Innovating Pediatric Emergency Care and Learning Through Interprofessional Briefing and Workplace-Based Assessment
A Qualitative Study

Isabelle Steiner, MD, MME, Audrey Balsiger, BSc,† Mark Goldszmidt, MD, MHPE, PhD,‡ and Sören Huwendiek, MD, PhD, MME†*

Background: Managing pediatric emergencies can be both clinically and educationally challenging with little existing research on how to improve resident involvement. Moreover, nursing input is frequently ignored. We report here on an innovation using interprofessional briefing (iB) and workplace-based assessment (iWBA) to improve the delivery of care, the involvement of residents, and their assessment.

Methods: Over a period of 3 months, we implement an innovation using iB and iWBA for residents providing emergency pediatric care. A constructivist thematic analysis approach was used to collect and analyze data from 4 focus groups (N = 18) with nurses (4), supervisors (5), and 2 groups of residents (4 + 5).

Results: Residents, supervisors, and nurses all felt that iB had positive impacts on learning, teamwork, and patient care. Moreover, when used, iB seemed to play an important role in enhancing the impact of iWBA. Although iB and iWBA seemed to be accepted and participants described important impacts on emergency department culture, conducting of both iB and iWBA could be sometimes challenging as opposed to iB alone mainly because of time constraints.

Conclusions: Interprofessional briefing and iWBA are promising approaches for not only resident involvement and learning during pediatric emergencies but also enhancing team function and patient care. Nursing involvement was pivotal in the success of the innovation enhancing both care and resident learning.

Key Words: briefing, workplace-based assessment, performance, postgraduate training, interprofessional

(*Pediatr Emer Care* 2020;00: 00–00)

The pediatric emergency department (ED) as learning environment faces 4 major challenges. First, although the incidence of critical illness in children is low and often differs from adult patients, when they occur, an adequate and fast response is mandatory.[1] Given their rarity, many trainees have limited pediatric emergency medical experience and often feel inadequately prepared. Moreover, the teams themselves may also struggle with crisis resource management and experience high cognitive load and emotional stress.[2,3] A second issue, shared by many learning environments, relates to the small amount of a resident's work time that is observed by a supervisor, which makes delivery of consistent and frequent feedback difficult.[4,5] Third, although nurses can play an important role in the learning of residents in their early clinical practice and are the most numerous professional group at a clinical workplace, they are often underused as potential sources of formative assessment.[6,7] The fourth problem, again shared by many learning contexts, relates to the post hoc nature of most assessment and feedback approaches.

This constellation of problems does have potential solutions. Two such solutions relate to *briefing* before an encounter and *workplace-based assessment* (WBA), which, if done interprofessionally, could enhance not only learning but also team competence. In the following sections, we will review some of the existing theories related to each of these and describe some current gaps in the existing literature.

Although there is not always time to support learners during a clinical encounter, strategies have been described for supporting learners immediately before an encounter. In the literature, these have been referred to as briefing or priming before an encounter.[8–10] To date, these have mostly focused on medical students as a means of helping prepare them to maximize the impact of an encounter and to ensure that they are prepared for their role in the encounter. In theory, however, there is strong support for such briefing activities for learners of all levels both from a learning perspective and a team safety one. Increasingly, research suggests that too much of our attention is focused on providing teaching based on past behavior (ie, feedback).[11] Although also beneficial, learners' responses to feedback are complex and, at times, not as effective as envisioned.[12] For example, if a supervisor tells a learner that he should be more creative in finding solutions for challenging tasks (negative feedback with a focus on improving), this may be less effective than providing positive feedback. On the other hand, when a supervisor, with the hope for further improvement, tells a learner that she is already good at preventative measures (positive feedback with a focus on prevention), this may be less effective than negative feedback in such a situation.[12] By contrast, briefing can allow supervisors and residents to reflect on their preparedness for the encounter and, as necessary, offer guidance so as to enhance the resident's performance during the encounter. It can also allow for the negotiation of roles and flag particular areas for observation, which can then be used after encounter for prenegotiated feedback, which may have greater acceptance. This approach has been demonstrated to be effective in simulation-based settings.[13]

Briefing has also emerged in recent years as playing a pivotal role in patient safety. This is particularly true in the surgical context where it is now considered a standard of care.[14] In contrast to the learning-focused briefings described previously, surgical briefing involves the full interdisciplinary team and is more task focused. Success in the preoperative briefings in part has also

