The Effect of Simulation Training on PALS Skills Among Family Medicine Residents

James M. Gerard, MD; Scott M. Thomas, MD; Kevin W. Germino, MD; Megan H. Street, MD; Wesley Burch; Anthony J. Scalzo, MD

BACKGROUND AND OBJECTIVES: The Accreditation Council for Graduate Medical Education requires that family medicine residents receive structured skills training on pediatric advanced life support (PALS) and should learn procedures for medical emergencies in patients of all ages. Traditional methods of training family medicine residents in PALS is challenging given their limited clinical exposure to critically ill patients. The primary objective of this study was to assess the effect of a 2-hour PALS training session utilizing high-fidelity mannequins on residents’ psychomotor skills performances.

METHODS: Between February and June 2009, residents from two urban family medicine residency programs received training on four PALS procedures (bag-mask ventilation, tracheal intubation, intraosseous line placement, and cardiac rhythm assessment/defibrillation) at a university simulation center. Residents completed questionnaires to provide data on previous resuscitation training and experience. We collected self-confidence data and video recordings of residents performing the procedures before and after training. To assess retention at 6 months, we collected self-confidence data and video recordings of PGY-1 and PGY-2 residents performing the procedures. A blinded reviewer scored the video recordings.

RESULTS: Forty-seven residents completed the study. The majority of residents (53.2%) had never performed any of the procedures on a real patient. Immediately following skills training, mean overall performance improved from 39.5% (± 11.5%) to 76.5% (± 10.4%), difference 37.0% (95% CI, 33.5%–40.6%). Bag-mask ventilation and intraosseous insertion skills remained above baseline at 6-month follow-up.

CONCLUSIONS: Simulation training is beneficial for teaching PALS procedures to family medicine residents.

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The Accreditation Council for Graduate Medical Education (ACGME) requires that family medicine residents receive structured skills training in all standard current life support skills (eg, Advanced Cardiac Life Support [ACLS] and Pediatric Advanced Life Support [PALS]) and should learn procedures for both trauma and medical emergencies in patients of all ages. Traditional, clinical-based teaching of PALS skills to house staff, both in family medicine and pediatrics alike, is inherently difficult given the sporadic nature and relative infrequency of pediatric cardiopulmonary arrest and pre-arrest events. Limitations on the number of pediatric emergency department and inpatient rotations (areas where exposure to critically ill pediatric patients are most likely to occur) and resident duty hour restrictions further add to this challenge.

Despite the importance of PALS training, scarce data exist regarding the extent of this training among family medicine residents. A recent study conducted at a high-volume children’s emergency department found that family medicine residents were involved in the care of relatively few critically ill patients.
Moreover, during the 1-year study period, irrespective of field of training, the majority of residents performed no life-saving procedures, such as intubations or intraosseous line placement.³ Simulation has been widely adopted as a training and assessment tool in medical education. It is particularly useful as an adjunct for teaching skills needed to manage rare or critical events, such as cardiopulmonary arrest.⁴ To date, few studies have addressed the use of simulation for teaching critical care procedures to family medicine residents. These studies have focused on neonatal and adult procedures.⁵⁻⁸ A recent study that included neonatal resuscitations showed that simulation training improved residents’ confidence to perform critical care and procedural skills.⁵ Another study that included objective assessment of skills performance showed that mannequin-based booster training was ineffective at reinforcing residents’ neonatal resuscitation skills.⁶ Data evaluating the use of simulation to teach PALS procedures to residents in this field are lacking.

We therefore conducted the present study to longitudinally evaluate the use of simulation training to teach PALS procedural skills to family medicine residents. We compared self-confidence and skills performance before, after, and at 6 months following PALS simulation training. In addition, we assessed residents’ previous resuscitation training and experience, the association between their self-confidence and actual skills performance, and their beliefs regarding the educational benefit of the simulation training.

Methods

Study Design and Setting

The Institutional Review Board at Saint Louis University approved our study. Between February and June 2009, residents participated in a single, 2-hour PALS procedural training session conducted at the Saint Louis University Simulation Center. Training was conducted in a small-group format with three to four residents per session. This training was a supplement to existing clinical-based, mock code, and didactic PALS training curricula. At each session, two of the study investigators taught four PALS procedures (bag-mask ventilation, tracheal intubation, intraosseous line placement, and cardiac rhythm assessment/defibrillation) utilizing METI Ped HPS®, Pedi-SIM®, BabySIM®, and Laerdal® IO mannequins. In addition, we used a METI adult HPS® mannequin to highlight anatomical differences between the pediatric and adult airway. Instructors demonstrated proper technique for each of the procedures. Residents were then allowed time for individual, supervised deliberate practice on each of the procedures. At the end of each session, residents participated as a group in a standardized pediatric mock code that required that all of the procedures be performed.

