

Integrating leadership into interprofessional non-acute care pediatric provider resuscitation training

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Integrating Leadership into Interprofessional Non-Acute Care Pediatric Provider

Resuscitation Training

Journal of Clinical and Translational Research

Dear Dr. Gupta,

Reviewers have now commented on your paper. You will see that they are advising that you revise your manuscript. If you are prepared to undertake the work required, I would be pleased to reconsider my decision.

For your guidance, reviewers' comments are appended below.

If you decide to revise the work, please submit a list of changes or a rebuttal against each point which is being raised when you submit the revised manuscript. Also, please ensure that the track changes function is switched on when implementing the revisions. This enables the reviewers to rapidly verify all changes made.

Your revision is due by Aug 18, 2022.

To submit a revision, go to <https://www.editorialmanager.com/jctres/> and log in as an Author. You will see a menu item call Submission Needing Revision. You will find your submission record there.

Yours sincerely

Michal Heger
Editor-in-Chief
Journal of Clinical and Translational Research

Reviewers' comments:

Editor: It's not clear how the respondents were selected; further training may benefit different categories of learners. Please expand on the methodological details. Some of the systems may be dated as many hospitals already have implemented programs in ongoing education and as the data may stem from pre-covid era, which may have accelerated some training. Please expand on this in the discussion. The statistics are very basic; is there a reason for limiting to 37 participants - a cohort that was previously published on?

Reviewer #1: The authors have extended their initial pilot study on simulation training emphasizing leadership, handoffs, and technical skills during the First Five Minutes of pediatric emergencies.

Intro: Likert should be capitalized

Methods page 2 line 28 would clarify that this hospital is in Ontario, Canada as there may be different practices internationally. The methods could be expanded using some of your 2019 pilot data, to clarify how the 37 participants came about. If you run 4-10 sessions/mo with 4-5 participants/session, this would take 1-2 mos? 37 participants in 2019, none added since? Only 37 people out of potentially 20-50 /mo? From Ref 18: total of 37 interprofessional (physician and nursing) staff were trained in 16 small group sessions over four months. Page 2 Line 35 Likert should be capitalized.

Page 5 Background: The present goal was to perform a curricular evaluation of participant learning, with the primary objective to determine whether the FFM activity resulted in development of leadership skills. That's not what was measured. You measured the participants self-assessment of skillset. Observers performing the assessment would be a more accurate measure.

Page 6: Is there data on response time of RR or code? Our own policy allows up to 10 mins for resource RN's to arrive for rapid responses to other areas of the hospital (4 contiguous buildings). No mention of electronic records: we have an Early Warning System so that our RR team (resource RN and RT) is notified of patients with "red" vital signs. Is that your practice in peds? Data is from 2019 and more electronic systems are in place now to identify high-risk patients and have them in a higher acuity setting. Clarify was this mandatory or self-selective recruitment? Did managers identify those who needed this skill? Is it part of annual recert?

Page 6 Line 54: what is "routine activity delivery"?

Page 7 Line 35: P 7 line 35 Likert capitalized here.

Do you have any data on the type of Pedi emergencies? I suspect resp > cardiac (you didn't measure application of AED),?sepsis.

Page 9 Results: Given your results, would you focus on certain groups (esp ambulatory)? Resp therapists don't need training in ball-valve masks. How were participants chosen? You give the sense that resp therapy doesn't need the technical stuff, and those with weakest skills should be prioritized.

References: AHA ECC updated in 2020: refs 7, 25 should be updated

Authors' response

We would like to thank the editors for taking the time to read and provide feedback on our manuscript. The editorial review has prompted thoughtful discussion amongst the author group and led to refinement and revision of our work. Please find below an itemized list of editor and reviewer comments along with a response from the author group and any changes made to the manuscript based on the comment.