From the *Department of Pediatrics, Pediatric Emergency Medicine Department, University Children's Hospital, Inselspital, Bern, Switzerland; †Department for Assessment and Evaluation, Institute for Medical Education, Bern, Switzerland; and ‡Center for Education Research & Innovation, Schulich School of Medicine & Dentistry, the University of Western Ontario, London, Ontario, Canada.
Disclosure: The authors declare no conflict of interest.
Reprints: Isabelle Steiner, MD, MME, Department of Pediatrics, Pediatric Emergency Medicine Department, Inselgruppe AG, Inselspital, University Children's Hospital, Freiburgstrasse, CH-3010 Bern, Switzerland (e-mail: isabelle.steiner@insel.ch).

ISSN: 0749-5161

been attributed to the use of a surgical checklist, which ensures that all key areas requiring shared dialog have been touched upon.[15] Similar style safety checklists have been shown to be effective in the intensive care unit[16] and the ED.[17] To date, however, we are unaware of any studies using them to enhance both patient safety and resident education in the care of critically ill patients.

Workplace-based assessments such as Mini-Clinical Evaluation Exercise and Direct Observation of Procedural Skills are well established methods for providing formative assessment in clinical settings.[18–20] When done well, WBAs can have meaningful educational impact.[20,21] Effective implementation, however, can be quite challenging as it requires significant investment in faculty and resident development and it requires time.[18,20,21]

Although recent studies suggest that nurses play an important role in workplace learning,[6,22] nurses are still a relatively untapped resource for WBA. However, according to a pilot study by Christen et al[7] (2015), contrary to popular beliefs, residents can be quite receptive to nurse based WBA. Moreover, as their focus was often on communication and collaborative competencies, nurses felt to offer complementary feedback to that of the physicians who largely focused on clinical judgment.

In an attempt to address the previously noted challenges of a pediatric ED and to enhance the learning around critically ill patients, we developed an innovation involving a combination of interprofessional briefing (iB) and WBA. Based on the previously noted literature, our design was unique in that both the briefing and WBA were designed to be interprofessional. The purpose of this study therefore was to explore the impact, feasibility, and acceptance of these novel interventions—iB and interprofessional WBA (iWBA)—as perceived by residents, nurses, and supervisors. If successful, this research could provide novel learning and assessment approaches not only regarding critically ill pediatric patients but also for other patients seen in the ED regardless of their age or presenting problem.

METHODS

Design

We used a constructivist thematic analysis (TA) approach. Thematic analysis is a pragmatic approach to qualitative analysis involving the search for themes across a data set.[23] Although it draws on some of the techniques of grounded theory,[24] TA remains theoretically flexible and can be adapted to suit the specific affordances of a particular study.

Setting

This study was conducted at the Department of Pediatric Emergency Medicine, University Children's Hospital, Inselspital, Bern, Switzerland. To prepare our residents for the clinical encounter, we first created a briefing checklist (Table 1). This included A (airways), B (breathing), C (cardiopulmonary), D (disability), and E (environment),[1] and this is a standard procedure for handling critical ill patients in pediatric EDs. Once the supervisor received notification of a critical ill child, he and the resident in charge went through the checklist before arrival of the patient. Time permitting, the resident was expected to first describe their planned approach and then receive, as necessary, further direction and feedback from the supervisor. The presence of nurses was suggested but not mandated. Second, to foster direct observation during the encounter, the resident was observed by the supervisor and nurse who were assigned to this patient. After encounter, residents (self-assessment), nurses, and supervisors used the Christen et al's[7] (2015) previously validated iWBA form (Fig. 1).

TABLE 1. Interprofessional Briefing Checklist

- Admitting reason, trauma mechanism:
- Arrival time:
- Age/Sex: Estimated weight ([age +4] ×2):

A (Airways): Safe, at risk, obstructed
➢ (O_2, suction, medicaments, inline stabilization (trauma), intubation)
B (Breathing): RR, oxygen saturation, work of breathing, tidal volume
➢ (O_2, medicaments, intubation)
C (Circulation): HR, BP ($syst_{minimal}$ > 70 mm Hg + [2× age]), pulse (central/peripheral), capillary refill, preload, source of bleeding (trauma)
➢ (iv line, volume substitution, blood tests/glucose, medicaments, eFAST [trauma])
D (Disability): GCS/AVPU, pupils, meningism
➢ (medicaments, imaging [CT, MRI])
E (Exposition): Temperature, petechiae, AMPLE
➢ (medicaments, further diagnostics [x-ray, ultrasound, urine, blood tests])

BP indicates blood pressure; HR, heart rate; RR, respiratory rate; GCS, glasgow coma scale; AVPU score, alert verbal pain unresponsive; AMPLE; allergies medications past medical history last meal, events related to injury.

