices and model an approach to his or her strengths. These experienced members can also be very helpful in providing constructive feedback on the management of debriefings.

Instructors may wish to use a video of the simulation scenario in a debriefing session. This can be useful but also distracting to learners. Studies are mixed regarding the effectiveness of using video in debriefing on learners' outcomes. Grant, Moss, Epps, and Watts reported there seemed to be little impact on the scoring of outcomes between simulation participants, but those debriefed with video often exhibited more desirable behaviors during scenarios than the control group [38;68]. It can be helpful to show participants a global image of how the group performed (the actual performance of participants versus their perceived performance) to give an added perspective to the scenario [35;65;66]. However, the thought of being recorded and knowing the video will then be used for debriefing later can be distracting to some individuals. It is important to ensure students' privacy and to let them know how the video will be used.

When using video, it can be very easy to collapse into focusing on the negative—what went wrong or one person's mistakes. This can create a negative learning environment and may even be embarrassing for individuals whose poor performance is emphasized on screen. If using a video in debriefing, utilize open-ended questions and let students guide the discussion whenever possible. Be sure to let students know what went well and show clips of this, as well as examples of behaviors needing improvement.

TIPS FOR SUCCESSFUL DEBRIEFING

Historically, teaching in health care has been authoritarian in nature, with the experts imparting their knowledge to novice learners. However, this method can create anxiety and reproach in learners, especially when they are about to be critiqued on their performance. In a debriefing session, this type of relationship can be disruptive to the reflective learning process. As the facilitator, a few key points can keep the learning experience positive. Before the simulation experience starts, set a culture of mutual respect among all involved parties to foster open communication. In this environment, team members can review their performance without being judged. If all learners are encouraged to participate, it will lead to an adoption of open communication [32].

One of the simplest ways to provide a safe environment in debriefing sessions is to ensure confidentiality. Simply put, the motto of "what happens in the simulation lab, stays in the simulation lab" should be adopted. Because simulation can be used for a variety of educational and training purposes, it may not just be the participants who have concerns about errors or systems issues that occur. For example, doing a simulation of cardiac arrest scenarios at a hospital site where systems concerns arise, such as paging errors or delays in the arrival of life-saving equipment or response teams, could have an impact on patient outcomes. A privacy agreement will protect all involved while creating a safe environment in which debriefing and learning can occur.

As the facilitator, avoid accusatory and negative questioning. This can be particularly hard when an obvious error has occurred. A technique called "debriefing with good judgment" is an excellent method to employ at all sessions, but especially in these circumstances. It creates an environment that is safe for participants but challenges them to analyze and fairly critique the team's performance via guidance by the facilitator. Under this method, there are levels of debriefing competence from low performance (i.e., a judgmental debriefer) to the highest performance (i.e., debriefing with good judgment). Educators whose focus is solely on students doing the right thing (as defined by the educator) would fall into the judgmental category. These educators typically make participants feel bad about mistakes or performing poorly. For these types of educators, students feeling inferior or bad about themselves is fine because it is for the purpose of learning. A blaming and accusatory tone is often used, and the instructor often directly provides the solution to students [37;65].

A nonjudgmental approach avoids blame and accepts that people make mistakes, particularly in the name of learning. These educators are concerned about maintaining a good relationship with students. They want to deliver a critical message while avoiding negative feelings and defensiveness, ensuring the psychological safety of everyone involved [37;65]. The dilemma for these educators is how to provide constructive and serious feedback while maintaining a positive relationship with students. At this level, the educator withholds judgment and tries to lead the students in a kind and accepting tone. Often, this technique fails because participants never realize they need to improve or change practice, as it is not addressed correctly.

The optimal approach has been described as debriefing with good judgment. With this method, facilitators share their observations, opinions, and judgments from the perspective of their expertise and experience. However, this method creates a safe environment in which adult learners (including the facilitator) are enabled to meet learning objectives collaboratively [37;65]. It is important for educators not to present themselves with omnipotence, as having all the answers and a sense of righteousness. Instead, the facilitator has the responsibility of fostering curiosity and learning while maintaining mutual respect among participants in the group.

When debriefing with good judgment, the educator should avoid shame by not blaming learners. In this approach, mistakes are acceptable in the safe learning environment of simulation. The goal is to have an active discussion in which everyone involved feels empowered and comfortable discussing what occurred in the scenario, including difficult topics. As the leader, the educator will set the stage for learning by putting the occurrences of the scenario into the context of clinical practice. However, this approach can be flawed if not used carefully. Despite the attempts to withhold judgments, the attitudes and criticisms of the instructor can come across in facial expressions or body language [37]. It is important to be cognizant of this when using this approach.

