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ORIGINAL CONTRIBUTION

Creation and evaluation of a novel, interdisciplinary debriefing program using a design-based research approach

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Abstract

Background: The emergency department (ED) witnesses the close functioning of an interdisciplinary team in an unpredictable environment. High-stress situations can impact well-being and clinical practice both individually and as a team. Debriefing provides an opportunity for learning, validation, and conversation among individuals who may not typically discuss clinical experiences together. The current study examined how a debriefing program could be designed and implemented in the ED so as to help teams and individuals learn from unique, stressful incidents.

Methods: Based on the theory of workplace-based learning and a design-based research approach, the evolved nature of a debriefing program implemented in the real-life context of the ED was examined. Focus groups were used to collect data. We report the design of the debriefing intervention as well as the program outcomes in terms of provider's self-perceived roles in the program and program impact on provider's self-reported clinical practice as well as the redesign of the program based on said feedback.

Results: The themes of barriers to debriefing, provision of perspectives, psychological trauma, and nurturing of staff emerged from focus group sessions. Respondents identified barriers and concerns regarding debriefing, and based on this information, changes were made to the program, including offering of refresher sessions for debriefing, inclusion of additional staff members in the training, and remessaging the purpose of the program.

Conclusions: Data from the study reinforced the need to increase the frequency and availability of debriefing didactics along with clarifying staff roles in the program. Future work will examine continued impact on provider practice and influence on departmental culture.

INTRODUCTION

Debriefing is a form of reflective practice in which participants engage in active self-learning, and developmental intent, while including input from multiple sources.^{1,2} In the context of the emergency

department (ED), staff are often tasked with resuscitation of critically ill patients. These situations are powerful experiences that can serve as learning opportunities, which can be facilitated by reflective practice. Apart from providing opportunities for knowledge acquisition and improvement of technical skills, debriefing also allows providers the space to process emotionally taxing situations.

Debriefing is known to be effective with regard to knowledge, team communication, and even patient outcomes.^{3–5} The creation

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of a debriefing program that fits the context of an individual ED and complement of interdisciplinary providers remains relatively unknown. Debriefing practice and related programs tend to be “one size fits all” without consideration of the unique context(s) in which they are performed. The ED demands that providers adapt to complex pathologies, a gamut of illness severity, and overtaxed resources. Unlike other departments or clinical settings, there is no cap on patient volume, and providers must be ready to attend to a variety of medical and psychosocial patient needs. The ability for staff to come together to discuss challenging cases in a manner that has the potential to enhance knowledge, skills, and attitudes (KSAs) and support provider well-being is critical.

The theory of workplace learning (WPL) focuses on how individuals and teams interact with their work environments as well as how they access opportunities for learning.⁶ Two key factors in WPL are workplace affordances and learner engagement. Workplace affordances are situational factors including tasks, standards of care/practice, and interpersonal dynamics that invite and support staff participation.^{6,7} Feedback and reflection, which are integral to debriefing are also key to WPL.^{6,7} Moreover, when WPL is supported, improvements in outcomes such as job satisfaction, personal growth, patient morbidity/mortality, and well-being can be observed.⁸ Prior research on debriefing in the medical field has mostly focused on its use after simulated cases or critical events, such as mass casualty incidents.^{1,2,9,10} The limited studies of debriefing protocols in the ED have mainly focused on implementation outcomes, such as duration of the debrief, type of cases that were debriefed, and patient outcomes.^{1,2,9} In addition, many qualitative analyses have been limited to the content of the in situ debriefs (i.e., debriefs in the clinical environment) themselves as opposed to how the debriefs fit into the local context.⁹ The theory of WPL can inform creation of a debriefing program, focusing on the interplay and impact of the context and program on each other.

The purpose of the study was to create and evaluate an interdisciplinary debriefing program in the ED. A design-based research (DBR) approach was used to guide program development and elucidate what refinements need to be made to the program using focus group feedback.

METHODS

Study design

Conceptual basis

This is a prospective qualitative study of clinical staff in the ED. Researchers examined the nature of debriefing in the ED using the CIPP (context, input, process, product) evaluation model and DBR, which is described in Table 1, with the corresponding components of the current research project.^{11,12} Even after completion of training (medical school, residency, nursing school, etc.) a significant portion of a provider's KSAs are derived from the day-to-day environment in which they work. DBR was used for this study because it enhances educational practice by acknowledging and understanding the context in which learning occurs. During iterative cycles of the DBR, evaluation data was collected using the CIPP model.^{11,12}

The CIPP evaluation model will be used to describe program outcomes and inform an iterative process generating insights into WBL theory.¹¹ The following questions, framed using the CIPP model, will be answered:

- Q1. How can a systematic debriefing program coupled with a peer support network be designed and implemented in an ED? [Context and Input]

TABLE 1 Design-based research principles

General principles	NYU debriefing program
Occurs in continuous cycles of design, evaluation, and redesign	The program was designed with champions of each stakeholder group at NYU. Feedback from the focus groups (i.e., study results) will be used to iteratively restructure the program to meet participants' needs.
Takes place in authentic real-life settings where learning takes place normally	The program contains a debriefing protocol that is to be used on shift, in the ED, after real-life clinical cases.
Is aimed at both testing and refining theories and also advancing practice	The conceptual framework for the debriefing program was nested in the theory of workplace learning. The project will assist in refining work place learning theory, specifically informal learning, and well as inform local reflective practice.
Is characterized by mixed-methods studies	The current study is a qualitative research study, and next steps for the project will contain quantitative components—including the quality of the debriefs, how frequently they occur, and who performs the debrief. Results from the future study will be supplemented by another set of focus groups and data from both will be used to make changes to the debriefing program.
Designers, researchers, and practitioners with different expertise interact frequently and share their ideas	In the planning phases of the project, stakeholder groups were identified, an organizational analysis was performed, and champions were elected for each stakeholder group.

- Q2. How can the debriefing program be evaluated after implementation, and what feedback is provided during this evaluation? [Process]
- Q3. How has the debriefing program (if at all) impacted emergency providers as individuals, as a team, and as a department? [Product]

Context and input considerations were addressed by identifying key stakeholder groups in the ED, electing champions from each of these groups, and performing an organizational analysis. The product and process portions of the program were evaluated using focus groups sessions.

Initial design

The debriefing program consisted of three components—debriefing education, debriefing protocol, and a peer support network. The *debriefing education*, available to all clinical ED staff (attending physicians, resident physicians, nurses, patient care technicians, physician assistants), was based on the plus-delta model of debriefing, because it was the model with which ED staff had the most familiarity. In the plus-delta model of debriefing, the debrief leader prompts participants to identify what went well (“plus”) and what could have been improved (“delta”), in addition to encouraging self-assessment.¹³ During debriefing education, staff were provided with an introduction to debriefing lecture and the debriefing protocol was socialized with the group. This education was presented to staff during protected education time (i.e., faculty meeting, weekly residency conference, nursing huddles, monthly physician assistant meetings). The resources discussed in the lecture were emailed to all clinical staff to allow for exposure of individuals who were not present at the educational sessions and to serve as a reference for those who attended.

The *debriefing protocol* was outlined on a two-page handout (Data S1, Figure S1). Copies of these handouts were placed in all of the resuscitation rooms in the ED. It was suggested that staff debrief after any clinical case with an Emergency Severity Index of 1—the highest acuity cases in which patients are in cardiopulmonary arrest or require immediate, lifesaving interventions. Staff were also told that they could use the debriefing protocol after other cases they deemed to be (emotionally) challenging.

Finally, formal training in *peer support* was offered to all interested clinical staff. The purpose of the peer support is to provide clinicians with resources after emotionally distressing events, such as resuscitations, with the goal of preventing and mitigating the negative impact(s) of these events.¹⁴ The peer-supporting training was provided to 26 ED staff members including registered nurses, resident physicians, physician assistants, patient care technicians, and attending physicians. The peer support training was a train-the-trainer model for developing peer supporters. Thus, an approximately 10% participation rate from the total number of ED staff was considered acceptable, because those who were trained could champion debriefing in addition to peer support in the ED. Peer

supporters were also provided with instructions on what to do in case of ethical issues or concerns regarding provider well-being.

This research project was approved by the local institutional review board (17-00768). Informed consent for participation in the focus groups and audio recording of focus group discussions was obtained.

Study setting

The study took place in a single adult ED from December 2017 to June 2018 in an urban tertiary care center receiving approximately 80,000 annual visits, with 130 nurses, 20 physician assistants, 60 resident physicians, and 100 attending physicians on staff. All clinical care providers in the ED were eligible to participate in this study.