Comment	Response	Amendment
<p><i>Editor Comment 1:</i> It's not clear how the respondents were selected; further training may benefit different categories of learners. Please expand on the methodological details.</p>	<p>The study group aimed to perform an evaluation with a broad group of non-acute care providers, to better inform generalizability of the training potential. As a result, First Five Minutes (FFM) training sessions were scheduled in various inpatient and outpatient areas of the hospital. Multi-professional providers on shift or working in the clinic were invited to participate. A schedule of training dates were also distributed to staff in each clinical area, and participants were invited to sign-up for a scheduled session as well. The point regarding training benefitting different categories of learners is excellent and worthy of further study. Our own results shown in Figure 3 of the manuscript highlight the similarities and differences in skill acquisition based on provider profession and skill type. For example, non-technical skills appear to be highly useful for all provider types, and technical skills are most useful for nurses and physicians that work in non-acute care settings.</p>	<p>Amended A new paragraph detailing FFM training scheduling, participant recruitment, and rationale has been added to section 2.3 ("Participants").</p>
<p><i>Editor Comment 2:</i> Some of the systems may be dated as many hospitals already have implemented programs in ongoing education and as the data may stem from pre-covid era, which may have accelerated some training. Please expand on this in the discussion.</p>	<p>We acknowledge that this curricular evaluation was conducted prior to the Covid-19 pandemic and the context of hospital education has likely changed. Considering this, our experience is that much of the education sparked by the pandemic has focused on infection prevention and control procedures rather than specifically targeting resuscitation education. As a result, given the flexibility of the FFM training activity, and its intent to be context-specific, it would likely be a valuable method of providing resuscitation education for non-acute care providers that align with facility infection-control standards and otherwise (e.g., finding and using the appropriate personal protective</p>	<p>Amended This point seems best suited to be presented as a limitation of the study and has been added to the "Limitations" section of section 4 ("Discussion").</p>

	equipment [PPE] as part of resuscitation performance in a specific clinical area).	
<i>Editor Comment 3:</i> The statistics are very basic; is there a reason for limiting to 37 participants - a cohort that was previously published on?	<p>Thank you for allowing us the opportunity to clarify our sample size. The 37 participants included in the study were not previously published on. The earlier publication reported largely level 1 Kirkpatrick data on acceptability of the FFM training activity in a separate pilot group ¹. The current curricular evaluation analyzed a subsequent set of participants, a total of 39, of whom 37 submitted completed data. Based on the study plan's sample size calculation, data from 34 participants would be needed to detect the clinically significant change determined a priori. We added 10% for potential dropouts/incomplete data for a total recruitment goal of 37. Thus, we terminated data collection as was required by our protocol once the final group enrolled was conducted and recruitment reached 39 participants, enabling performance of the primary analysis.</p> <p>With regards to the statistics being basic, this is true, but in our opinion, not necessarily a negative attribute. Despite their simplicity, our statistical methods are comprehensive, complete, and adequately interpret the data as it pertains to the study question. They also ensure that most readers would be able to understand and critically appraise the data themselves.</p>	No Change
<i>Reviewer 1, Comment 1:</i> Intro: Likert should be capitalized	Agreed, completed.	Amended All instances of the word "Likert" have been capitalized.
<i>Reviewer 1, Comment 2:</i> Methods page 2 line 28 would clarify that this hospital is in Ontario, Canada as there may be different practices internationally.	We agree that this information will better contextualize the study information.	Amended The location has been added to section 2.2 ("Setting").
<i>Reviewer 1, Comment 3:</i>	The "Participants" sub-section of the "Methods" section has been revised to	Amended

The methods could be expanded using some of your 2019 pilot data, to clarify how the 37 participants came about. If you run 4-10 sessions/mo with 4-5 participants/session, this would take 1-2 mos? 37 participants in 2019, none added since? Only 37 people out of potentially 20-50 /mo? From Ref 18: total of 37 interprofessional (physician and nursing) staff were trained in 16 small group sessions over four months.

describe in greater detail how the 39 participants included in the present study were recruited (39 total recruited, 37 submitted completed data for analysis). We would like to clarify that the current 39 participants are different from and subsequent to the pilot group of 37 participants (31 of whom submitted completed data) reported on in the previous publication on the FFM development ¹.

A new paragraph detailing FFM training scheduling, participant recruitment, and rationale has been added to section 2.3 (“Participants”).