An educator who debriefs with good judgment remembers that participants enter the simulation intending to learn and they most likely participated to the best of their ability and skill level. If a mistake is made, the team's experiences, knowledge, and frame of mind should be taken into consideration. Facilitators using good judgment realize they are not the only ones who have valuable input to share, and they let their learners' know this by encouraging their participation in discussion. As adult learners, they too may learn while leading the group.

Teaching using these techniques is foreign to some educators, but there are steps to take to help reach this higher level of debriefing skill. Be clear when providing input to students. Use open-ended questions to invite learners to participate and share insights. Framing the questions to be nonjudgmental is also helpful. Begin by stating an observation, and then voice your question or concern; this helps maintain an objective approach. For example, an educator could say something like, "I noticed there was trouble deciding when to start chest compressions for CPR. Someone share what you were considering during this time." This type of question promotes inquiry for the group to join the discussion while considering their backgrounds as adult learners.

There are some other factors to keep in mind to help create a successful debriefing session. Whenever possible, avoid singling out one student, task, or skill. Keep the discussion broad, and focus on the performance and not the individuals. This is helpful in keeping participants from feeling attacked or vulnerable and becoming defensive or quiet. Be sure to give as much weight and attention to what went well as to what did not. It can be easy to get trapped into analyzing mistakes and to overlook the achievements that occurred during the simulation session [35;65;66]. Identify mistakes as teaching moments or chances for learning instead of negative actions. Making sure there is enough time dedicated to the debriefing can also help to prevent this as well, as the instructor will not feel rushed to cover only the mistakes.

Time allotment can be tricky when it comes to scheduling a debriefing session. It can be difficult to decide on an amount of time to allow for debriefing, and recommendations vary widely in the literature. For example, Decker recommends 20 to 30 minutes, while Arafeh, Hansen, and Nichols recommend three times the length of the simulation scenario [32; 39]. As a general rule, it is a good idea to allow at least half the amount of time of the simulation for a debriefing at the end. For example, a one-hour simulation should have at least 30 minutes for debriefing afterward. The most important message is that debriefing is an essential part of learning in simulation education and time must be allocated for this purpose [4; 40;69;70]. Other factors can influence the amount of time needed, including the skill level of students, how successful the participants were in the simulation, and the need for remediation. Students with higher skill levels may require less time, as there could be faster completion of the simulation exercise or there may be fewer questions. If the simulation runs well, it usually leads to a smoother and quicker debriefing session. If students require remediation on skills, do not understand the concepts of the simulation, or need help making sense of the session, then debriefing will take longer.

Whenever possible, it is important to have the debriefing immediately after the simulation scenario. This allows for easier transition of thoughts and emotions while they are still very fresh to learners. Avoid interruptions in the simulation scenario whenever possible, because it will break the flow of the session and the students' train of thought, saving suggestions and critiques until the end of the scenario. If available, use a room separate from the simulation room for debriefings. Changing locations allows students a mental break before beginning the discussion. If a debriefing takes place in the simulation room, students often stay in task mode or are distracted by what they could have done. This distraction can be a barrier to their participation in the discussion.

CONCLUSION

Welcoming the use of simulation as an educational tool into one's teaching practice can be rewarding for educators and their students. Its increased usage in many fields and the growing research on effective methods leading to improved learning outcomes gives credit to this modality. The learner-centered approach gives real-life applicability to clinical problems that can produce opportunities for participants to analyze, apply, and synthesize new and previously learned content [41; 46]. However, these methods can be challenging to learn and master. When first starting, educators may find it helpful to shadow or mentor with another faculty member proficient in these methods. Using simulation is a teaching practice with a wide array of applicability in healthcare education and staff development. Educators can adopt published scenarios or create their own. When coupled with an effective, learner-driven, reflective debriefing session, the educational rewards can be monumental for all involved.

Implicit Bias in Health Care

The role of implicit biases on healthcare outcomes has become a concern, as there is some evidence that implicit biases contribute to health disparities, professionals' attitudes toward and interactions with patients, quality of care, diagnoses, and treatment decisions. This may produce differences in help-seeking, diagnoses, and ultimately treatments and interventions. Implicit biases may also unwittingly produce professional behaviors, attitudes, and interactions that reduce patients' trust and comfort with their provider, leading to earlier termination of visits and/or reduced adherence and follow-up. Disadvantaged groups are marginalized in the healthcare system and vulnerable on multiple levels; health professionals' implicit biases can further exacerbate these existing disadvantages.

Interventions or strategies designed to reduce implicit bias may be categorized as change-based or control-based. Change-based interventions focus on reducing or changing cognitive associations underlying implicit biases. These interventions might include challenging stereotypes. Conversely, control-based interventions involve reducing the effects of the implicit bias on the individual's behaviors. These strategies include increasing awareness of biased thoughts and responses. The two types of interventions are not mutually exclusive and may be used synergistically.

Works Cited

1. Gaberson KB, Oermann MH, Shellenbarger T. *Clinical Teaching Strategies in Nursing*. 5th ed. New York, NY: Springer Publishing Company; 2017.
2. Skiba DJ, Barton AJ. Adapting your teaching to accommodate the net generation of learners. *Online J Issues Nurs*. 2006;11(2):5.
3. Hayden J. Use of simulation in nursing education: national survey results. *J Nurs Reg*. 2010;1(3):52-57.
4. Kiernan LC. Evaluating competence and confidence using simulation technology. *Nursing*. 2018;48(10):45-52.
5. Aebersold M. Simulation-based learning: no longer a novelty in undergraduate education. *OJIN*. 2018;23(2).
6. Leonard M, Graham S, Bonacum D. The human factor: the critical importance of effective teamwork and communication in providing safe care. *Qual Saf Health Care*. 2004;13(Suppl 1):i85-i90.
7. Rudolf JW, Simon R, Raemer DB. Which really matters? Questions on the path to high engagement in healthcare simulation. *Imul Healthc*. 2007;2(3):161-163.
8. Strouse AC. Multidisciplinary simulation centers: promoting safe practice. *Clinical Simulation in Nursing*. 2010;6(4):e139-e142.
9. Garret B, MacPhee M, Jackson C. High-fidelity patient simulation: considerations for effective learning. *Nurs Educ Perspect*. 2010;31(5):309-313.
10. Shapiro MJ, Williams KA, Kobayashi L, et al. Civilian medical simulation centers as a regional resource for training and skill sustainment of reserve component medical personnel in combat casualty care. *Simul Healthc*. 2006;1(2):120.
11. Schrage M. Serious Play: *How the World's Best Companies Simulate to Innovate*. Boston, MA: Harvard Business School Press; 2000.
12. Thomas CM, Kellgren M. Benner's novice to expert model: an application for simulation facilitators. *Nursing Science Quarterly*. 2017;30(3):227-234.
13. Griffin-Sobel JP. The ENTRÉE model for integrating technologically rich learning strategies in a school of nursing. *Clinical Simulation in Nursing*. 2010;5(2):e73-e78.
14. Rosen MA, Salas E, Wilson KA, King HB, et al. Measuring team performance in simulation based training: adopting best practices for healthcare. *Simul Healthc*. 2008;3(1):33-41.
15. Gaba DM. The future vision of simulation in health care. *Qual Saf Health Care*. 2004;13(Suppl 1):i2-i10.
16. Cato ML. Using simulation in nursing education. In: Jeffries PR (ed). *Simulation in Nursing Education: From Conceptualization to Evaluation*. 2nd ed. New York, NY: National League for Nursing; 2012: 1-12.
17. Mayville ML. Debriefing: the essential step in simulation. *Newborn Infant Nurs Rev*. 2011;11(1):35-39.
18. Laack TA, Newman JS, Goyal DG, Torsher LC. A 1-week simulated internship course helps prepare medical students for transition to residency. *Simul Healthc*. 2010;5(3):127-132.
19. Okuda Y, Bryson EO, DeMaria S Jr, et al. The utility of simulation in medical education: what is the evidence? *Mt Sinai J Med*. 2009;76(4):330-343.
20. Glavin RJ, Gaba DM. Challenges and opportunities in simulation and assessment. *Simul Healthc*. 2008;3(2):69-71.
21. Ziv A, Wolpe PR, Small SD, Glick S. Simulation-based medical education: an ethical imperative. *Acad Med*. 2003;78(8):783-788.
22. Robertson B, Schumacher L, Gosman G, Kanfer R, Kelley M, Devita M. Simulation-based crisis team training for multidisciplinary obstetric providers. *Simul Healthc*. 2009;4(2):77-83.
23. Rudy SJ, Polomano R, Murray WB, Henry J, Marine R. Team management training using crisis resource management results in perceived benefits by healthcare workers. *J Contin Educ Nurs*. 2007;38(5):219-226.
24. Bush MC, Jankouskas TS, Sinz EH, Rudy S, Henry J, Murray WB. A method for designing symmetrical simulation scenarios for evaluation of behavioral skills. *Simul Healthc*. 2007;2(2):102-109.
25. Agency for Healthcare Research and Quality. About TeamSTEPPS. Available at https://www.ahrq.gov/teamstepps/about-teamstepps/index.html. Last accessed April 12, 2021.
26. Groff J, Mouza C. A framework for addressing challenges to classroom technology use. *AACE J*. 2010;16(1):21-46.
27. Neil JA. Simulation in nursing education. *Perioperative Nursing Clinics*. 2009;4(2):97-112.
28. Bradshaw MJ, Hultquist BL (eds). *Innovative Teaching Strategies in Nursing and Related Health Professions*. 7th ed. Boston, MA: Jones & Bartlett; 2016.
29. Billings DM, Halstead JA. *Teaching in Nursing: A Guide for Faculty*. 6th ed. St. Louis, MO: Elsevier Saunders; 2019.
30. Kyle R, Murray WB. *Clinical Simulation: Operations, Engineering and Management*. Burlington, MA: Elsevier; 2008.
31. Warrick DD, Hunsaker PL, Cook CW, Altman S. Debriefing experiential learning exercises. *JELS*. 1979;1(2):91-100.
32. Arafeh JM, Hansen SS, Nichols A. Debriefing in simulated-based learning: facilitating a reflective discussion. *J Perinat Neonat Nurs*. 2010;24(4):302-309.
33. Cantrell MA. The importance of debriefing in clinical simulations. *Clinical Simulation in Nursing*. 2008;4(2):e19-e23.
34. Johnson-Russell J. Debriefing Made Easy. Human Patient Simulation Network. 2008.