Prior to this study, there was no formal debriefing education for staff in the ED at the site of the study. Additionally, debriefing did not occur on a regular basis. While all other non-emergency medicine specialties/services were welcome to (and often did) participate in clinical debriefs, they were not part of the formal debriefing program.

Study protocol

Focus group sessions were conducted starting approximately 3 months after debriefing education was completed and all interested staff participated in the peer support training session. The timing of the focus group sessions was deliberate to allow staff enough time to be exposed to and process debriefing education and allow for time to participate in actual clinical debriefs. Focus group sessions were conducted by non-ED staff members to minimize bias and power differentials. Written consent was obtained from study participants.

Key outcome measures

In keeping with the DBR model, the study aimed to describe both the design of a debriefing program (debriefing didactics, use of clinical debriefing on shift, and peer support program) and the iterative improvements suggested in response to the program by participants in focus group sessions. To assess the “process” component of the CIPP model, focus group participants were asked questions regarding their perceived role in the debriefing program/protocol, observations about the weaknesses/strengths of the program, and the implementation of the program in the department. In the future second phase of the study, i.e., the “product” component of the CIPP model, staff will be asked questions regarding outcomes and impact of the program. ED staff were cohorted into focus groups by discipline to mitigate one of the known limitations of focus groups, censoring of information shared due to power differentials. Moreover, this intentional cohorting was performed to mitigate bias that could

come from actual power differentials of staff present (i.e., resident physicians with supervising attending physicians, nursing staff with resident/attending physicians).

Data analysis

All focus group sessions were audiotaped and transcribed verbatim and were deidentified by an outside transcribing service. Transcripts were examined using an iterative constant comparative process using thematic analysis. Coding was used to categorize and summarize concepts and ideas noted in the focus group transcripts. Code saturation was defined as the point in transcript review when no additional issues were identified, data began to repeat, and further data collection was deemed to be redundant.¹⁵

RESULTS

A total of five focus groups were conducted. Participants were cohorted into focus groups based on discipline, with the exception of one mixed group that was held as there were limitations on staff availability.

Transcripts from these focus groups were analyzed to develop codes, categories, and themes. Two randomly selected transcripts were individually reviewed by the principal investigator (PI) and two coinvestigators, meaning that units that expressed similar concepts were grouped into mutually exclusive categories and labeled with a code. The finalization of these codes, organization of subcodes, code/subcode definitions, and provision of examples was performed to create a codebook. A third transcript was reviewed by the PI using the codebook. When no new codes emerged after review of the third transcript, the research group reviewed the codebook and it was concluded that code saturation was reached based on the combination of code identification, code prevalence, and codebook stability. Two additional focus groups were held and the transcripts from these two focus groups were analyzed using the finalized codebook. Table 2 describes the study participants ($n = 27$).

Codes fell into three categories: *practical considerations*, *processing of reactions*, and *learning* (Table 3). *Practical considerations* are defined as usability of the on-shift protocol, issues related to program implementation and quality, and influence of context. *Processing of reactions* is defined as validation of emotions, feelings experienced by staff (individually and as a group), and thinking/listening

to others. *Learning* is defined as the impact of the debriefing program on knowledge, skills, and behaviors on both an individual and a group level. While the current study was only intended to investigate the “process” aspect of the debriefing program, this category and its associated discussions bleed into the “product” aspect of the study which looks at program outcomes and impact.

Four themes related to the debriefing program emerged from the analysis: *barriers to debriefing on shift*, *psychological trauma*, *provision of different perspectives*, and *nurturing of staff* (Figure S2). A mind map was created to organize the themes and subthemes that emerged from the data. The category of *processing of reactions* related to *nurturing of staff*, *psychological trauma*, and *provision of perspectives*. The category of *practical considerations* related to *barriers to debriefing*, while *learning* related to all of the four themes. *Barriers to debriefing on shift* included time, other clinical responsibilities, buy-in, protocol awareness, and emotions and reactions. *Provision of different perspectives* included assessment (of oneself and others), facilitation of communication, and validation. *Psychological trauma* was characterized by reports of feelings of blame and isolation and reports of a punitive culture. *Nurturing of staff* was defined by constructive feedback, comfort, empowerment, and gratitude.