The study period April to June 2016 was chosen to overlap with a single 3-month resident rotation. Before the study start, supervisors, nurses, and residents were informed about the study and trained in workshops using the briefing and iWBA checklists. In the same workshop, they were trained in giving constructive feedback, which was developed based on previously described best practices.[7,25,26] The duration of the workshop was half an hour and was conducted by I.S. In addition, handouts with the information were distributed to all participants (see additional information in the supplementary appendix). During the study period, monthly reminders were sent out to all participating nurses and physicians.

Researchers

Because the researchers play an active role in data collection and analysis in qualitative research, it is important to provide information about them. The study group comprised 4 researchers. Three of them are physicians. Two of them are pediatricians (I.S. and S.H.) who are highly engaged in medical education. I.S. is a consultant in pediatric emergency medicine and did implement this project at the pediatric ED. M.G. is a general internist and PhD education-research scientist with expertise in practice-based research. One author has a background in psychology (A.B.) and did support this study within a research internship at the Institute for Medical Education. The senior author has also experience in qualitative research and focus group moderation (S.H.).

Subjects

Pediatric emergency medicine residents were at different training levels. Four pediatric surgery residents, 7 pediatric medicine residents, and 3 internal medicine residents were on a 3-month rotation at the ED (1 resident stayed 6 months). One pediatric emergency medicine fellow stayed 1 year at the ED. All supervisors (n = 7) and nurses (n = 32) participated in the study.

Data Collection

At the end of the 3-month study period, 4 focus group interviews were held, 2 with residents (4 participants and 5 participants), 1 with supervisors (5 participants), and 1 with nurses (4

Workplace-based assessment NZKJ

NOTFALL ZENTRUM für Kinder und Jugendliche

☐ self-assessment resident
☐ assessment supervisor (physician and nurse)

Situation:

		What was good?	What can be improved?	Action plan?
Focus	☐ History Taking			
	☐ Physical Exam			
	☐ Medical Measures/Therapy			
	☐ Intervention			
	☐ Medical Advise			
Competencies	Clinical Judgement			
	Organisation/Efficiency			
	Professional Attitude			
	Communication/Interaction			

Comments: **Assessment criterias:** see back of sheet

Date: Supervisor: Resident:
Function: Training year:

Singature: Supervisor: Resident:

FIGURE 1. Interprofessional WBA form.

participants). All participants agreed to participating in and videotaping of the focus group interviews. The focus groups were interviewed separately per profession and hierarchy to foster open discussion. The sessions took place on different days, each moderated by one of the authors (S.H.), who is an experienced moderator of focus groups. Consistency across group interviews was established by a questioning route.[27] Emphasizing different opinions and views as well as enabling in-depth discussions were of great importance. Therefore, participants were asked to write down their thoughts on a topic before group discussion started. Open-ended questions were used to initiate a discussion, and the moderator looked for clarification if necessary. The moderator also encouraged all participants to contribute. Important issues elaborated in one group, which were not addressed in the following group, were brought to discussion in the next group. One assistant moderator (I.S.) was responsible for the video and audio recording, both moderators took comprehensive notes.

Data Analysis

The recordings were transcribed literally by 2 authors (A.B. and I.S.). In accordance with guidelines for TA, 3 authors (I.S., A.B., S.H.) first read all the transcripts while identifying and highlighting preliminary themes.[23] Next, they established themes in an iterative process in which coded themes were discussed by the research team and the discussions, in turn, informed the coding process. The process continued until consensus was reached. The authors not only paid special attention to the frequency but also to the extensiveness of an expressed opinion. The focus was on representing the range of views as accurate as possible.[27]

All participants received no financial incentive and attended the focus groups voluntarily. They all signed an informed consent form to allow videotaping and audio recording. They were assured that all data would be handled confidentially and they cannot be identified by the presented material. Given the nature of the study, in this country, it was considered ethics exempt.