The rationale for limiting data collection to the 39 participants (37 completed data points) was based on the sample size calculation described in the paper. Once the sample size was achieved and the proposed primary analysis was able to be performed, data collection was terminated as per the study protocol.

Reviewer 1, Comment 4:
Page 2 Line 35 Likert should be capitalized.

Agreed, completed.

Amended
All instances of the word “Likert” have been capitalized.

Reviewer 1, Comment 5:
Page 5 Background: The present goal was to perform a curricular evaluation of participant learning, with the primary objective to determine whether the FFM activity resulted in development of leadership skills. That's not what was measured. You measured the participants self-assessment of skillset. Observers performing the assessment would be a more accurate measure.

Thank you for this observation. We acknowledge that there are alternate, more objective and rigorous methods that may be available for the stated study question. The study group unfortunately did not have the resources necessary to pursue the methods described by the reviewer and chose the retrospective pre-post self-assessment strategy given the availability of some validity of this approach in acute care pediatrics education, as described in section 2.6 of the manuscript. To ensure that readers are aware of this point by the reviewer, it is described in the “Limitations” subsection of the “Discussion” section.

No Change

Reviewer 1, Comment 6:
Page 6: Is there data on response time of RR or code? Our own policy allows up to 10 mins for resource RN's to arrive

The rapid response team is mandated to arrive within 10 minutes of activation, and generally arrives between 5 – 10 minutes. Following a code blue activation, there are typically several nearby providers that arrive, but the complete code blue team (critical care

Amended
Descriptions of response times have been added to section 2.2 (“Setting”).

for rapid responses to other areas of the hospital (4 contiguous buildings).	personnel and crash cart) generally arrive within 3 – 5 minutes. To ensure readers have the benefit of this this contextual information, it has been added.	
<i>Reviewer 1, Comment 7:</i> No mention of electronic records: we have an Early Warning System so that our RR team (resource RN and RT) is notified of patients with "red" vital signs. Is that your practice in peds? Data is from 2019 and more electronic systems are in place now to identify high-risk patients and have them in a higher acuity setting.	Early Warning Systems in pediatrics are used variably. A large international multi-centre randomized controlled trial revealed that Early Warning Systems do not lead to reduced mortality in pediatrics, and so their implementation has not been universally adopted ² . The local institution does have an electronic health record but does not formally use an early warning system. There is education given to ward providers on reasons to activate the rapid response team, however. To ensure readers have the benefit of this contextual information, it has been added.	Amended Section 2.2 (“Setting”) has been revised to indicate the facility does not use an early warning system, but does give ward providers guidance on reasons to activate rapid response/code blue teams
<i>Reviewer 1, Comment 8:</i> Clarify was this mandatory or self-selective recruitment? Did managers identify those who needed this skill? Is it part of annual recert?	Recruitment was accomplished by both arranging scheduled training on wards and in clinics, as well as inviting potential participants by email to sign-up for scheduled training sessions. Individuals were not specifically identified based on need, experience, etc. Those on shift during the time of a scheduled training session were invited and participated if they were able to have their clinical duties covered, and the remaining participants self-scheduled and came in on their free time. As the FFM training program is in the initial development and evaluation phases, it is not yet considered part of mandatory annual training, but with appropriate data to support its effectiveness, this may be the case in the future.	Amended An extra paragraph detailing FFM training scheduling, participant recruitment, and rationale has been added to section 2.3 (“Participants”).
<i>Reviewer 1, Comment 9:</i> Page 6 Line 54: what is "routine activity delivery"?	This information is captured and better detailed in section 2.3 (“Participants”) based on other reviewer and editor comments. To avoid redundancy and lack of clarity, the sentence in question has been removed.	Amended This unclear sentence in section 2.4 (“Intervention”) has been removed. The information is instead presented in the revised version

of section 2.3
("Participants").