Theme I: Barriers to debriefing on shift

Robust discussion occurred across all groups regarding barriers to performance of the debriefing protocol on shift. One major barrier

TABLE 3 Categories and codes

Categories	Corresponding codes
Practical considerations	Ease of use Protocol implementation Work context
Processing of reactions	Reflection Humanizing Emotion Culture Program impact
Learning	Culture Feedback Program impact Reflection Team dynamics Self-awareness

Focus group	Total participants	Participant discipline
A	10	10 resident physicians
B	4	1 patient care technician; 1 nurse; 3 physician assistants
C	4	4 attending physicians
D	5	5 nurses
E	4	4 attending physicians

TABLE 2 Focus groups

was *education*—i.e., some staff had missed in-person training sessions and others had not checked their email containing documents of the educational resources.

Stakeholder *buy-in* was another commonly cited barrier to debriefing. In one of the attending physician focus groups, participants discussed how interspecialty debriefs would be useful. Despite the potential benefits of debriefing, attending physicians report a lack of buy-in from other services (Table 4, Barriers to debriefing).

Participants in the resident focus group reported that *other clinical responsibilities* led to fragmentation of ED team members, which made it difficult to perform debriefs. Related to this is the concept of *time*. Additionally, an attending physician stated that staff members' own *emotions and reactions* to cases may in themselves become barriers to debriefing.

Theme II: Provision of perspectives

Participants of the mixed focus group described one of the major themes, *perspectives*, with a member reporting an exchange of

vantage points occurred during debriefing. In that same focus group, a participant reported that the use of the debriefing protocol inspired collaboration of staff normally siloed on shift (Table 4, provision of perspectives, category: facilitating communication between staff”).

In a nursing focus group, a participant described how they were able to articulate their opinions using the debriefing protocol (Table 4, provision of perspectives, category: feeling validated). A participant in the attending physician focus group also spoke about reflection and evaluation in relation to feedback from others (Table 4, provision of perspectives, category: able to assess oneself and others).

Theme III: Psychological trauma

Variations of the word “trauma” were used by multiple members of different focus groups to describe recent clinical cases. A participant in the mixed focus group reported that debriefing could be perceived as something *punitive* based on the case outcome. In contrast, another participant in this group saw debriefing as a way by which

TABLE 4 Themes, categories, and representative quotes

Theme	Category	Quote
Barriers to debriefing	Needing buy-in from ED staff and consulting services	“... it's just not part of their culture and I think that's a hard thing to negotiate for them to buy in.”
Provision of perspectives	Facilitating communication between staff	“Some people can have a totally different perspective on what happened, no in like an oh, this code was run badly, but more emotionally how they felt during something so I thought that was really interesting to see different perspectives on that and I also think it was like really humbling ...” “I will say that like within the ED that the one time I find that like we all usually come together, PCT, nurses, PAs, MDs is actually during a very traumatic code. Other than that, we usually will segregate ourselves a little bit on where we sit within the department and things like that so the debrief too I think is good to have those when we all can talk interdisciplinary, you know, kind of raw emotions, raw stuff because I know like sometimes I would probably feel not as comfortable talking to an attending about something or PCT talking to me about something. It gives you a little practice.”
	Feeling validated	“I think we do a good job giving everyone a voice. I feel like as a nurse during the debriefing I can, you know, share my thoughts and people are actually listening and I think that's a great way how they did it during that code that you had where you gave every role like a chance to speak about their experiences and have some comments. That's really good.”
	Able to assess oneself and others	“We're not good at assessing ourselves, it's really poor and I think sometimes listening to other people talk about how the case went, hearing other people vocalize their thoughts helps to, you know, reflect later on because sometimes you did a really good job, but you're thinking you did a bad job and I think hearing it from other people is reassuring.”
Nurturing of staff	Providing comfort	“Sometimes it has like an emotional goal or component, like you, know. Comfort.”
	Expressing gratitude	“... I think the case that we had on Sunday was like a really good example of the fact that like 70% of the department was there for the debrief because literally every single person who was in the department had a role and it was really important to hear from everybody and also like just to express tremendous gratitude for every single person doing everything that they could possibly do and maybe like, you know, we talk about this and have so much focus on it as a residency and as like the doctor end of it, but I'm assuming that it felt good and felt important for people to be recognized for their role.”

staff could overcome a culture of *blame* and *isolation* that they perceive as present in their context.

Theme IV: Nurturing of staff

The final theme that emerged from the data, “nurturing of staff,” with a participant in the attending physician group stating that the use of debriefing could mitigate or prevent the negative impact of clinical cases on provider well-being. In a different attending group, participants reported that the benefits from debriefing extend beyond it being an intellectual exercise to a practice that supports well-being (Table 4, nurturing of staff, category: providing comfort).