RESULTS

All residents, supervisors, and nurses who participated in the focus group interviews had experiences with both, iB and iWBA, however conducted more often iB than iWBA.

Results of Focus Groups

As depicted in Figure 2, our results suggest that when iB was used, residents, supervisors, and nurses all felt that it had positive impacts on learning, teamwork, and patient care. Moreover, participants suggested that using iB was important in enhancing the

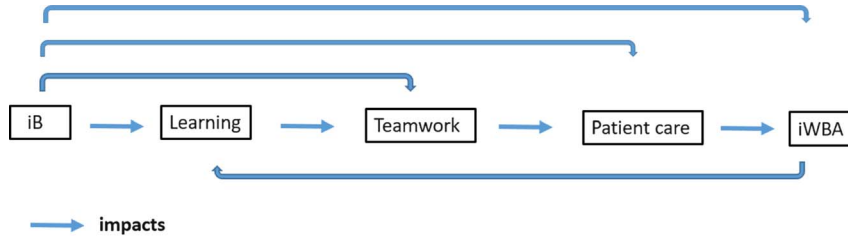

FIGURE 2. Visualization of main results

learning impact of the iWBA. Over time, with increasing uptake across ED teams, participants also described how cultural changes began to take place, which further enhanced especially the way iB was taken up.

Although overall iB and iWBA seemed to be highly accepted and judged as feasible, there were challenges faced when trying to integrate iB and iWBA into current practice. In the following sections, both facilitators and challenges will be described. The overall findings will be presented in relation to the following 4 key areas: impact on learning, impact on teamwork and patient care, feasibility, and acceptance. Representative quotes from the interviews are provided with letters indicating which type of participant (resident [R], supervisors [S], nurse [N]), numbers indicating which focus group session they participated in and a second number indicating which person from that group.

Impact on Learning

Our analysis revealed 4 overlapping learning themes.

The *first theme* related to the identification of knowledge gaps and the creation of teaching moments. This seemed to be true for residents at all levels of training who described its impact on identifying areas of uncertainty and better preparing them for stressful situations. According to residents the learning effect was greatest, when they went through the briefing checklist first and afterward discussed it with the supervisor.

> *"The checklist helps identifying certain knowledge gaps, and that supervisors are aware of a certain need for teaching considering the resident." (R1.4)*

As a result, the supervisor was able to estimate, in advance, how well the resident knew the topic and how much he had to involve himself during the encounter. If time allowed, the residents could also be given the opportunity to preread around the case.

> *"And in this case I said, look it up in the pediatric emergency handbook and we can discuss it together." (S3.4).*

For nurses, briefing could also be instructive:

> *"The checklist not only helps identifying knowledge gaps of residents, but also where I may be uncertain." (N4.1).*

Similarly, self-assessment was felt to be a key characteristic of the iWBA because it supported the development of resident judgment; both what they recognize about themselves and also what they fail to notice:

> *"I find both aspects important. One aspect is to recognize where the resident sees a problem he wishes to discuss, the other aspect is to discuss important points which occurred especially if they concern patient safety." (S3.5)*

Nurses also commented that timing was crucial. If the resident had not been given sufficient time for self-reflection before the iWBA, it was less meaningful.

> *"For me it was a bit difficult because the resident did not self-assess herself beforehand. We had a lot of stress that day … and it may was not the optimal time to do the WBA." (N4.4)*

The *second theme* related to the benefits of interprofessional involvement and more holistic assessments. Residents perceived iWBA as educationally helpful, because nurses were also present during patient care and had a different perspective on resident's performance:

> *"And I think in any case it would be helpful, if someone from each stakeholder group could be present. Someone may focus more on the medical part, or someone more on interaction among each other or empathy. Therefore, I believe that it makes more sense to do the WBA interprofessionally." (R2.2)*

Residents especially appreciated how nurses could provide more insight into how effective the residents were in their interactions with the patients and their families. As the feedback ensuing from this type of iWBA was more concrete, residents also felt that it led to more actionable steps in the future.

Supervisors found iWBA meaningful, because feedback from nurses went directly to residents and not via supervisors:

> *"Especially when there are new residents, often nurses come to us and say, could you please give this feedback to the resident. iWBA is therefore meaningful, because the resident receives the feedback from the nurse in the concrete situation." (S3.4)*

The *third learning theme* related to the synergistic effect of iB and iWBA. All stakeholder groups regarded the combination of iB and iWBA as ideal especially for handling complex patients. In these situations, recognizing and discussing knowledge gaps before and after the clinical encounter was even of greater importance than in less complex/ill patients.