35. Fanning R, Gaba D. The role of debriefing in simulation-based education. *Simul Healthc*. 2007;2(2):115-125.
36. Wickers MP. Establishing the climate for a successful debriefing. *Clinical Simulation in Nursing*. 2010;6(3):e83-e86.
37. Rudolf JW, Simon R, Rivard P, Dufrense RL, Raemer DB. Debriefing with good judgment: combining rigorous feedback with genuine inquiry. *Anesthesiol Clin*. 2007;25(2):361-376.
38. Grant JS, Moss J, Epps C, Watts P. Using video-facilitated feedback to improve student performance following high-fidelity simulation. *Clinical Simulation in Nursing*. 2010;6(5):e177-e184.
39. Decker S, Dreifuerst KT. Integrating guided reflection into simulated learning experiences. In: Jeffries PR (ed). *Simulation in Nursing: From Conceptualization to Evaluation*. 2nd ed. New York, NY: National League for Nursing; 2012: 91-104.
40. Owen H, Follows V. GREAT simulation debriefing. *Med Educ*. 2006;40(5):488-489.
41. Young P, Burke J. Evaluation of a multidisciplinary, simulation-based hospital residency program. *Clinical Simulation in Nursing*. 2010;6(2):e45-e52.
42. Institute for Healthcare Improvement. SBAR Tool: Situation-Background-Assessment-Recommendation. Available at http://www.ihi.org/resources/Pages/Tools/SBARToolkit.aspx. Last accessed April 12, 2021.
43. Hayden JK, Smiley RA, Alexander M, Kardong-Edgren S, Jeffries PR. Supplement: The NCSBN National Simulation Study: a longitudinal, randomized, controlled study replacing clinical hours with simulation in prelicensure nursing education. *J Nurs Reg*. 2014;5(2):S1-S64.
44. Hughes C. National Nursing Survey Shows Adoption of New Technologies in Educational Programs to Enhance Nurse Graduate Practice Readiness. Available at https://www.businesswire.com/news/home/20170914005500/en/National-Nursing-Survey-Shows-Adoption-of-New-Technologies-in-Educational-Programs-to-Enhance-Nurse-Graduate-Practice-Readiness. Last accessed April 11, 2021.
45. Jimenez F. Using Virtual Patient Simulation in Substitution for Traditional Clinical Hours in Undergraduate Nursing. Available at https://www.researchgate.net/publication/320501303_Using_Virtual_Patient_Simulation_in_Substitution_for_Traditional_Clinical_Hours_in_Undergraduate_Nursing. Last accessed April 11, 2021.
46. McCabe DE, Gilmartin MJ, Goldsamt LA. Student self-confidence with clinical nursing competencies in a high-dose simulation clinical teaching model. *J Nurs Educ Pract*. 2016;6(8):52-58.
47. INACSL Standards Committee. INACSL standards of best practice: simulation design. *Clinical Simulation in Nursing*. 2016;12(S):S5-S12.
48. Koukourikos K, Tsaloglidou A, Kourkouta L, et al. Simulation in clinical nursing education. *Acta Inform Med*. 2021;29(1):15-20.
49. Agency of Healthcare Research and Quality. Health Care Simulation to Advance Safety. Available at https://www.ahrq.gov/research/findings/factsheets/errors-safety/simulproj15/index.html, Last accessed April 17, 2024.
50. Gause G, Mokgaola IO, Rakhudu MA. Technology usage for teaching and learning in nursing education: an integrative review. *Curationis*. 2022;45(1):e1-e9.
51. Koukourikos K, Tsaloglidou A, Kourkouta L, et al. Simulation in clinical nursing education. *Acta Inform Med*. 2021;29(1):15-20.
52. Buljac-Samardžić M, Dekker-van Doorn CM, Maynard MT. What do we really know about crew resource management in healthcare? An umbrella review on crew resource management and its effectiveness. *J Patient Saf*. 2021;17(8):e929-e958.
53. Sterner A, Nilsson MS, Eklund A. The value of simulation-based education in developing preparedness for acute care situations: an interview study of new graduate nurses' perspectives. *Nurse Education in Practice*. 2023;67:103549.
54. Berg BW. Simulation: past, present, and future. *Clin Exp Emerg Med*. 2023;10(2):125-128.
55. Howard S. Increasing Fidelity and Realism in Simulation. Available at https://www.wolterskluwer.com/en/expert-insights/increasing-fidelity-and-realism-in-simulation. Last accessed April 18, 2024.
56. Baayd J, Heins Z, Walker D, et al. Context matters: factors affecting implementation of simulation training in nursing and midwifery schools in North America, Africa and Asia. *Clin Simul Nurs*. 2023;75:1-10.
57. Alsulimani LK, Al-Otaiby FM, Alnofaiey YH, Binobaid FA, Jafarah LM, Khalil DA. Attitudes towards introduction of multiple modalities of simulation in objective structured clinical examination (OSCE) of emergency medicine (EM) final board examination: a cross-sectional study. *Open Access Emerg Med*. 2020;12:441-449.
58. Colman N, Figueroa J, McCracken C, Hebbar K. Simulation-based team training improves team performance among pediatric intensive care unit staff. *J Pediatr Intensive Care*. 2019;8(2):83-91.
59. Lei C, Palm K. Crisis resource management training in medical simulation. In: *StatPearls*. Treasure Island, FL: StatPearls Publishing; 2023.
60. Mommers L, Verstegen D, Dolmans D, van Mook WNKA. Observation of behavioural skills by medical simulation facilitators: a cross-sectional analysis of self-reported importance, difficulties, observation strategies and expertise development. *Advances in Simulation (London, England)*. 2023;8(1):28.
61. Harrington DW, Simon LV. Designing a simulation scenario. In: *StatPearls*. Treasure Island, FL: StatPearls Publishing; 2022.
62. Palaganas JC, Fey M, Simon R. Structured debriefing in simulation-based education. *AACN Adv Crit Care*. 2016;27(1):78-85.

63. Hughes PG, Hughes KE. Briefing prior to simulation activity. In: *StatPearls*. Treasure Island, FL: StatPearls Publishing; 2023.
64. Palaganas JC, Charnetski M, Dowell S, Chan AKM, Leighton K. Cultural considerations in debriefing: a systematic review of the literature. *BMJ Simul Technol Enhanc Learn*. 2021;7(6):605-610.
65. INACSL Standards Committee. INACSL Standards of Best Practice: Simulation debriefing. *Clinical Simulation in Nursing*. 2016;12:S21-S25.
66. Palaganas JC, Fey M, Simon R. Structured debriefing in simulation-based education. *AACN Advanced Critical Care*. 2016;27(1):78-85.
67. Nagle A, Foli KJ. Student-centered reflection in debriefing: a concept analysis. *Clinical Simulation in Nursing*. 2020;39:33-40.
68. Bussard ME. Self-reflection of video-recorded high-fidelity simulations and development of clinical judgment. *J Nurs Educ*. 2016;55(9):522-527.
69. Schertzer K, Patti L. In situ debriefing in medical simulation. In: *StatPearls*. Treasure Island, FL: StatPearls Publishing; 2022.
70. Edwards J. Debriefing for Clinical Learning. Available at https://psnet.ahrq.gov/primer/debriefing-clinical-learning. Last accessed April 20, 2024.
71. International Nursing Association for Clinical Simulation and Learning. Healthcare Simulation Standards of Best Practice. Available at https://www.inacsl.org/healthcare-simulation-standards. Last accessed May 22, 2024.
72. McDermott D, Smeltzer S, Kamerer J. Setting learners up for simulation and clinical success: achieving psychological safety. *Nurs Clin N Am*. 2024; [Epub ahead of print].