A participant in the resident group discussed how the debriefing protocol *empowered* nonphysicians to be leaders of debriefs. In this same group, a participant stated that the debriefing protocol allowed for expression of thanks (Table 4, nurturing of staff, category: expressing gratitude).

Program redesign

In line with the DBR study design, changes to the debriefing program were implemented. These changes were made with respect to the themes of *barriers to debriefing* and *psychological trauma* which emerged from focus group feedback. With regard to the theme of *barriers to debriefing* the following changes were made along with the barriers they addressed: staff already trained in debriefing and peer support were provided the opportunity to participate in refresher training courses (*protocol awareness*), and the training sessions were made available to a wider group of staff who worked in the ED including social workers, departmental leadership without clinical responsibilities, etc. (buy-in, protocol awareness). The refresher course included information about the background of the peer support program, occupational stress outcomes in the health care sector, peer supporter scope of practice, sharing of peer support encounters, and role play. The availability and purpose of the debriefing program was remessageed to all staff, including those newly hired (buy-in, protocol awareness), and the program was additionally publicized by departmental leadership (operations and educational leadership) in hopes of addressing staff concerns regarding time and clinical responsibility constraints as barriers to debriefing. In addition, during other departmental didactics focusing on well-being, the program was showcased.

DISCUSSION

Focus group feedback identified challenges to debriefing that were largely related to departmental context including insufficient resources (i.e., time), inadequate education, and also cultural barriers. In addition, participants articulated a positive impact of the program

on well-being and communication, which may signal initial stages of cultural change.

The theme of *barriers to debriefing* is in line with prior studies that found that threats to professional development initiatives included time constraints, other clinical responsibilities, and lack of support for learning.^{9,16} In another study, nurses reported that formal management strategies for secondary traumatic stress such as debriefing were challenged by time constraints and lack of training.¹⁷ Other studies also cited lack of guidelines and work environment stressors such as overcrowding and heavy workloads as hindering use of debriefing on shift.¹⁸ Study results also indicated that the debriefing program could have benefits to provider well-being. “Nurturing of staff” was a major theme in the current study, which went beyond providing staff time to emotionally collect themselves after resuscitations, but also enabled staff to look beyond themselves and “provide comfort” to each other and “express gratitude” to others. This has implications for staff resiliency and has the power to affect a culture shift. One of the themes of the study, *psychological trauma*, suggests the concepts of humanity and fallibility of providers. The debriefing program may provide at least part of the answer to how clinicians can heal after difficult cases through the use of reflective practice and peer support. Many participants in the study emphasized that while no clinician is perfect, what does unite staff across disciplines is yearning for support, forgiveness, and understanding. Perhaps a debriefing program—debriefing education, debriefing protocol, and peer support network—is the answer to how clinicians can forgive and heal both themselves and their colleagues. Psychological trauma and the burnout, depression, and job dissatisfaction that follow are not an issue unique to emergency medicine—because such similar debriefing programs may have benefit to other fields of medicine and other related fields. Another point that was discussed was how it was felt that debriefing could be used in a manner that is “punitive.” This finding was a surprising perspective on debriefing for study personnel, acknowledging their own positive views toward debriefing. It emphasizes that in poorly trained or unregulated hands that the practice of debriefing can have a detrimental impact on provider learning and well-being. It emphasizes the need to have a quality assurance structure in place for the debriefing program that involves refresher courses on debriefing and also a channel by which staff could report inappropriate use of debriefing practices.

The current study took a different approach than other debriefing studies in that it permitted any clinical staff member to initiate and lead postresuscitation debriefs.^{9,19} This was done purposely to mitigate power differentials among the clinical team. An unexpected finding, which may be attributable to the interdisciplinary nature of the program, was that members of each staff group stated that they felt empowered by taking part in the debriefing program. This is a unique finding because it suggests an impact on culture, despite the fact that this initial part of the study was only intended on gathering evaluative feedback on the program structure. Future focus group sessions will seek to investigate this phenomenon further among all staff groups and assess if a sustained change has occurred. Another noteworthy event that occurred during the study involved the mixed

focus group session. All participants in this group had elected to become peer supporters as part of the debriefing program. Data from this group were the richest out of all of the focus group transcripts. It is surmised that the peer support training may have catalyzed this robust response and that also this group was particularly invested in the program's success. Both local and national attention has been placed on resident and medical student well-being with less focus on the concerns of other nonphysician groups. Perhaps this focus group offered a platform for these participants to express their opinions and have the opportunity improve their practice and work environment.

The WPL theory states that the workplace is where the individual gains vocational knowledge and skills that contribute to their practice.⁶ WPL theory focuses on not only the opportunities afforded to learners but also their perceptions of learning situations, all of which influence learner engagement.⁶ Our focus group feedback suggests high levels of learner engagement as participants requested access to further educational materials and learning opportunities with regard to both debriefing and peer support. Social interactions are key to effective functioning in the clinical workplace and can also impact WPL.⁶ This particularly holds true in the ED where interdisciplinary staff are less siloed than other specialties, because ED staff work side by side to provide patient care. The fact that our debriefing program was designed and presented as an interdisciplinary initiative may have bolstered collaboration and learning up front. This confirms finding of prior interprofessional WPL work in which participants emphasized the need for shared workplace tasks along with reflection on individual and team performance as integral to interprofessional education.²⁰

An interesting finding of the study was that staff members not traditionally in leadership positions were spearheading postresuscitation debriefs. The expansive learning theory emphasizes the concept of communities of learners (in this case, interdisciplinary staff in the ED) and how issues are solved by creation of new ways of functioning.²¹ Because staff not traditionally in clinical team leadership positions (i.e., nurses) reported (and were observed) to be championing clinical debriefing on shift, perhaps exposure to the debriefing program stimulated a shift in culture with regard to team member roles and functioning. Workplace affordances and individual engagement at work are key to understanding how workplaces function as learning environments.²² According to Billet,²² those individuals whose participation is encouraged (or discouraged) impacts learning and engagement. Focus group feedback from interdisciplinary staff, particularly those not traditionally in (team) leadership positions or poised as "experts," signals learner readiness, ability, and engagement, but also shows all staff a readiness of the workplace to provide opportunities and support growth for all. This emphasizes the point that, on the local level, departmental workplace initiatives must acknowledge and involve champions from all disciplines. This may also have implications more broadly in other EDs as well.

With regard to focus group feedback on how to improve in line with DBR, adjustments to the debriefing program were made. Changes in the frequency of instruction on debriefing and peer

support training were increased, and the program was broadly advertised by both research staff and operations leadership. As part of considerations for the COVID pandemic, informational and instructional sessions will also be made available remotely. The increased socialization of the program with departmental staff is hoped to increase staff buy-in and mitigate concerns raised about negative connotations around debriefing (i.e., blame, shame, punitiveness). In the next phase of focus groups, staff will be asked about these issues with program implementation and if resultant changes have answered the concerns raised.

LIMITATIONS

One of the limitations of this study is that it occurred at only one hospital site, which may constrain the generalizability of the results. However, the use of a DBR paradigm may counter this, because the DBR process can allow study methods to be adapted to other clinical contexts. While focus groups can provide rich data about group norms and values, data from participants are self-reported events, rather than actual/observed behaviors. Moreover, responses from participants can be limited by incomplete memories of events.^{23,24} Additional limitations include study personnel's biases when analyzing the data, which were noted through memoing. The PI acknowledged her biases as both someone that works in the ED and someone who experiences the phenomenon that she was seeking to describe.

CONCLUSIONS

Working in the dynamic environment of the ED can be challenging and simultaneously rich with opportunities for learning. The debriefing program inspired discussion and empowered staff who were not traditionally in team leadership positions take charge of debriefing. Staff also reported that participation in debriefing helped them to emotionally process their workplace experiences. An iterative approach that attends to staff needs can enable culture change, and debriefing programs similar to the one in this study may become standard of practice across health care settings.

CONFLICT OF INTEREST

The authors have no potential conflicts to disclose.

AUTHOR CONTRIBUTIONS

Christie Lech led the following: study concept and design, analysis and interpretation of data, drafting of the manuscript, critical revision of the manuscript for important intellectual content, statistical expertise, and acquisition of funding. Erika Betancourt contributed to analysis and interpretation of data and critical revision of the manuscript for important intellectual content. Jo Shapiro contributed to study concept. Diana H. J. M. Dolmans contributed to study concept. Martin Pusic contributed to critical revision of the manuscript for important intellectual content.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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