> *"That you can really relate the feedback on something concrete. And this is more feasible when you have discussed something beforehand…therefore I find it very helpful." (S3.2)*

> *"I like to be structured and I think iB and afterwards iWBA is really meaningful. In this way one is prepared and you can expect a feedback afterwards. Therefore, I think that we need both." (N4.4)*

Although it was not always feasible for both to occur, participants agreed that the ideal was using them in combination:

> *"If you discuss the case beforehand, the resident should also receive WBA from the supervisor afterwards." (R2.5)*

The *fourth theme* related to cultural change. More specifically, the valuing of the iB. Over the course of the innovation,

nurses, supervisors, and residents all described how they began to change their practices to increasingly incorporate the iB.

"Briefing was very helpful for me, because I then exactly knew what requires special attention and what I should do next." (R1.1)

"And I think in this regard we all agree that we really implement the briefing checklist in the daily routine and we use it for each patient where it makes sense to use it." (S3.2)

"Even if you know a lot and are quite experienced, it is helpful to systematically use the checklist…. And to figure out, where my uncertainties are." (N4.1)

Participants also described missing the iB when it was not used. For supervisors and nurses, they described how using the iB seemed to also enhance resident competence and impacted on the plans they ultimately developed for their patients. Participants also commented on how they felt it enhanced collaboration as the nurses could now better anticipate what the physicians would be doing.

Impact on Teamwork and Patient Care

We identified 3 themes related to impact on teamwork and patient care.

The *first theme* related to better preparation of residents.

According to residents the calmness and feeling of security through iB had a positive impact on patient care:

"And I was quite grateful for the iB in terms of patient care, that even in stressful situations and also as an experienced resident you are grateful to have a certain guideline, which gives a bit of a structure." (R1.4)

Residents also commented on how they felt prepared for eventualities that may occur and left them less worried about the surprise effect. Having discussed the procedure with the supervisor before meeting with the family further enabled the residents to discuss these with families. That the resident was better prepared by iB; thus, more competent also toward patients, was confirmed by supervisors and nurses. In addition, nurses remarked that residents seemed more relaxed during patient care.

"Certainly it is beneficial for the patient. Because the resident is structured and well prepared, therefore the patient may be better looked after." (S3.5)

"The resident was more relaxed handling the patient because she then exactly knew what she had to look for." (N4.2)

The *second theme* related to clear role allocation and a common plan. All 3 stakeholder groups appreciated the clear role allocation supported by iB, especially regarding complex patients. Each person knew what should be done when and who was responsible for what:

"And I find it very positive if everyone in the room knows what is going on. And this is through iB possible." (R2.4)

"One of the most important points in iB is the clear role allocation. Therefore I think that all involved persons should participate during iB." (N4.4)

"Together with all three stakeholder groups you really have a better plan as a team what will be done first and what will be done afterwards." (S3.5)

The residents perceived that their own increased feeling of security also had a positive impact on teamwork. Through the clear, standardized process supported by the iB, all team members knew the pretreatment plan and therefore the situation in the team was more calm and enabled mutual trust. Interprofessional briefing was also helpful for the supervisor as it allowed them to better estimate beforehand how much involvement on their part would be required.

"With briefing it is helpful for us to see, how much do I have to involve myself regarding patient care, how sure is the resident." (S3.5)

When iB took place with the supervisor only, participants felt that more work was needed to close the loop with nursing staff.

The *third theme* related to building relationships and long-term team cohesion. Participants felt that in the long term, both iB and iWBA were helpful in building team cohesion. It forced the whole team to get in contact together and discuss difficult situations. It promoted the exchange of information openly and not secretly. It allowed progress in a team and prevented that certain prejudices occurred, which were not beneficial for the whole team:

"It also prevents certain prejudices or opinions which occur in a team, which may be hindering for the teamwork. Hence you are able to say, the situation was such and therefore this and this happened." (R1.4)

According to the supervisors, *"ideally, iWBA occurs together with nurses, in this case you can also look at the team performance." (S3.1)*. Nurses seemed to agree with this sentiment adding that it might even be beneficial to have debriefings with mutual feedback:

"But we always speak of the residents, but I think it could also be a feedback for us and maybe also for the supervisors." (N4.2)

Feasibility

Overall, participants felt that both iB and iWBA was in general feasible; however, iB was more easy to integrate into the workflow. Whereas iB could save time by making the whole team more efficient during patient care, with iWBA, it was sometimes an issue to find time amid competing next activities. For it to work, supervisors stressed the importance of giving feedback as soon as possible after the emergency situation. This, however, was not always possible for all team members in the context of the busy ED. Although participants felt that the ideal iWBA took place in a quiet private room, this too was not always possible.