<p><i>Reviewer 1, Comment 10:</i> Page 7 Line 35: P 7 line 35 Likert capitalized here.</p>	<p>Agreed, completed.</p>	<p>Amended All instances of the word "Likert" have been capitalized.</p>
<p><i>Reviewer 1, Comment 11:</i> Do you have any data on the type of Pediatric emergencies? I suspect resp > cardiac (you didn't measure application of AED),?sepsis.</p>	<p>We do have some of this data from the local facility, however it is unpublished. A review of almost 10 years of facility code blue activations revealed that approximately 52% of cases were for respiratory arrest/deterioration, and less than 10% were for circulatory arrest/bradycardia. Other common emergencies included need for intubation on ward (~15%) and seizures (~10%). Our review revealed no instances of children being defibrillated on the ward, which is consistent with existing pediatric resuscitation data suggesting <10% of hospitalized children suffer cardiac arrest with a shockable rhythm³. Some of this background helped inform the curricular development aspect of the FFM training activity to not include electrical therapy for non-acute care providers.</p> <p>We would prefer not to share data that is unpublished; characterization of pediatric inpatient emergencies is described elsewhere in the literature, and some of these references are already included in the background section.</p>	<p>No Change</p>
<p><i>Reviewer 1, Comment 12:</i> Page 9 Results: Given your results, would you focus on certain groups (esp ambulatory)? Resp therapists don't need training in ball-valve masks. How were participants chosen? You give the sense that resp therapy doesn't need the technical stuff, and those with weakest skills should be prioritized.</p>	<p>This is an excellent point. There likely would be some benefit in focusing or tailoring training to certain groups. That being said, our results indicate that leadership training appears to be universally beneficial for all provider types and practice locations. Based on our experience and process of curricular development, we suggest that the training activity is administered globally to non-acute care providers perhaps with certain allowances (e.g., respiratory therapists may forgo training on respiratory skills). We would advocate that those with the weakest skills are prioritized, but it is clear from existing simulation data that the performance</p>	<p>Amended A sentence describing the author group's opinion that resuscitation training that focuses on leadership should be available to all non-acute care providers has been added to</p>

of most non-acute care providers deviates from existing resuscitation guidelines ⁴, and so we suggest planning to train/educate all non-acute care providers where possible.

the Discussion section.

Reviewer 1, Comment 13:
References: AHA ECC updated in 2020: refs 7, 25 should be updated

Thank you, these two references have been updated to reflect the most recent version of the life support guidelines from the American Heart Association (AHA).

Amended
References 7 and 25 have been revised.

References:

1. Gupta R, Fitzgibbons C, Ramsay C, Vanderheiden L, Topozini C, Lobos A-T. Development and pilot of an interprofessional pediatric resuscitation program for non-acute care inpatient providers. *Med Educ Online*. 2019;24(1):1581521. doi:10.1080/10872981.2019.1581521
2. Parshuram CS, Dryden-Palmer K, Farrell C, et al. Effect of a pediatric early warning system on all-cause mortality in Hospitalized pediatric patients: The epoch randomized clinical trial. *JAMA - J Am Med Assoc*. 2018;319(10):1002-1012. doi:10.1001/jama.2018.0948
3. Girotra S, Spertus JA, Li Y, Berg RA, Nadkarni VM, Chan PS. Survival Trends in Pediatric In-Hospital Cardiac Arrests. *Circ Cardiovasc Qual Outcomes*. 2013;6(1):42-49. doi:10.1161/CIRCOUTCOMES.112.967968
4. Hunt EA, Walker AR, Shaffner DH, Miller MR, Pronovost PJ. Simulation of in-hospital pediatric medical emergencies and cardiopulmonary arrests: Highlighting the importance of the first 5 minutes. *Pediatrics*. 2008;121(1):e34-43. doi:10.1542/peds.2007-0029

2nd Editorial decision
15-Aug-2022

Ref.: Ms. No. JCTRes-D-22-00073R1
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Resuscitation Training
Journal of Clinical and Translational Research

Dear authors,

I am pleased to inform you that your manuscript has been accepted for publication in the Journal of Clinical and Translational Research.

You will receive the proofs of your article shortly, which we kindly ask you to thoroughly review for any errors.

Thank you for submitting your work to JCTR.

Kindest regards,

Michal Heger
Editor-in-Chief
Journal of Clinical and Translational Research

Comments from the editors and reviewers: