Simulation and education

PRE-scripted debriefing for Paediatric simulation Associated with Resuscitation EDucation (PREPARED): A multicentre, cluster randomised controlled trial

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Abstract

Aim: Scripted debriefing tools may improve the performance of novices debriefing in resuscitation courses, but this has not previously been measured. The aim of this study was to determine the impact of a script on the quality of debriefs in a statewide paediatric resuscitation course.

Methods: This cluster-randomised controlled trial compared scripted debriefing (intervention) versus non-scripted debriefing (control) for participants in a paediatric resuscitation course. The trial was conducted across participating sites in Queensland, Australia, from November 2017 to February 2020. Debriefing quality was measured using the Observational Structured Assessment of Debriefing (OSAD) tool. The OSAD tool rates 8 domains that comprise the elements of an ideal debrief. OSAD scores between scripted and non-scripted groups were compared, overall and after stratification by debriefer experience and site size.

Results: Seventy debriefings occurred across 19 sites (intervention, n = 34, control n = 36). There was a statistically significant increase in total OSAD scores in the scripted group, compared to non-scripted (mean difference (MD) = 3.5, 95% confidence interval (CI) 0.7–6.2, p = 0.01). The categories of 'reflection' and 'analysis' had the greatest difference in OSAD scores in the scripted group (MD = 0.8, 95%CI 0.2–1.3, p = 0.005; MD = 0.6, 95%CI 0.2–1.0, p = 0.007). After stratification, overall OSAD scores improved for novices (MD = 4.1, 95%CI 0.5–7.7, p = 0.03) and large centres (MD = 5.2, 95%CI 1.1–9.2, p = 0.01).

Conclusion: Providing debriefing scripts to faculty facilitating simulated paediatric resuscitation scenarios improved the quality of debriefing, especially for novices and those at large sites. The development and provision of debriefing scripts for large-scale paediatric resuscitation courses should be considered.

Keywords: Paediatric emergency medicine, Health care simulation, Debriefing, Resuscitation education

Introduction

The optimal intervention to improve the quality of debriefing by novices in a large-scale resuscitation course, delivered in either large or small centres, is not clear. Additionally, it is not known what impact the introduction of a standardised script may have on the quality of the debriefing by novice debriefers and whether this can be maintained across different sized centres, where there are differences in faculty development resources and staff profiles.

Outcomes from paediatric cardiopulmonary arrests are generally poor,[1] which may be improved through early detection and appropriate management.[2] Paediatric advanced life support courses were widely introduced in the 1970 s to improve knowledge and practical skills for a team-based, systematic approach to the resuscitation of critically unwell children.[3] These large scale resuscitation courses have evolved over the years to incorporate simulated scenarios to enhance knowledge and skills retention.[3] Simulated scenarios can be challenging for participants, making debriefing of these scenarios

arguably the most important component, requiring tactful and constructive feedback.[4].

Simulation debriefing for healthcare education is a complex skill that draws from a mix of educational values, conversational artistry and structural techniques.[5] Debriefing is the process of engaging participants to reflect on their performance, to consolidate learning and identify areas for future improvement.[4] Faculty development for debriefing is an identified challenge, with many available training programs presenting financial or geographic obstacles.[6,7] These faculty development challenges are magnified when designing simulation courses intended for wide reach, whereby the ability to supervise and support each individual debriefer rapidly becomes functionally impractical.

One potential solution to these issues is the provision of scripted debriefing tools for individual scenarios. Scripted debriefing tools provide structure and conversational prompts for faculty facilitating a debrief.[8,9] The use of a standardised script by novice instructors to facilitate team debriefings has been shown to improve acquisition of knowledge and behavioral performance during subsequent simulated cardiopulmonary arrests.[8] However, while an educational value has been demonstrated, the impact on the objective quality of the debriefs themselves has not been reported. Several validated tools have been developed to objectively measure the quality of debriefs, which is fundamental to learner outcomes.[10] The objective of this trial was to assess the impact of a scripted debriefing tool on the quality of the debriefs provided in a state-wide paediatric resuscitation course.

Methods

Trial design

This was a multicentre, cluster-randomised controlled trial (cRCT) comparing scripted debriefing (intervention) versus non-scripted debriefing (control) for a state-wide paediatric resuscitation course. A cluster was defined as an individual hospital site where the paediatric resuscitation program was being delivered. The trial was prospectively registered with the Australian and New Zealand Clinical Trials Registry (ACTRN12617001196336) and has been reported according to Consolidated Standards of Reporting Trials (CONSORT) guidelines. The trial protocol is included in the Supplementary Materials. The Children's Health Queensland Hospital and Health Service Human Research Ethics Committee approved the study (HREC/16/QRCH/83).

Study setting

The cRCT was conducted across participating sites in Queensland, Australia, ranging from small rural medical centres to large urban hospitals (Fig. 1), from November 2017 to February 2020. Queensland is a geographically large state of Australia, with a high population density in the southeast region, medium population density to the North, and the remainder dispersed among remote centres hundreds of kilometres apart. The Optimus CORE (Clinical Observation and Response to Emergencies) paediatric resuscitation course is delivered throughout Queensland to 35 sites in all 16 Hospital and Health Service districts. It launched in 2013 under its previous iteration, RMDPP (Recognition and Management of the Deteriorating Paediatric Patient).[11] The Optimus CORE course was developed and continues to be run by the Simulation Training Optimising Resuscitation for Kids (STORK) statewide simulation service, based

at the Queensland Children's Hospital, a large tertiary paediatric hospital in Brisbane, Queensland. Faculty from the STORK service provided 1–2 annual moderation visits to participating sites during the trial, typically serving the purpose of observing the course to provide feedback to the site.

Eligibility and selection of participants

All sites delivering the resuscitation course were eligible for the trial. Individual faculty members who delivered simulation debriefing at a participating site were invited to participate. Debriefers included doctors (trainees or specialists) and nurses. Written consent was obtained from each participant. Participants provided their level of debriefing experience.

Stratification variables

Simulation debriefing experience was stratified into novice versus expert. An expert debriefer was defined by consensus within the research team for the purpose of this study as an individual having performed 10 or more debriefs per year on average over the previous 5 years. Sites were also stratified into large and small centres. Large centres were defined as those servicing a population of at least 100,000, while small centres were those servicing a population less than 100,000.[12].

Randomisation and allocation

Randomisation occurred at the hospital level (sites). Hospitals were ranked according to their expected number of paediatric ED presentations annually.[13] Using the ranked list hospitals were formed into pairs. A list of computer-generated random numbers was used to allocate either the intervention or control treatment to the first of each pair; the second in each pair was allocated the alternative treatment. Randomisation was performed by an independent statistician using computer generated random numbers, and occurred after all sites had been enrolled, ensuring unbiased allocation.

Intervention

Simulated scenarios

The Optimus CORE paediatric resuscitation course involves several skill stations (airway/breathing, circulation, and defibrillation) that are then contextualised with 2 low fidelity immersive scenarios. Scenario 1 involved a 2-month-old infant with bronchiolitis on the background of Trisomy 21 who has episodes of apnoea (respiratory arrest) requiring airway manoeuvres and manual positive pressure ventilation. Scenario 2 involved a 5-year-old admitted to the ward with severe dehydration in the context of gastroenteritis, who has a cardiac arrest (pulseless electrical activity) necessitating cardiopulmonary resuscitation.

Debriefing scripts

Debriefing scripts for both scenarios were developed by expert consensus from members of STORK not involved in data collection at site visits. The scenarios and corresponding scripts are included in the Supplementary Materials. These scripts were designed to incorporate the elements considered necessary for a model debrief, with an 'advocacy-inquiry' framework adopted.[14] The scripts were refined after testing over a 2 week period, prior to the recruitment period. For the group randomised to the intervention, the debriefing scripts were supplied to local participating debriefers with a link to a video that trained them in the use of those scripts. Participants were requested to follow the scripts as closely as possible but were not mandated to
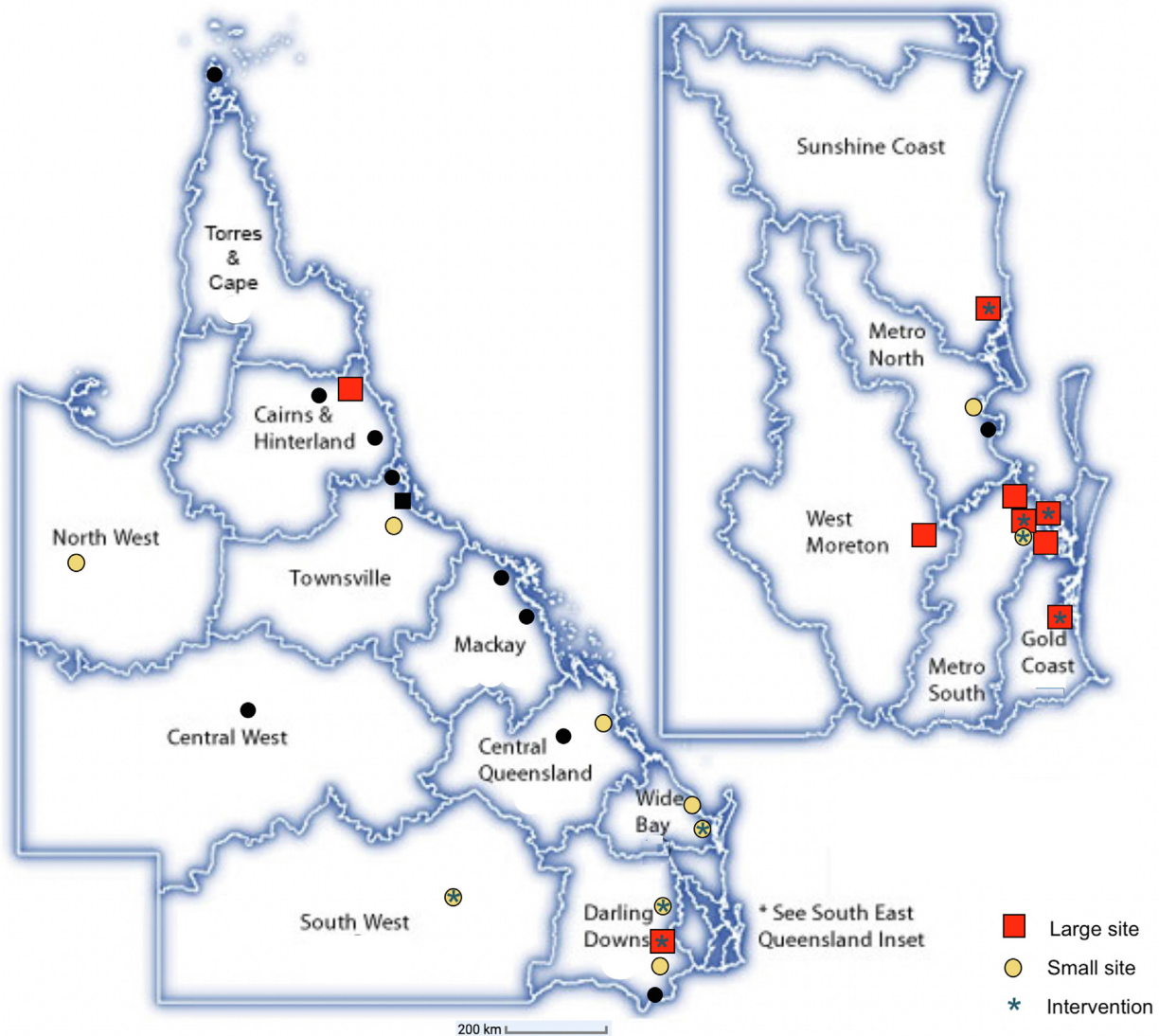
Fig. 1 – Map of Queensland with size, location and allocation of recruiting sites.* Randomised, non-recruiting sites are indicated in black.

rehearse them. For the group randomised to the control group, local participating debriefers received the Promoting Excellence and Reflective Learning in Simulation (PEARLS) debriefing guide and a link to a similar video that trained them in its use.[15] They were not provided with a script or given specific debriefing requests.

Outcome measures
OSAD tool
The Observational Structured Assessment (OSAD) tool measures quality of debriefing. It was developed from a systematic review of the literature and semi-structured interviews, identifying important features of a paediatric simulation debriefing.[16] Three-hundred and seven features were identified and grouped into 8 dimensions (approach, learning environment, engagement, reaction, reflection, analysis, diagnosis, and application), which represent the core components of pediatric simulation debriefing. Each dimension is scored on a five-point Likert scale, ranging from '1' (done very poorly) to '5' (done very well). Scores are provided for each component, from '1'

(minimum) to '5' (maximum), and overall, from '8' (minimum) to '40' (maximum). Higher OSAD scores indicate a higher quality of debrief. The OSAD has been validated to have high internal consistency and inter-rater reliability.[17] Therefore, the OSAD tool is capable of providing consistent assessment of debriefing across multiple sites. Although other debriefing assessment tools are available, OSAD was selected as it features good accessibility as it is freely available to use, does not require any specific user training, and has been translated into languages other than English.[18]

Key outcome measures
The OSAD tool was completed by STORK faculty trained in the use of the OSAD tool. The tool was completed during moderation site visits for the Optimus CORE course. STORK faculty observed participating debriefers debrief the simulated scenarios, without prompting or intervention, and rated them using the OSAD tool. Debriefs undertaken at moderation visits were initially video recorded to later have these videos scored using the OSAD tool by a common

blinded assessor in a physically and temporally removed setting but was ceased about halfway through the trial on September 3rd, 2018, due to logistics and poor acceptance by debriefers.

The primary outcome measure was the overall OSAD scores for the scripted and standard groups, with comparison of the mean difference. Secondary outcome measures included subcategories of OSAD scores, and OSAD scores after stratification by level of debriefing experience and size of the centre.

Blinding

Centres at both intervention and control sites received materials to assist with debriefing. Intervention sites received scripts and control sites received a generic guide, the PEARLS tool.[15] Once assigned, individual debriefers participating at each centre were asked not to disclose what materials they had received to other centres involved in the trial, to maintain blinding. STORK faculty assessing the sites were blinded to the study objectives and site allocations. Therefore, at least at the start of the trial, they would have been unaware of whether they were assessing a scripted or non-scripted debrief.

Sample size

The sample size calculation was informed by the prospective SHARP trial conducted in 2013, which studied surgeons debriefing surgical trainees who had just performed an operation. With the introduction of the SHARP debriefing checklist, they reported a standard deviation on the OSAD tool of 6.8 units.[9] We assumed that a significant change in the OSAD total score is 4 points (equivalent to a mean 0.5 point increase in each of the 8 categories). To identify a clinically important effect of the structured debriefs, with 80% power and alpha = 0.05, we were required to conduct 46 scored debriefs in each treatment group in our trial. To adjust for the clustered nature of the trial, we assumed that the mean number of debriefers at each site is 4 and conservatively estimated the intraclass correlation coefficient = 0.05. Consequently, we required 53 debrief scores in each treatment group.

Data analysis

Summary statistics are reported as mean (standard deviation) or median (interquartile range; IQR) for continuous data as appropriate, and as frequency (percentage) for categorical data. We assessed the between-group difference for continuous outcomes using a mixed–effects linear regression model, with treatment group included as a fixed effect and site as a random effect. This method accounts for within-site correlation in debrief outcomes. Effect estimates are reported as mean difference (MD) with 95% confidence interval (95%CI). Data was analysed using the intention to treat principle. Pre-specified subgroup analyses were conducted to account for centre size and faculty debriefing experience. Statistical analysis was undertaken using Stata software v14.0 (StataCorp, College Station, TX, USA).

Results

Thirty eligible sites agreed to participate and were randomised but, due to logistics, only 19 sites were recruited to the trial (Fig. 1). A total of 36 non-scripted debriefings were completed at 10 sites and 34 scripted debriefings across 9 sites (Table 1). Due to the COVID-19 pandemic restricting travel, the trial ended prematurely as any further site moderation visits for data collection were not possible. No modifications to the trial were required, with the analysis being conducted on a smaller sample size. Fig. 2 outlines the trial's participant flow chart.

Baseline characteristics of the simulations in the intervention and control groups of the trial are listed in Table 1. The median number of simulations per hospital was 2.5 in the control group (IQR 2–6) and 3 in the scripted group (IQR 2–4). Two thirds of scripted debriefing occurred at large sites compared to 40% of standard debriefings occurring at large sites, but this difference was not statistically significant. Overall, there were no statistically significant differences noted between clusters for number of simulations or hospital size. How-

Table 1 – Characteristics of simulations in the non-scripted (control) and scripted (intervention) debriefing groups.

	Non-scriptedCount (%)	ScriptedCount (%)
Hospital level variables		
Number of hospitals	10	9
Simulations per hospital, median (range)	2.5 (2 to 6)	3 (2 to 4)
Hospital size		
○ Small	6 (60.0%)	3 (33.3%)
○ Large	4 (40.0%)	6 (66.7%)
Individual level variables		
Number of simulations	36	34
Hospital size		
○ Small	19 (52.8%)	8 (23.5%)
○ Large	17 (47.2%)	26 (76.5%)
Scenario (n = 55)		
○ 1	13 (56.5)	16 (50.0)
○ 2	10 (43.5)	16 (50.0)
Experience of debriefer (n = 64)		
○ Novice	19 (59.4)	14 (43.8)
○ Expert	13 (40.6)	18 (56.3)
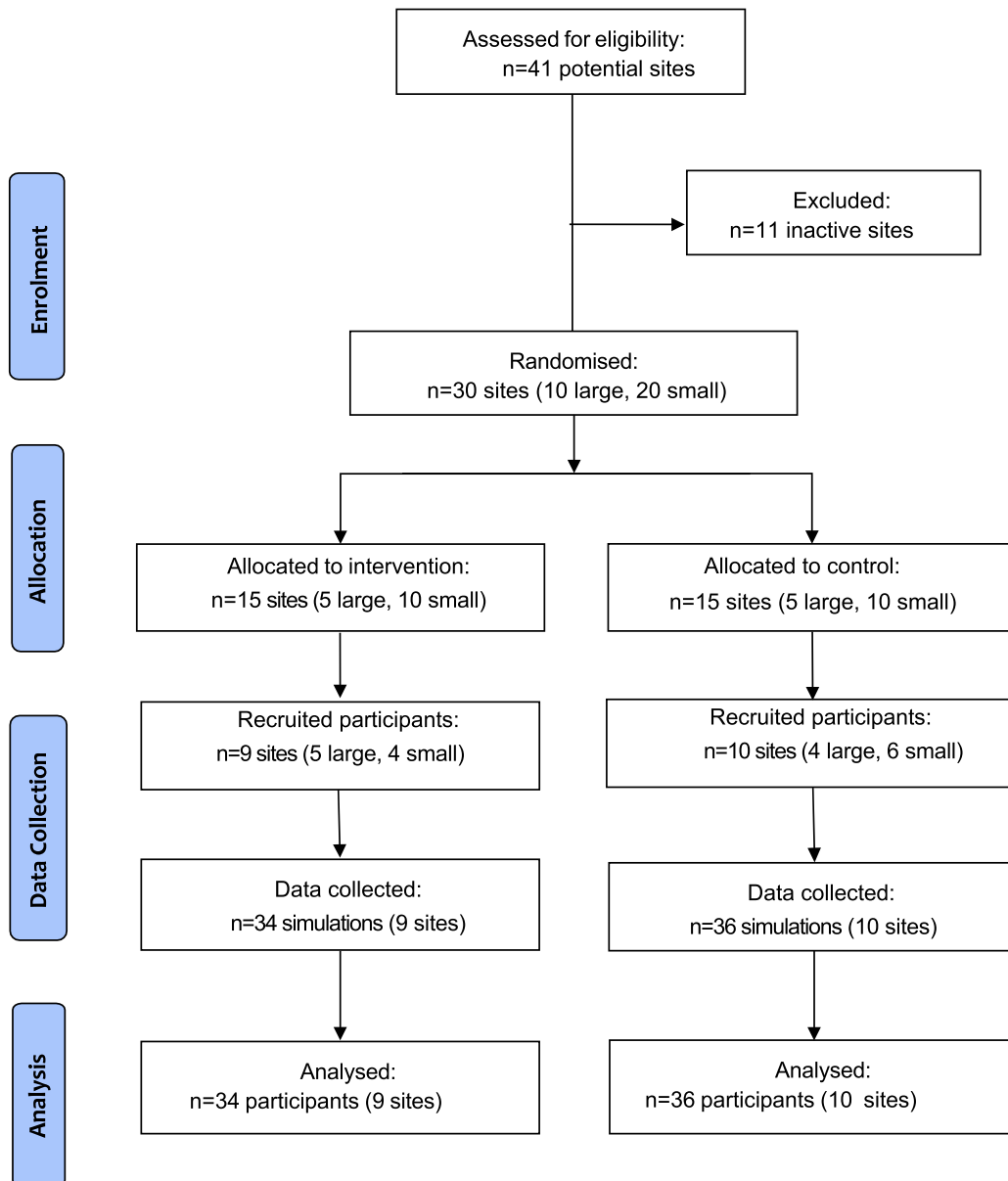
Fig. 2 – Participant flow chart.

ever, at the individual level, there were more large sites who conducted scripted debriefing (53% versus 24%, p = 0.02). There was no difference in the experience of the debriefer, with both novice and expert level evenly distributed between trial groups.

There was a statistically significant increase in total OSAD scores in the scripted group, compared to the non-scripted group (MD = 3.5, 95%CI 0.7, 6.2, p = 0.01) (Table 2). The OSAD tool categories of 'reflection' (MD = 0.8, 95%CI 0.2, 1.3, p = 0.005) and 'analysis' (MD = 0.6, 95%CI 0.2, 1.0, p = 0.007) had higher scores in the scripted group compared with the non-scripted group (Fig. 3).

When data was stratified according to level of experience, for those considered to be novice, the scripts improved OSAD scores overall (MD = 4.1, 95%CI 0.5, 7.7, p = 0.03) and for the categories of 'approach' (MD = 0.5, 95%CI 0.0, 1.0, p = 0.04), 'reflection' (MD = 0.8, 95%CI 0.2, 1.4, p = 0.01) and 'application' (MD = 0.9, 95%CI 0.1, 1.8, p = 0.02) (Table 3) (Fig. 3). For those considered

to have an expert level of experience, the scripts did not significantly improve overall OSAD scores (MD = 1.3, 95%CI −2.4, 5.1, p = 0.48).

With stratification to site size, the scripts improved overall OSAD scores for the large sites (MD = 5.2, 95%CI 1.1, 9.2, p = 0.01) and for the categories of 'analysis' (MD = 0.7, 95%CI 0.0, 1.3, p = 0.04) and 'application' (MD = 1.0, 95%CI 0.4, 1.5, p = 0.001) (Supp Table 1) (Fig. 3). There were no associations identified in the small sites (MD = 0.7, 95%CI −2.9, 4.2, p = 0.71).

Discussion

In this cRCT, we demonstrated that the use of scripts for a statewide paediatric resuscitation course improved the quality of debriefing, particularly for novices. The scripts specifically improved OSAD scores for the domains of 'approach', 'reflection', and 'application'. The findings from this trial have potential implications for the routine

Table 2 – Observational Structured Assessment of Debriefing (OSAD) tool rankings by treatment group.

	Non scripted (Mean SD) (N = 36)	Scripted (Mean SD) (N = 34)	Between group differences (Mixed effects linear regression; 95% CI)	*P*-value
Outcomes				
OSAD Total	30.7 (6.2)	34.1 (4.4)	3.5 (0.7 to 6.2)	**P = 0.01**
OSAD Approach	4.5 (0.7)	4.7 (0.6)	0.1 (-0.3 to 0.6)	P = 0.60
OSAD Environment	3.7 (1.3)	4.1 (0.9)	0.3 (-0.4 to 1.1)	P = 0.36
OSAD Engagement	4.1 (0.9)	4.3 (0.7)	0.2 (-0.2 to 0.6)	P = 0.34
OSAD Reflection	3.4 (1.1)	4.2 (0.9)	0.8 (0.2 to 1.3)	**P = 0.005**
OSAD Reaction	3.7 (1.1)	4.1 (1.0)	0.4 (−0.1 to 0.9)	P = 0.11
OSAD Analysis	3.6 (1.0)	4.2 (0.8)	0.6 (0.2 to 1.0)	**P = 0.007**
OSAD Diagnosis	4.1 (1.0)	4.4 (0.7)	0.3 (−0.1 to 0.7)	P = 0.13
OSAD Application	3.6 (1.2)	4.2 (1.0)	0.6 (0.0 to 1.3)	P = 0.07

Abbreviations: Standard deviation, SD; Confidence interval, CI.
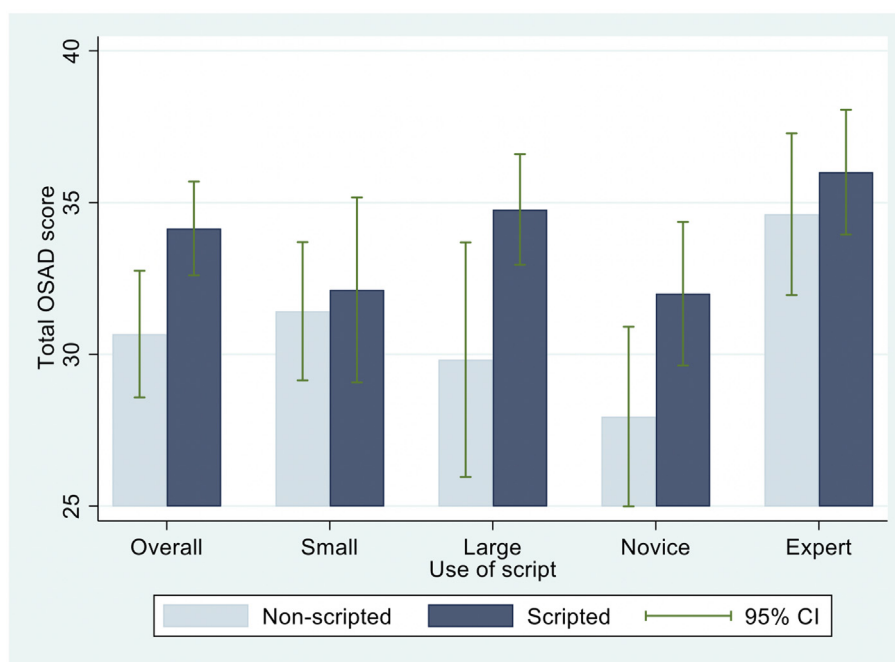
Fig. 3 – Observational Structured Assessment of Debriefing (OSAD) scores according to trial groups and their subgroups.

use of scripts in large-scale resuscitation courses involving debriefing.

Paediatric resuscitation, or life-support, courses have become a mandatory requirement for specialist colleges in many parts of the world.[19–21] Simulated scenarios have become a mainstay feature of these courses, as they offer the ability to efficiently teach and assess participants on both technical and non-technical skills.[22,23] Given the increasing demand for these courses internationally, fac-

ulty are often inexperienced in debriefing with consequent risk of heterogeneity of learning outcomes or even psychological harm.[24,25] The provision of scripts is a way of standardising these debriefs, ensuring that faculty are prepared and can deliver a safe, high quality debrief. A high quality debrief is an important element to ensure learner outcomes are met, including maintaining a culture of psychological safety and facilitating transfer of conceptual knowledge and skills.[26]

Table 3 – Observational Structured Assessment of Debriefing (OSAD) tool rankings by treatment group, stratified by experience.

	Novice				Expert			
	Non-scripted (Mean SD) (N = 19)	Scripted (Mean SD) (N = 14)	Between group differences (Mixed effects linear regression; 95% CI)	P-value	Non-scripted (Mean SD) (N = 13)	Scripted (Mean SD) (N = 18)	Between group differences (Mixed effects linear regression; 95% CI)	P-value
Outcomes								
OSAD Total	27.9 (6.1)	32.0 (4.1)	4.1 (0.5 to 7.7)	**P = 0.03**	34.6 (4.4)	36.0 (4.1)	1.3 (−2.4 to 5.1)	P = 0.48
OSAD Approach	4.2 (0.9)	4.7 (0.5)	0.5 (0.0 to 1.0)	**P = 0.04**	4.9 (0.3)	4.7 (0.7)	−0.3 (−0.9 to 0.4)	P = 0.48
OSAD Environment	3.1 (1.4)	4.1 (0.9)	0.9 (−0.1 to 1.8)	P = 0.07	4.6 (0.7)	4.2 (0.9)	−0.3 (−1.3 to 0.7)	P = 0.55
OSAD Engagement	3.9 (1.0)	4.0 (0.8)	0.1 (−0.5 to 0.7)	P = 0.74	4.5 (0.7)	4.6 (0.6)	0.1 (−0.4 to 0.5)	P = 0.74
OSAD Reflection	3.1 (1.0)	3.9 (0.9)	0.8 (0.2 to 1.4)	**P = 0.01**	3.9 (1.2)	4.4 (0.8)	0.6 (−0.3 to 1.5)	P = 0.17
OSAD Reaction	3.6 (1.0)	3.6 (1.2)	0.1 (−0.7 to 0.8)	P = 0.86	3.8 (1.4)	4.5 (1.0)	0.7 (0.0 to 1.4)	**P = 0.04**
OSAD Analysis	3.3 (1.1)	3.6 (0.9)	0.3 (−0.3 to 1.0)	P = 0.34	3.9 (1.0)	4.6 (0.5)	0.6 (0.1 to 1.1)	**P = 0.01**
OSAD Diagnosis	3.8 (1.1)	4.1 (0.7)	0.3 (−0.4 to 0.9)	P = 0.40	4.6 (0.5)	4.7 (0.5)	0.0 (−0.4 to 0.4)	P = 0.97
OSAD Application	3.1 (1.2)	4.0 (1.2)	0.9 (0.1 to 1.8)	**P = 0.02**	4.3 (0.8)	4.3 (1.0)	0.0 (−0.8 to 0.7)	P = 0.97

Abbreviations: Standard deviation, SD; Confidence interval, CI.

Debriefing a simulation is a complex skill that can take years to master.[27,28] There are many components to a model debrief, which requires gauging participant reactions and responding with high levels of communication. Scripts are a safeguard to ensure that important elements are covered, which may otherwise be overlooked. Unsurprisingly, the implementation of scripted debriefing for a paediatric resuscitation course in this trial improved the quality of debriefing by novices.

Scripted debriefing was noted to improve several OSAD domains, including 'approach', 'reflection', and 'application'. The approach to debriefing should include establishing rapport and using a frank but non-threatening discussion of events, to ensure psychological safety of participants.[24] Psychological safety is the shared belief held by members of a team that the team is safe for interpersonal risk taking, which aims to empower individuals to perform during a simulation and engage in the debrief.[25] It is important for learners to be prompted to self-reflect on the simulation events, which should be conducted systematically. Additionally, the key learning points from the simulation should be highlighted to the participants, with application to their clinical practice.

Scripted debriefing predictably improved the overall OSAD scores for novice debriefers, the target group for this trial. This is in keeping with the trial hypothesis that the use of scripts can fast-track novice debriefers' ability to provide higher quality debriefs to simulated scenarios. This is likely in part due to providing a cognitive aid for novice debriefers to reduce cognitive load. In this trial, scripts appeared to assist in some domains and not others, which may require broader training and experience that scripts cannot provide. Conversely, scripts did not improve the quality of debriefs performed by expert debriefers. This was in part that these experienced debriefers already had observed high OSAD scores, which limited the size of any potential improvement.

OSAD scores were noted to improve with scripted debriefing at large sites. Large site in this trial had a higher proportion of scripted debriefing, which may have exposed more novices to use of scripts. However, it is unclear why small sites did not show the same improvement in OSAD scores but may also have been related to fewer sites having novice debriefers using scripts.

Importantly, scripts did not worsen the OSAD scores for experienced debriefers, with no harm observed. There are several risks of introducing a standardised script for paediatric resuscitation courses. Referring to a script could potentially detract from the debriefer's eye contact and engagement with participants. If read directly, some of the sections may come across as rigid or lacking empathy. The scripts may stifle creativity or may cause the debriefers to be sidetracked or forget certain points they were going to raise. Additionally, they could potentially increase extraneous cognitive load for experienced debriefers. However, the improvement in OSAD scores and high ratings in these OSAD domains, suggests that these issues were not perceived during scripted debriefings.

We were able to demonstrate that scripts improved the quality of debriefing of paediatric simulated resuscitation scenarios. However, we did not evaluate the impact of the scripts on the debriefers themselves (e.g. cognitive load) or measure their satisfaction with using them (i.e. acceptability). Although there was an improvement in overall OSAD scores, we did not link this with learner outcomes. Besides these, future directions could also include the evaluating the use of scripts by novices for other health care simulation courses or settings.

Strengths and limitations
Strengths of the study included it being a large, multicentre randomised trial, which would help to reduce systematic and selection

bias. Additionally, this trial was successfully conducted across a vast geographic region with inclusion of rural and remote sites, improving the generalisability of the results. The main limitation to this trial was the inability to truly blind debriefers and data collectors to scripted debriefing. STORK faculty assessing the simulation debriefing would likely have noticed an emerging pattern of similarity in the debriefs. However, we did not analyse how closely participants followed the scripts, which may have been largely ignored by experienced faculty. We had initially intended on video recording each debrief, but it became apparent that this was confronting for many of the debriefers and was resource intensive, impacting on recruitment. The control sites were provided with the PEARLS debriefing tool, for which we were unable to determine what effect this had on the quality of the standard debriefs. Only 19 of the 30 randomised sites recruited, which reflects this being a 'real-world' trial and, given this was unpredictable, this is unlikely to have biased any of the findings. Finally, the intended sample size for recruitment was not reached, which may have impacted on the subgroup analyses for the secondary outcomes.

Conclusions

Scripts improved the quality of debriefing of paediatric simulated resuscitation scenarios, as indicated by an increase in overall OSAD scores. The positive effect was particularly evident in novice debriefers. In light of these findings, the development and provision of debriefing scripts for large-scale paediatric resuscitation courses should be considered.

Ethics and Patient Consent

Children's Health Queensland Hospital and Health Service Human Research Ethics Committee approved the trial (HREC/16/QRCH/83). Consent was obtained from all site participants.

Randomised Controlled Trials Registration

Prospectively registered ACTRN12617001196336.
https://anzctr.org.au/Trial/Registration/TrialReview.aspx?id=373359&isClinicalTrial=False.

Presentations

Trial protocol presented as an oration at the Australasian Simulation Congress, Melbourne, Australia, August 2016.

Declaration of Conflicts of Interest

None to declare.

Role of the Funding Source

This trial was unfunded.

CRediT authorship contribution statement

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Data Statement

The datasets used and/or analysed during the current study will be available from the corresponding author on reasonable request and after approval by appropriate ethics committees.

Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.resplu.2022.100291.

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R E F E R E N C E S

1. Tibballs J, Kinney S. A prospective study of outcome of in-patient paediatric cardiopulmonary arrest. Resuscitation 2006;71:310–8.

2. Meert KL, Donaldson A, Nadkarni V, et al. Multicenter cohort study of in-hospital pediatric cardiac arrest. Pediatr Crit Care Med 2009;10:544–53.

3. Waisman Y, Amir L, Mimouni M. Does the pediatric advanced life support course improve knowledge of pediatric resuscitation? Pediatr Emerg Care 2002;18:168–70.

4. Fanning RM, Gaba DM. The role of debriefing in simulation-based learning. Simul Healthc 2007;2:115–25.

5. Krogh K, Bearman M, Nestel D. "Thinking on your feet"-a qualitative study of debriefing practice. Adv Simul (Lond) 2016;1:12.

6. Cheng A, Grant V, Huffman J, et al. Coaching the Debriefer: Peer Coaching to Improve Debriefing Quality in Simulation Programs. Simul Healthc 2017;12:319–25.

7. Peterson DT, Watts PI, Epps CA, White ML. Simulation Faculty Development: A Tiered Approach. Simul Healthc 2017;12:254–9.

8. Cheng A, Hunt EA, Donoghue A, et al. Examining pediatric resuscitation education using simulation and scripted debriefing: a multicenter randomized trial. JAMA Pediatr 2013;167:528–36.

9. Ahmed M, Arora S, Russ S, Darzi A, Vincent C, Sevdalis N. Operation debrief: a SHARP improvement in performance feedback in the operating room. Ann Surg 2013;258:958–63.

10. Brett-Fleegler M, Rudolph J, Eppich W, et al. Debriefing assessment for simulation in healthcare: development and psychometric properties. Simul Healthc 2012;7:288–94.

11. Service CsHQHaH. Optimus CORE: Clinical Observation and Response to Emergencies 2022 Available from: https://www.childrens.health.qld.gov.au/chq/health-professionals/qld-paediatric-emergency-care/education/optimus-core/.

12. Australian Institute of Health and Welfare AG. Rural, regional and remote health: a guide to remoteness classification. Rural health series; 2004.

13. Health Q. Hospital Performance: Queensland Government; 1996-2022 [Available from: http://www.performance.health.qld.gov.au/. 26 Apr 2022.

14. Rudolph JW, Simon R, Dufresne RL, Raemer DB. There's no such thing as "nonjudgmental" debriefing: a theory and method for debriefing with good judgment. Simul Healthc 2006;1:49–55.

15. Eppich W, Cheng A. Promoting Excellence and Reflective Learning in Simulation (PEARLS): development and rationale for a blended approach to health care simulation debriefing. Simul Healthc 2015;10:106–15.

16. Runnacles J, Thomas L, Sevdalis N, Kneebone R, Arora S. Development of a tool to improve performance debriefing and learning: the paediatric Objective Structured Assessment of Debriefing (OSAD) tool. Postgrad Med J 2014;90:613–21.

17. Runnacles J, Thomas L, Korndorffer J, Arora S, Sevdalis N. Validation evidence of the paediatric Objective Structured Assessment of Debriefing (OSAD) tool. BMJ Simul Technol Enhanc Learn 2016;2:61–7.

18. Abegglen S, Krieg A, Eigenmann H, Greif R. Objective Structured Assessment of Debriefing (OSAD) in simulation-based medical education: Translation and validation of the German version. PLoS One 2020;15:e0244816.

19. Chandran KV, Abraham SV. Basic Life Support: Need of the Hour-A Study on the Knowledge of Basic Life Support among Young Doctors in India. Indian J Crit Care Med 2020;24:332–5.

20. Jewkes F, Phillips B. Resuscitation training of paediatricians. Arch Dis Child 2003;88:118–21.

21. Physicians RACo. Paediatrics & Child Health Training Program Requirements 2022 [Available from: https://www.racp.edu.au/trainees/basic-training/paediatrics-child-health. 26 Apr 2022.

22. von Wyl T, Zuercher M, Amsler F, Walter B, Ummenhofer W. Technical and non-technical skills can be reliably assessed during paramedic simulation training. Acta Anaesthesiol Scand 2009;53:121–7.

23. Ypinazar VA, Margolis SA. Clinical simulators: applications and implications for rural medical education. Rural Remote Health 2006;6:527.

24. Purdy E, Borchert L, El-Bitar A, Isaacson W, Bills L, Brazil V. Taking simulation out of its "safe container"-exploring the bidirectional impacts of psychological safety and simulation in an emergency department. Adv Simul (Lond) 2022;7:5.

25. Rudolph JW, Raemer DB, Simon R. Establishing a safe container for learning in simulation: the role of the presimulation briefing. Simul Healthc 2014;9:339–49.

26. Decker S, Alinier G, Crawford SB, Gordon RM, Jenkins D, Wilson C. Healthcare Simulation Standards of Best PracticeTM The Debriefing Process. Clinical Simulation in Nursing 2021;58:27–32.

27. Cheng A, Eppich W, Kolbe M, Meguerdichian M, Bajaj K, Grant V. A Conceptual Framework for the Development of Debriefing Skills: A Journey of Discovery, Growth, and Maturity. Simul Healthc 2020;15:55–60.

28. Fey MK, Auerbach M, Szyld D. Implementing Faculty Development Programs: Moving From Theory to Practice. Simul Healthc 2020;15:5–6.