Two other challenges to iWBA related to the superviors' and nurses' ability to offer meaningful feedback. When patients were severely ill and the supervisors needed to take over care, they felt that they had less insight into meaningful feedback for the residents.

"The problem was that I was not always present for the full time with the patient, because as you said we have discussed it beforehand and the patient then was not as ill. Or the patient was very ill and I had to get involved actively. And then iWBA was difficult." (S3.4)

Similarly, nurses also found it difficult to focus on collecting their impressions for iWBA during stressful situations as they were so focused on doing their own roles. By contrast, in less ill patients, supervisors sometimes did not see the necessity to stay

during the complete emergency situation after iB was conducted and as a result also had less insight into resident performance.

Acceptance

Overall acceptance of both the iB and iWBA was high across all participants. Residents particularly appreciated how it balanced their roles as clinicians and learners:

> *"An advantage for me was that I found for the first time the focus was on learning that I personally learn from the case. And not that I am just there to work off the cases." (R1.1)*

In addition, their supervisors seemed to agree and support this as well:

> *"I believe that feedback is extremely important, and when it is structured like this, this is helpful. Therefore we should think of it and do it." (S3.4)*

Because it also enhanced team work, patient care, and safety, it also had the support of supervisors and nurses who felt that they needed to continue to be used following the study period:

> *"And I thought that we have been having everything quite optimized so far. But I must say that these assessments are great. You can work with these instruments and I think we will only profit from it in the future." (N4.4)*

DISCUSSION AND CONCLUSIONS

We set out to study the impact, feasibility, and acceptance of a combination of 2 innovations (iB and iWBA) to address 4 dominant challenges faced by pediatric EDs: (1) balancing care and learning in the ED care of critically ill children; (2) lack of feedback based on direct observation time; (3) inadequate involvement of nurses in resident learning and feedback; and (4) the post hoc nature of feedback. Our results suggest that when iB and iWBA were effectively combined in practice, all 4 problems were addressed.

Balancing care and learning can be extremely challenging in the pediatric ED context.[2,3] In addition, during times when patients present with high acuity, patient care always trumps learning. This may therefore explain why our innovation, especially the iB, seemed to be well accepted by residents, supervisors, and nurses alike. According to the participants, the iB improved care and safety and saved time by enhancing teamwork. It also could serve to reduce stress for all members of the team by enabling them to establish clear role allocation, a common plan, and preparation of medication. Because residents were better prepared for the situation, it also seemed to result in increasing their involvement in these cases. Whereas briefing during simulation[13] and in relation to surgery[15] shares many similar features from an enhanced teamwork perspective, this is one of the first studies exploring its impact on enhancing resident involvement. It is also noteworthy that over time, participants described using the iB for noncritically ill patients suggesting the beginnings of a cultural change in the way work is carried out in the ED and supporting our claims around the importance of the iB in enhancing clinical work and learning.

In its original formulation, Miflin et al[8] (1997) suggested briefing as a strategy for enhancing medical student involvement in clinical work. Emergency departments are also challenging in the diversity of residents' backgrounds and level of experience.[28] In our study, not only inexperienced but also experienced residents and nurses described benefiting from iB. What seemed to be at the heart of its success was the focus on resident self-identification of areas of uncertainty and needs, which could be addressed before a clinical situation. Somewhat surprisingly, nurses also flagged personal benefits to being involved in the iB as they also identified areas of uncertainty and learned from these.

