

More Than One Way to Debrief

A Critical Review of Healthcare Simulation Debriefing Methods

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Summary Statement: Debriefing is a critical component in the process of learning through healthcare simulation. This critical review examines the timing, facilitation, conversational structures, and process elements used in healthcare simulation debriefing. Debriefing occurs either after (postevent) or during (within-event) the simulation. The debriefing conversation can be guided by either a facilitator (facilitator-guided) or the simulation participants themselves (self-guided). Postevent facilitator-guided debriefing may incorporate several conversational structures. These conversational structures break the debriefing discussion into a series of 3 or more phases to help organize the debriefing and ensure the conversation proceeds in an orderly manner. Debriefing process elements are an array of techniques to optimize reflective experience and maximize the impact of debriefing. These are divided here into the following 3 categories: essential elements, conversational techniques/educational strategies, and debriefing adjuncts. This review provides both novice and advanced simulation educators with an overview of various methods of conducting healthcare simulation debriefing. Future research will investigate which debriefing methods are best for which contexts and for whom, and also explore how lessons from simulation debriefing translate to debriefing in clinical practice.

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Debriefing and feedback have been identified as the most important components of healthcare simulation.^{1,2} Thus, investigating ways to optimize the debriefing experience is critical to maximizing learning during healthcare simulation. Methods used to conduct debriefing in healthcare have been adopted from a diverse array of industries including the military, aviation, business, and psychology.^{3–5} Debriefing is a form of “reflective practice” and provides a means of reflection-on-action in the process of continuous learning.⁶ This reflection-on-action is a key tenet of the experiential learning theory by Kolb,^{7,8} who describes how experience provides a primary source of learning and development. Central to the ideas of both reflective practice and experiential learning is the belief that experience alone does not lead to learning, but rather the deliberate reflection on that experience.^{9,10}

The terms “debriefing” and “feedback” are often used synonymously in the healthcare simulation literature. However, there are important distinctions between the two constructs.⁵ In this review, feedback is defined as information about

performance provided to simulation participants with the intent to modify thinking and/or behavior to facilitate learning and improve future performance.^{11–16} Thus, feedback is viewed as the one-way conveyance of information to the learner. In contrast, debriefing is defined as an interactive, bidirectional, and reflective discussion or conversation.^{12,14,16–20} Debriefing also involves some level of facilitation or guidance (either by a facilitator or the learners) to assist the reflective process.^{2,5,12,17–19,21} Identifying debriefing as a facilitated reflective conversation is an important distinction between debriefing and feedback. Debriefing conversations may occur between simulation participants and facilitators, or among participants themselves, or some combination thereof.

Over the past decade, numerous reports have examined the process of debriefing in healthcare simulation. These reports have included perspectives, empirical investigations, and more recently systematic reviews and meta-analyses. Given the amount of published materials around this topic, it may be difficult for simulation educators to gain an overview of the various methods and techniques employed in modern healthcare simulation debriefing. To help clarify the debriefing literature, we conducted the following critical review. The goals were (1) to examine the methods simulation educators use to conduct healthcare simulation debriefing, and (2) to describe the timing, facilitation, conversational structures, and process elements used in healthcare simulation debriefing.

METHODS

The review followed a nonsystematic, critical review approach.^{22–24} During the review, PubMed, CINAHL, and

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Google Scholar were searched using the search terms “debrief*” and “simul*.” The literature search was conducted between June 2014 and October 2015, with a final search dates of October 14, 2015. The literature search was iterative, with repeated searches of the literature to examine specific topic areas. Hand searches of bibliographies and the examination of grey literature were also employed. Early in the review process, a brainstorming session was conducted to identify, by consensus, key topic areas in healthcare simulation debriefing to review more extensively. Three authors (T.S., W.E., M.B.-F.) independently examined a predefined topic area in debriefing, after which two authors (A.C., V.G.) reviewed the results and assisted in the delineation of key topic areas for inclusion in the current report.

In keeping with a nonsystematic critical review approach, articles reviewed comprised a broad range of materials, including descriptive/narrative reports, qualitative and quantitative studies using both experimental and quasi-experimental methods, literature reviews, systematic reviews, and meta-analyses. Given the diversity of materials reviewed, no attempt was made to quantitate results, grade the levels of evidence, or perform a statistical or meta-analysis. Instead, efforts focused on considering the literature broadly to transparently synthesize relevant materials to provide a comprehensive review.

During the review process, 4 key topic areas in healthcare simulation debriefing were identified and examined in detail. These included debriefing timing, methods of debriefing conversation facilitation, debriefing conversation structure, and debriefing process elements. A summary of these topic areas and their definitions is provided in Table 1.

RESULTS

Two time frames were identified in which the debriefing could occur. These included either after the completion of the simulation event (“postevent debriefing”), or during the simulation event (“within-event debriefing”). Postevent debriefing could be guided by a debriefing facilitator or by the learners themselves without a facilitator. Within-event debriefing was only reported with a facilitator. This resulted in the following 3 general debriefing methods termed: facilitator-guided postevent debriefing, self-guided postevent debriefing, and facilitator-guided within-event debriefing.

Facilitator-guided postevent debriefing was the most commonly reported method of debriefing. With that method, several conversational structures were identified. These conversational structures delineated the flow and context of the debriefing conversation and divided the conversation into various phases, each with a specific focus and purpose. Some conversational structures divided the debriefing conversation into 3 phases, whereas others employed 4, 6, or 7 phases. Several of the conversational structures shared common phases. Some highlighted the importance of one phase more than others. All of the frameworks highlight the importance of guiding the conversation from a beginning, through an examination of events, and then to a summation of learning points relevant for clinical practice.

TABLE 1. Healthcare Simulation Debriefing Topic Areas and Definitions

Topic Area	Definition
Debriefing timing	The timing of the debriefing in relation to the simulation event (postevent vs. within-event).
Debriefing conversation facilitation	The process of guiding the debriefing conversation to explore high-yield areas of discussion. The conversational guide can be a facilitator or the simulation participants themselves (facilitator-guided vs. self-guided).
Debriefing conversation structure	The structure within which the debriefing conversation unfolds during facilitator-guided postevent debriefing. The structure can include 3 or more phases.
Debriefing process elements	Elements used during the debriefing process to optimize learning and maximize the impact of the debriefing experience. These include essential elements, conversational techniques/educational strategies, and debriefing adjuncts.

Multiple debriefing process elements were identified in the literature. These encompassed a wide variety of practices, including essential processes in the debriefing experience, such as creating a safe learning environment, to specific conversation techniques, such as advocacy inquiry, to practices, which could be added to the debriefing experience, such as video review. We divided these process elements into the following 3 general types: essential elements, conversational techniques/educational strategies, and debriefing adjuncts. Table 2 provides an overview of the healthcare simulation debriefing methods included in this report.

Healthcare Simulation Debriefing Timing and Facilitation Postevent Debriefing

Postevent debriefing involves conducting the debriefing conversation after the conclusion of the simulation event. This type of debriefing has also been called “terminal debriefing.”¹⁷ Two distinct ways to facilitate the postevent debriefing were identified and included facilitator-guided debriefing and self-guided debriefing (eg, without a facilitator).

Facilitator-Guided Postevent Debriefing

The most commonly reported method of postevent debriefing is for a single or small number of trained facilitators or “debriefers” to guide the debriefing conversation. The inclusion of a facilitator has a long history and has been identified as one of the key structural elements of the debriefing process.²⁵ The roles of the facilitator(s) are to act as a conversational guide and to ensure that the relevant issues (eg, learning objectives), which occurred during the simulation event or were identified a priori, are discussed, and that the debriefing conversation flows smoothly and does not go off track. As described by Fanning and Gaba,⁵ unlike a traditional “teacher,” the facilitators can position themselves not as an authority or expert, but rather as a colearner. Alternatively, the facilitator can serve as a subject matter expert and provide input to the debriefing discussion on the basis of their experience, expertise, and training.²⁶

TABLE 2. Overview of Healthcare Simulation Debriefing Methods

Timing and Facilitation	Conversational Structure	Essential Elements	Process Elements	
			Conversational Techniques/Educational Strategies	Debriefing Adjuncts
Facilitator-guided postevent debriefing	<ul style="list-style-type: none"> • 3-Phase • Multiphase 	<ul style="list-style-type: none"> • Psychological safety • Debriefing stance or basic assumption • Establish debriefing rules • Shared mental model • Address learning objectives • Open-ended questions • Using silence 	<ul style="list-style-type: none"> • Learner self-assessment • Directive feedback • Circular questions • Advocacy inquiry • Guided team self-correction 	<ul style="list-style-type: none"> • Codebriefer • Debriefing script • Video review
Self-guided postevent debriefing	Cognitive aid driven	<ul style="list-style-type: none"> • Psychological safety • Debriefing stance or basic assumption • Establish debriefing rules • Shared mental model • Address learning objectives • Open-ended questions • Using silence 	<ul style="list-style-type: none"> • Learner self-assessment • Guided team self-correction 	<ul style="list-style-type: none"> • Debriefing script • Video review
Facilitator-guided within-event debriefing	Event/performance focused	<ul style="list-style-type: none"> • Psychological safety • Debriefing stance or basic assumption • Establish debriefing rules • Shared mental model • Address learning objectives • Open-ended questions • Using silence 	<ul style="list-style-type: none"> • Directive feedback • Learner self-assessment • Circular questions • Advocacy inquiry 	<ul style="list-style-type: none"> • Codebriefer • Video review

Self-Guided Postevent Debriefing

A clear departure from the facilitator-guided debriefing is to have the participants themselves facilitate the debriefing conversation and conduct a “self-guided debriefing.” This type of debriefing has also been referred to as “self-debriefing” when performed by individuals or “within-team debriefing” when conducted by teams.^{27,28} Reports of self-guided debriefing describe the use of cognitive aids, such as teamwork evaluation tools or cue card, as a framework for reflection and formative self-assessment.^{27–29} During self-guided debriefing, the participants use the cognitive aids to guide the debriefing discussions, thereby ensuring that the important learning objectives are addressed. There is some evidence that self-guided debriefing may be as effective as facilitator-guided debriefing for behavioral skills training.^{27,28}

Within-Event Debriefing

As opposed to postevent debriefing, within-event debriefing involves interrupting the simulation event to debrief, when needed, and then continuing on with the simulation. This method has also been termed “in-simulation debriefing,” “concurrent debriefing,” or “microdebriefing.”^{14,17,30} This debriefing method is universally described as involving a facilitator who leads the debriefing. Thus, the term “facilitator-guided within-event debriefing” is used here.

Facilitator-Guided Within-Event Debriefing

Reports of facilitator-guided within-event debriefing describe facilitating the debriefing experience through a series of short and highly focused debriefing events. An example of within-event facilitated debriefing involves the use

of “stop-action” debriefing for deliberate practice of procedural and resuscitation skills, called “rapid cycle deliberate practice.”³¹ Using this method, the facilitator stops the actions of the participants any time an error occurs and uses a “pause, rewind 10 seconds, and try it again” approach to allow the participants to redo a specific action again, after corrective feedback has been provided. Debriefing in this paradigm focuses on coaching the participants to maximize performance in real time.³¹ In a similar fashion, the facilitator could pause the simulation, tell the participants the consequences of the error or inaction, and then instruct the participants in the correct action.³⁰ Facilitator-guided within-event debriefing has been advocated to promote deliberate practice.¹⁴ If facilitator-learner communication only involves providing information to learner(s) on performance, then, a more appropriate term may be “facilitator-guided within-event feedback.” However, descriptions of this debriefing method include a discussion or conversation between the facilitator and learners, and not solely feedback.^{14,30,31} Investigation of within-event feedback has been performed in surgery, where it was found to be inferior to postevent feedback/debriefing for the retention of suturing skills.³²

Facilitator-Guided Postevent Debriefing Conversational Structure

For debriefing conducted using the facilitator-guided postevent method, several different conversational structures have been described in the literature. Similar descriptions of debriefing structure have not been described for facilitator-guided within-event or self-guided postevent debriefing, because these are typically short, focused conversations, or are guided by cognitive aids in the case of self-guided

debriefing. The conversational structures used during facilitator-guided postevent debriefing break up the debriefing into a series of phases to ensure the conversation progresses in an orderly fashion from beginning to end. Two general types of facilitator-guided postevent debriefing conversational structures reported were: (a) 3-phase structures and (b) multiphase structures (eg, those with > 3 phases). Phases common to all the conversational structures included an analysis or discussion of events and a summary or application phase, in which the learning acquired throughout the debriefing is solidified and the major take-home messages are distilled. Differences among the conversational structures were noted in the inclusion of a time to deal with reactions and/or emotions. This “reaction” or “defusing” phase is suggested by some to allow participants time to deal with reactions and emotions in order to “clear the air” and allow a less emotionally charged discussion to follow.^{33,34} Some frameworks intentionally omit a reaction phase, with the belief that medical professionals are accustomed to dealing with stressful clinical situations and are able to discuss performance objectively, without the need to analyze emotional reactions.^{26,35} Table 3 provides an overview of the postevent facilitator-guided debriefing conversation structures included in this review.

Three-Phase Debriefing Structure

Rudolph et al^{33,39} described a 3-phase conversational structure for debriefing, consisting of the phases: reaction, analysis, and summary. Using this conversational structure, the first phase of the debriefing (reaction) focuses on the simulation participants exploring their reactions and the emotional impact of the simulation experience. In this phase, participants can “blow off steam” before completing the remainder of the debriefing. A common opening question in this debriefing structure is “How did that feel?” During the second phase (analysis), the focus is on what happened during the simulation and why participants performed the way they did. The third phase (summary) is focused on distilling lessons learned and codifying the insights gained during the analysis phase. A similar 3-phase conversational structure has been described by Zigmont et al³⁴ and is termed as the “3D model” of debriefing. The three conversational phases in the 3D model include defusing, discovering, and deepening. The function of each phase is similar to that described by Rudolph et al.^{33,39}

Another 3-phase conversational structure described by Phrampus et al³⁵ includes the phases of gather, analyze, and summarize and is known as the “GAS” model. Using this conversational structure, the first phase (gather) encourages the team to provide a recapitulation of the simulation events to establish a shared mental model. The second phase (analyze) is dedicated to learner-centered reflection and analysis of the actions during the simulation. During this phase, pointed questions are used to stimulate reflection and expose the learners’ thinking processes. The final phase (summary) ensures that all the important learning objectives and teaching points have been covered and provides a review of lessons learned. This debriefing conversational structure has been adopted by the American Heart Association for use during debriefing in life support courses, such as Pediatric Advanced Life Support.^{40,41}

A similar 3-phase model, which omits a specific reaction or defusing phase, is the “diamond debriefing” method.³⁶ The conversational structure in this model includes the phases of description, analysis, and application. The purposes of the first two phases are similar to those described in the GAS model. The application phase specifically focuses on asking learners how they will apply the lessons learned during the simulation debriefing in their clinical practice.

Multiphase Debriefing Structure

Several facilitator-guided postevent debriefing conversational structures have expanded on the 3-phase models by adding additional phases to the debriefing conversation. These additional phases allow specific focus on key themes and may provide additional structure and support to the debriefing conversation.

A blended approach to debriefing called “PEARLS” (Promoting Excellence And Reflective Learning in Simulation) uses a 4-phase debriefing framework.³⁷ Three of the phases are based on the framework of Rudolph et al, but an additional description phase was added to allow a period to summarize key events or the major clinical problems faced during the simulation. This phase is designed to ensure that facilitator(s) and participants have a shared mental model of what transpired during the simulation.

Another multiphase framework, called Team-Guided team self-correction, Advocacy-Inquiry, and Systemic-constructivist (TeamGAINS), involves 6 sequential phases (Table 3).³⁸

TABLE 3. Postevent Facilitator-Guided Debriefing Conversation Structures

Debriefing With Good Judgment ³³	3-Phase Conversation Structures			Multiphase Conversation Structures		
	3D Model ³⁴	GAS ³⁵	Diamond Debrief ³⁶	PEARLS ³⁷	TeamGAINS ³⁸	Healthcare Simulation AAR ²⁶
1. Reaction	1. Defusing	1. Gather	1. Description	1. Reaction	1. Reaction	1. Define rules
2. Analysis	2. Discovering	2. Analyze	2. Analysis	2. Description	2. Discuss clinical component	2. Explain learning objectives
3. Summary	3. Deepening	3. Summarize	3. Application	3. Analysis	3. Transfer from simulation to reality	3. Benchmark performance
				4. Summary	4. Discuss behavioral skills	4. Review expected actions
					5. Summary	5. Identify what happened
					6. Supervised practice of clinical skills, if needed	6. Examine why things happened the way they did
						7. Formalize learning

The use of the TeamGAINS framework has been associated with positive ratings of debriefing utility, psychological safety, and leader inclusivity.³⁸ The systemic-constructivist techniques used in TeamGAINS focus on individuals within their system and the dynamics of interactions and relationships, rather than individual behavior.⁴²

The healthcare simulation after action review (AAR) is a multiphase framework based on the US Army's AAR methodology.²⁶ Using this conversational structure, the debriefing progresses through 7 phases (Table 3). The acronym "DEBRIEF" can be used to remember the phases. The healthcare simulation AAR format is unique in its explicit review of learning objectives, its reliance on performance benchmarks, and the disclosure of what the simulation facilitator expected to happen during the simulation.²⁶ The inclusion of these phases is intended to ensure a shared mental model and allow participants to objectively compare their performance against a known standard or performance benchmark.

Healthcare Simulation Debriefing Process Elements

Our review identified multiple process elements important to debriefing. These elements were divided into the following 3 categories: essential elements, conversational techniques/educational strategies, and debriefing adjuncts. These process elements correlate closely with the core skills required in setting conditions for productive debriefing recently identified by Der Sahakian et al.⁴³ A brief description of each of the process elements along with references to primary sources, which interested readers are encouraged to consult for a more detailed review, is provided. Table 4 provides an overview of the process elements.

Essential Elements

Seven process elements that are considered essential to effective debriefing were identified. These included ensuring psychological safety, having a debriefing stance or "basic assumption," establishing debriefing rules, establishing a shared mental model, addressing learning objectives, using

open-ended questions, and using silence. The first 3 relate to things that can be performed before the debriefing, and the last 4 relate to things that are performed during the debriefing conversation itself (Table 4).

Psychological Safety

The establishment of psychological safety is essential to optimize learning during simulation and debriefing.^{2,44,45} Psychological safety has been defined as the ability to "behave or perform without fear of negative consequences to self-image, social standing, or career trajectory."⁴⁶ For individuals to be psychologically safe, they must be able to speak without feeling that their words will lead to personal harm or rejection.⁴⁷ This is accomplished by conducting the simulation and debriefing within a safe learning environment.⁴⁴ To establish a safe learning environment, a presimulation briefing can be conducted by the debriefing facilitator(s).⁴⁴

Debriefing Stance or Basic Assumption

As a debriefing facilitator or learner, having a predefined mental stance or basic assumption regarding the interest and abilities of the team involved in the simulation and debriefing is critical. An example of a basic assumption is as follows: "We believe that everyone participating in this simulation is intelligent, capable, cares about doing their best, and wants to improve." Keeping this basic assumption in mind encourages the facilitator and learners to be curious in instances where the team does not perform as expected.³³ This curiosity drives the facilitator to examine the "mental frames" (e.g., frame of mind) that lead to the actions observed.^{33,48} Identifying these frames in the process of formative assessment can help facilitate learning.³⁹

Establishing Rules for the Debriefing

Providing the participants with a basic set of rules for the debriefing can improve psychological safety and prevent potential problems.^{26,43} Debriefing rules include the need for all members to be active participants in the discussion, assurance that the discussion is confidential, and the assertion that the focus of the debriefing is on performance improvement (not individual criticism). This introduction of debriefing rules sets the atmosphere of the debriefing, and can be done during a presimulation briefing or immediately before the debriefing.⁴⁴

Establishing a Shared Mental Model

For a group of simulation participants to collectively discuss a simulation experience, it is important that they have a shared understanding of the events. Therefore, providing time in the debriefing to establish a shared mental model of the events that transpired during the simulation is required. This is typically done by having the team members review the events of the scenario, with input from a facilitator as needed. Providing a specific phase in the debriefing, conversation to recapitulate the key events of the simulation is included in several postevent debriefing conversational structures.^{26,35-37}

Addressing Key Learning Objectives

In keeping with good educational practice, it is important to incorporate clear learning objectives into each simulation event.^{43,45,49} Similarly, addressing these learning objectives during the debriefing is an important step in

TABLE 4. Healthcare Simulation Debriefing Process Elements

Essential elements	<p>Before debriefing:</p> <ul style="list-style-type: none"> • Psychological safety • Debriefing stance or basic assumption • Establishing debriefing rules <p>During debriefing:</p> <ul style="list-style-type: none"> • Establishing a shared mental model • Addressing learning objectives • Asking open-ended questions • Using silence
Conversational techniques/educational strategies	<ul style="list-style-type: none"> • Learner self-assessment • Directive feedback • Advocacy inquiry • Guided team self-correction • Circular questions
Debriefing adjuncts	<ul style="list-style-type: none"> • Codebriefer • Debriefing script • Video review

optimizing learning through simulation.⁴³ Ensuring that the learning objectives are covered in the debriefing can be facilitated by including them in the simulation scenario template.^{50,51} Providing a phase in the debriefing to analyze learning objectives is included in all of the postevent debriefing conversational structures.^{26,33–38} Although it is important to address all the learning objectives during the debriefing, these learning objectives do not necessarily need to be revealed to the scenario participants in details.⁴⁹

Asking Open-Ended Questions

Asking open-ended questions helps facilitate discussion and is designed to foster reflection and self-assessment on the part of the simulation participants.^{26,33–38} Examples of open-ended questions include “Can you tell me what happened when the rhythm changed?” and “Tell me about the teamwork during the simulation?” Avoiding close-ended or “yes/no” questions, such as “Did you notice the rhythm change?” and “Did you have good teamwork in this simulation?” is a key skill of an effective facilitator.

Using Silence

A period of silence often occurs after a facilitator asks an open-ended question. During this silence, internal processes are occurring within the debriefing participant’s minds. They are formulating their thoughts, critically analyzing their mental frames, and consolidating a cogent response to the facilitator’s inquiry. Thus, silence during the debriefing is precious for the participants. Facilitators must be patient after posing questions and use silence effectively as a tool, allowing it to take place as needed.^{5,52}

Conversational Techniques/Educational Strategies

Five conversational techniques and educational strategies, which could be used to skillfully facilitate learning within the context of the debriefing conversation, were identified. As described by Eppich and Cheng,³⁷ these educational strategies were classified into the following 3 broad categories: learner self-assessment, directive performance feedback, and focused facilitation techniques (Table 4).

Learner Self-Assessment

Learner self-assessment involves the simulation participants assessing their own performance. This is typically accomplished via the “plus/delta” method, in which the facilitator or team members ask open-ended questions regarding “What went well?” (plus) and “What could be changed?” (delta).^{26,37,53} Once issues are identified through learner self-assessment, the educator can then selectively use other techniques (advocacy-inquiry, circular questing, guided team self-correction, etc) to promote in-depth discussion on those topics or provide directive feedback, as appropriate.³⁷

Directive Feedback

As noted in the introduction, feedback is the one-way communication of information to participants, given with the intent of improving future performance. Feedback is a well-known and efficient method to facilitate performance modification.^{11,54} When feedback is provided within the context of the debriefing conversation, it is focused at a specific area of performance, without engaging the

participants in a discussion.³⁷ This technique is best applied when the underlying rationale for performance gap is evident and when the participants have little clinical and simulation experience.³⁷ When using directive feedback, the facilitator must provide the context for why they are correcting the technique/behavior for learning to be achieved.³⁷

Focused Facilitation Techniques

Advocacy Inquiry

The conversational technique known as “advocacy inquiry” was first described in the business and organizational behavior literature.⁵⁵ The technique is an effective way to gain insight into another person’s frame of mind or mental frame. When using advocacy inquiry during debriefing, a facilitator first advocates his/her observation of an action or behavior and then inquires about the participant’s frame of mind in relation to the action.^{33,39,48} The approach requires facilitators and learners to be transparent about their thought processes and is a key element to the “debriefing with good judgment” approach.^{33,39,48} An example of an advocacy-inquiry exchange could be an instructor saying “I noticed you had 3 unsuccessful intubation attempts using the laryngoscope (facilitator advocates his/her observation). I was worried about the potential effect of low oxygen saturations on the brain (share his/her point of view). What was going through your mind as you worked to establish the airway (facilitator inquires about the underlying mental frames that lead to the action)?”

Guided Team Self-Correction

Guided team self-correction is an approach that allows simulation participants to correct their own actions.⁵⁶ The approach involves the use of a prespecified model of teamwork skills. Using this approach, the simulation participants are asked to compare their performance against the prespecified model of teamwork, both positively and negatively. The facilitator guides the conversation through questions, which focus on specific components of teamwork within the prespecified model, such as “Tell me how you used your available resources?” After the question, the facilitator allows the team to analyze and self-correct their actions, before sharing their own opinion and observations.⁵⁶

Circular Questions

Circular questions involve asking a third person to describe the relationship between two other people while in their presence. The goal is to explore a dyadic relationship as seen by a third person.^{38,42} Thus, circular questions ask participants to “circle back” and comment from an outside perspective on an interaction in which they took part. Circular questions may allow teams to track behavior patterns, generate new information, and foster perspective taking in the debriefing.³⁸ An example of a circular question would be for the facilitator to ask a nurse to comment on what a physician did upon walking into the room and how another member of the team reacted.

Debriefing Adjuncts

Three adjuncts were identified that could be added to the debriefing experience in certain situations in an attempt

to enhance the learning environment. These included using a codebriefer, employing a debriefing script, and utilizing video review (Table 4).

Codebriefer

Codebriefing is when more than one facilitator is involved in conducting a debriefing.⁵⁷ This approach may be very helpful in some debriefing situations. Cheng et al⁵⁷ described several effective strategies for codebriefing. Some possible advantages of codebriefing include the potential for facilitators to complement each other's styles, the ability to provide a larger pool of expertise and viewpoints, and to improve the ability to cross-monitor and manage learner expectations and needs.⁵⁷

Debriefing Script

Having a facilitator use a debriefing script or cognitive aid may improve the ability of facilitators to effectively lead the debriefing conversation. In one study, the use of a standardized script by novice instructors improved the acquisition of knowledge and team leader behavioral performance.⁵⁸ Simulation scripts, based on the GAS framework,³⁵ are currently used as part of the simulation portion of the Advanced Cardiac Life Support Course and the Pediatric Advanced Life Support Course offered by the American Heart Association.^{40,41}

Video Review

The use of video review during debriefing can have a profound impact on the participants and may help the facilitator guide the debriefing by grounding the discussion using objective evidence of what occurred during the simulation. Although widely recommended and generally favored, several investigations have failed to find significant educational benefits from the use of video-enhanced debriefing.^{59,60} A recent meta-analysis found that video-assisted debriefing yielded similar learning outcomes to debriefing without video review.¹⁷ Important points in using video during debriefing include judicious use of key clips and focusing on video segments that highlight learning objectives or areas of excellent or suboptimal performance.

DISCUSSION

Debriefing is a critical component in the process of simulation-based healthcare education. In this critical review, we explored the various methods in which simulation debriefing in healthcare is carried out. A description of the timing, facilitation methods, conversational structures, and process elements used during healthcare simulation debriefing was provided. Debriefing timing and facilitation methods reviewed included facilitator-guided post-event debriefing, learner-guided postevent debriefing, and facilitator-guided within-event debriefing. Conversational structures used during facilitator-guided postevent debriefing included 3-phase and multiphase models. Multiple process elements to facilitate the debriefing conversation and optimize learning debriefing were identified and reviewed. The various debriefing methods and process elements examined here provide an essential "tool kit" for debriefing facilitators.

Despite the volume of information on debriefing available in the healthcare simulation literature, empiric evidence in support of a specific debriefing method is limited.^{17,18} As such, simulation educators currently have little guidance on which of the various methods described in this review should be used. It is likely that any of the methods reviewed here can be effective, if used appropriately by well-trained and engaged simulation facilitators. Practically speaking, it is important to highlight that the specific debriefing method may be less important than the simple act of debriefing itself. In addition, it is very likely that there is no "best" way to conduct a debriefing, but rather various methods from which simulation educators can choose, depending on the context of the simulation exercise they are conducting, as well as their own skill set and preferences. In fact, debriefers may want to try different approaches to identify which methods they find most comfortable and effective.

When considering which debriefing methods and techniques to use, the authors would offer the following advice. Facilitator-guided postevent debriefing is the most commonly used and most studied method for simulation debriefing. It improves individual and team performance in a number of contexts.^{17,61} Learner-guided postevent debriefing has a small body of supporting evidence indicating that it can effectively improve behavioral skills.^{27,28} Facilitator-guided within-event debriefing has been explored to a limited extent but may be beneficial at improving technical skills, adherence to resuscitation guidelines, and achievement of mastery learning goals.^{14,30,31} However, learners seem to prefer postevent debriefing more than within-event debriefing,³⁰ and skill retention may be longer with postevent feedback.³² The debriefing conversational structures described here have been used extensively during facilitator-guided postevent debriefing. Employing a predefined structure enables the facilitator to act as a conversational guide during the debriefing. Using some type of conversational structure allows the conversation to unfold in an orderly manner, promotes efficient use of time, keeps the discussion on track, and focuses the conversation on important learning objectives. Without a conversation structure, the debriefing conversation is at risk of degrading into an unfocused series of comments or observations. However, no studies have objectively compared the conversational structures reviewed here. An important point to consider when examining the process elements described in this report is that the success of a specific element is highly dependent on the experience and expertise of the debriefer, as well as the experience and expertise of the learner group in relation to the simulation scenario and learning objectives.⁶² Novice learners and those with limited experience with the simulation scenario will likely require significantly more instructor-driven methods of debriefing, such as directive feedback.³⁷ More experienced learner groups will likely need less feedback, and the debriefing conversation is likely to progress well using learner-driven techniques, such as learner self-assessment and team self-correction.³⁷ Using advocacy-inquiry and circular questioning may work well with either type of learner, depending on the context and content of the simulation and the level of insight of the individual learners. Codebriefing, scripted debriefing, and

the use of video review are adjuncts that facilitators can employ to attempt to enhance the debriefing experience. Ensuring psychological safety, establishing a shared mental model, addressing key learning objectives, using open questions, and silence are mandatory components of any debriefing.

This report has several limitations. The review followed a nonsystematic critical synthesis approach. Thus, it is prone to all the risks, and benefits, of a nonsystematic review.^{22–24} Though not “systematic,” the authors sought to conduct a thorough and comprehensive review of the pertinent literature. In addition, the authors themselves have significant experience with debriefing research, providing them with content expertise, which they leveraged during the review. Another potential limitation is the lack of clear definition of some terms used (eg, “feedback,” “process elements,” etc.); thus, some terminology utilized here may not match the definitions used by some simulation educators. In this review, we attempted to assimilate the literature to clarify how debriefing is structured, organized, and conducted in an effort to advance the field. We believe that the topic areas of debriefing timing, facilitation, conversation structure, and process elements provide easy to understand terminology for the complex concepts addressed. Finally, we did not attempt to quantitatively or qualitatively compare the various debriefing methods described in this report. Future studies should seek to investigate which of these methods and approaches works best in what context and for whom. In addition, research is needed to explore how our ever increasing knowledge of debriefing during simulation can be applied to improve the quality of debriefing of real clinical events.^{63,64}

CONCLUSIONS

A large body of literature proposes various methods to conduct healthcare simulation debriefing. This review provides a comprehensive general overview of healthcare simulation debriefing methods with the aim of allowing novice and experienced simulation educators alike to examine more clearly the differences and similarities that exist between the various methods of debriefing to inform their educational practice.

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