Unlike the iB, the iWBA required teams to spend additional time. As a result, it was not as frequently used. However, participants (especially residents) believed that it offered additional long-term learning benefits. Moreover, when iB was performed before an iWBA, the iWBA was felt to be an even better learning experience. In part, this was due to how much easier the iWBA was to deliver when a pre-encounter briefing had taken place and the iB checklist reviewed. Other features attributed to successful iWBAs included focusing on only a few feedback points and the presence of the nurses for both the iB and iWBA allowing possible topics related to a broader set of perspectives. Although nurses increasingly play an important role in the education of physicians,[6,22] only 1 study—to our knowledge—conducted iWBA.[7] In our study, nurses were supportive of both and further suggested the inclusion of mutual feedback to improve education, clinical care, and teamwork.

Interprofessional briefing was described as feasible and effective in a busy ED. However, consistently conducting both iB and iWBA was described as organizationally challenging. In particular, both time and available space were limiting factors for the iWBA. In addition, if the patient was severely ill and required the supervisor to take a very active role, their attention could be split in such a way as to limit their attention to what the resident was doing, thus limiting their later feedback. However, as shown by Jarris et al[29] (2011), resident-initiated feedback can lead to improved compliance with feedback giving and satisfaction with its receipt.

This study has several strengths and limitations. In terms of strengths, we would cite our data collection and analysis methods, which involved enhancing trustworthiness and credibility of the data through both participant and investigator triangulation. We would also cite the innovation itself, which was theoretically grounded but novel in its application; to our knowledge, our innovation represents a unique application of briefing (iB) and formatively assessing (iWBA). Our major limitations also relate to our methods and the innovation itself. Our study was done in a relatively small program, which limited the number of potential participants and the type of data we could collect. Program size may also have contributed to our success; in a larger program, it may be more difficult to engender the initial buy-in and investment in time from the multiple stakeholders necessary for ensuring that everyone knows how to participate in the iB and iWBA. Future work is also needed in relation to uptake and impact of the innovation. Ideally, this research should capture more longitudinal data and data sources beyond participant perceptions.

CONCLUSIONS

This study explored residents', supervisors', and nurses' perceptions on the impact, feasibility, and acceptance of an innovation involving a combination of iB and iWBA in the pediatric ED setting. When iB was used correctly, all felt that it had not only a positive impact on learning but also on teamwork and patient care. Interprofessional briefing was felt to be more feasible alone than in combination with iWBA. However, when iB was performed before an iWBA, the iWBA was felt to be a better learning experience. Over time, with increasing uptake across ED teams, the introduction of both shaped cultural change, which served to further enhance their enactment. Future research should be longitudinal, capture other sources of data related to impact, and, if possible, multi-institutional.

ACKNOWLEDGMENTS

The authors thank all residents, supervisors, and nurses who participated in this study.

Notes on contributors: Isabelle Steiner, MD, MME (Univ. Bern), is Pediatrician and Pediatric Emergency Physician at the Department of Pediatric Emergency Medicine, University Children's Hospital, Bern. She wrote her Master of Medical Education-Thesis about this project.

Audrey Balsiger, BSc, is Research Assistant at the Institute of Social and Preventive Medicine, University of Bern. She supported this project during her research internship at the Institute for Medical Education in Bern.

Mark Goldszmidt, MD, MHPE, PhD, is a Professor of Medicine and research scientist at the Centre for Education Research & Innovation and the Division of General Internal Medicine at the Schulich School of Medicine & Dentistry, the University of Western Ontario, Canada. His program of research focuses on the intersection of learning and patient care in clinical practice settings.

Sören Huwendiek, MD, PhD, MME (Bern), is Professor of Medical Education and Head of the Department for Assessment and Evaluation at the Institute for Medical Education in Bern. His research focuses on innovative teaching and assessment methods with the ultimate goal of improving patient care.

REFERENCES

1. Maconochie IK, Bingham R, Eich C, et al. Paediatric life support section Collaborators. European Resuscitation Council Guidelines for Resuscitation 2015 section 6. Paediatric life support. *Resuscitation*. 2015; 95:223–248.
2. Luten R, Wears RL, Broselow J, et al. Managing the unique size-related issues of pediatric resuscitation: reducing cognitive load with resuscitation aids. *Acad Emerg Med*. 2002;9:840–847.
3. Eppich WJ, Brannen M, Hunt EA. Team training: implications for emergency and critical care pediatrics. *Curr Opin Pediatr*. 2008;20: 255–260.
4. Atzema C, Bandiera G, Schull MJ. Emergency department crowding: the effect on resident education. *Ann Emerg Med*. 2005;45:276–281.
5. Chisholm CD, Whenmouth LF, Daly EA, et al. An evaluation of emergency medicine resident interaction time with faculty in DiBerent teaching venues. *Acad Emerg Med*. 2004;11:149–155.
6. Burford B, Morrow G, Morrison J, et al. Newly qualified doctors' perceptions of informal learning from nurses: implications for interprofessional education and practice. *J Interprof Care*. 2013; 27:394–400.
7. Christen H-J, Kordonouri O, Lange K, et al. Pilot study on interprofessional feedback in postgraduate pediatric education. *Monatsschr Kinderheilkd*. 2015;163:455–462.
8. Miflin BM, Price DA, Mitchell CA, et al. Briefing students before seeing patients. *Med Teach*. 1997;19:143–144.
9. Roberts NK, Williams RG, Kim MJ, et al. The briefing, intraoperative teaching, debriefing model for teaching in the operating room. *J Am Coll Surg*. 2009;208:299–303.
10. Grover M. Priming students for effective clinical teaching. *Fam Med*. 2002; 34:419–420.
11. Palmer S, McDowall A. The Coaching Relationship: Putting people first. 264 pages. Routledge, Taylor & Francis, London & New York. 2010.
12. Kluger AN, Van Dijk D. Feedback, the various tasks of the doctor, and the feedforward alternative. *Med Educ*. 2010;44:1166–1174.
13. Rudolph JW, Raemer DB, Simon R. Establishing a safe container for learning in simulation, the role of the presimulation briefing. *Simul Healthc*. 2014;9:339–349.
14. WHO Patient Safety & World Health Organization. WHO guidelines for safe surgery: safe surgery saves lives. World Health Organization. 2009.
15. Lingard L, Regehr G, Orser B, et al. Evaluation of a preoperative checklist and team briefing among surgeons, nurses, and anesthesiologists to reduce failures in communication. *Arch Surg*. 2008;143:12–17.
16. Thompson D, Holzmueller C, Hunt D, et al. A morning briefing: setting the stage for a clinically and operationally good day. *Jt Comm J Qual Patient Saf*. 2005;31:476–479.
17. Mullan PC, Macias CG, Hsu D, et al. A novel briefing checklist at shift handoff in an emergency department improves situational awareness and safety event identification. *Pediatr Emerg Care*. 2015;31:231–238.
18. Norcini J, Burch V. Workplace-based assessment as an educational tool: AMEE Guide, No. 31. *Med Teach*. 2007;29:855–871.
19. Wragg A, Wade W, Fuller G, et al. Assessing the performance of specialist registrars. *Clin Med (Lond)*. 2003;3:131–134.
20. Lörwald AC, Lahner FM, Nouns ZM, et al. The educational impact of Mini-Clinical Evaluation Exercise (Mini-CEX) and Direct Observation of Procedural Skills (DOPS) and its association with implementation: a systematic review and meta-analysis. *PLoS One*. 2018;13:e0198009.
21. Van der Vleuten CP, Schuwirth LW, Driessen EW, et al. A model for programmatic assessment fit for purpose. *Med Teach*. 2012;34:205–214.
22. Varpio L, Bidlake E, Casimiro L, et al. Resident experiences of informal education: how often, from whom, about what and how. *Med Educ*. 2014; 48:1220–1234.
23. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3:77–101.
24. Kennedy TJ, Lingard LA. Making sense of grounded theory in medical education. *Med Educ*. 2006;40:101–108.
25. Van de Ridder JM, McGaghie WC, Stokking KM, et al. Variables that affect the process and outcome of feedback, relevant for medical training: a meta-review. *Med Educ*. 2015;49:658–673.
26. Rudolph JW, Simon R, Dufresne RL, et al. There's no such thing as «nonjudgmental» debriefing: a theory and method for debriefing with good judgment. *Simul Healthc*. 2006;1:49–55.
27. Krueger RA, Casey MA. *Focus Groups: A Practical Guide for Applied Research*. 5th ed. Thousand Oaks, California: Sage Publications, Inc; 2015.
28. Bandiera G, Lee S, Tiberius R. Creating effective learning in today's emergency departments: how accomplished teachers get it done. *Ann Emerg Med*. 2005;45:253–261.
29. Jarris LM, Fu R, LaMantia J, et al. Effect of an educational intervention on faculty and resident satisfaction with real-time feedback in the emergency department. *Acad Emerg Med*. 2011;18:504–512.