Before the start of each training session and at 6-month follow-up, residents completed written questionnaires to provide previous resuscitation training and experience with performing resuscitation procedures on patients from four age groups (neonate, infant, pediatric, and adult). We instructed subjects to exclude any courses or procedures performed prior to residency and any procedures that they observed but did not themselves perform. In addition, they completed a written questionnaire rating their self-confidence to perform the procedures of interest on patients in each of the age groups. For this study, we defined self-confidence as the “belief in your ability to competently perform the procedure on a real patient with a reasonably high chance of success.” Subjects rated their responses on a 100-mm visual analog scale with 5 reference points ranging from 0 (very little) to 100 (quite a lot). We re-administered the self-confidence questionnaire to subjects immediately after completion of each training session and at 6-month follow-up. For each subject, we recorded an overall self-confidence score (the average of all scores for each procedure for each age group) as well as self-confidence scores for each individual procedure.

Psychomotor Skills Performance Data

To assess psychomotor skills, we made videos of subjects individually performing the four PALS procedures. The video recording protocol is similar to one that we developed.
for a previous study to evaluate the educational efficacy of a Web-based PALS course. This protocol is modified from one previously described by White et al and Quan et al. Subjects were given a single opportunity to perform each procedure. To allow residents to focus their attention on being thorough and technically correct during the evaluations, performances were not timed. We recorded subjects immediately prior to and after each training session and at 6-month follow-up.

The video recording sessions took place in a simulated emergency room at the Saint Louis University Simulation Center. The room setup was identical for each session and included METI Ped HPS® (before training) and PediaSIM® (after training and 6-month follow-up) mannequins, a Broselow® Pediatric Emergency Tape, and standard PALS resuscitation equipment. One of the study investigators served as the moderator for each session. During each taping session, the moderator asked the subject to demonstrate all of the steps needed to properly perform each of the procedures. Reading from a prepared, written script, the moderator described the scenario, the age of the patient, and the specific task to be performed, for example, “This is a 6-month old infant who is apneic, please show me all of the steps needed to perform bag-mask ventilation on this patient.” Moderators were instructed not to lead or prompt the subjects in any way during the sessions. The patient age and type of arrhythmia were changed for the post-training and 6-month follow-up video recording sessions.

At the end of the study, a blinded reviewer scored the video recordings. The reviewer, a board certified pediatric emergency medicine physician, certified PALS instructor, and former PALS program director at a university-affiliated, pediatric medical center was not involved in any aspect of designing or conducting the study and had no knowledge of the training status of subjects or the hypothesis being tested.

To score each performance, the reviewer used a 29-item score sheet identifying key subcomponents of the four procedures. Each subcomponent is listed as a specific teaching point within the PALS instructor manual and is considered important for the optimal performance of each procedure. In our previous study, using the classification scheme of Landis and Koch, we demonstrated acceptable inter-rater agreement for the score sheet. To score a subcomponent as being performed properly, it had to be performed correctly and at an appropriate time in the given scenario. No partial credit was given.

Upon completion of video scoring, study investigators tabulated the score sheets. For each subject, we recorded an overall score (the percentage of all correctly performed subcomponents) as well as scores for each individual procedure.

**PALS Skills Training Survey**

At the end of each training session, to elicit feedback on the training, subjects completed a structured survey that addressed various aspects of the training. Subjects rated their responses on a 100-mm visual analog scale with 5 reference points ranging from 0 (strongly disagree) to 100 (strongly agree).

**Statistical Analysis**

For skills performance, based on data from our Web-PALS study, we calculated that with 30 subjects we would have 80% power to detect an 8% difference in the mean overall score between any two of the three testing groups at the .05 significance level. Self-confidence, mean overall scores, and mean scores for each procedure were compared using repeated measures ANOVA with the Bonferroni adjustment for multiple comparisons. This approach allowed us to assess changes over time while minimizing the chance of a Type I error. Pearson correlations were used to assess the association between PALS skills and self-confidence. A 2-tailed $\alpha$ of .05 was considered statistically significant for all analyses.

For ease of reporting, scores have been converted from 100-mm analog scales to 0–5 scales. Power analyses were performed using S-Plus Version 4.5 (Insightful Co, Seattle). All other analyses were performed using SPSS version 15 (SPSS Inc, Chicago).

**Results**

Forty-seven of 60 eligible residents (16 PGY-1, 20 PGY-2, 11 PGY-3) participated in the training sessions and study. Six PGY-3 residents declined to participate in the training sessions and were thus not enrolled in the study. Due to scheduling conflicts, seven residents (four PGY-1, three PGY-3) could not participate in the training during the study period. They ultimately attended training sessions but were not enrolled in the study. Of the 47 study participants, 89% had completed at least one of their rotations at SSM Cardinal Glennon Children’s Medical Center (mean=1.9, median=2, range 0–4). Among PGY-1 and PGY-2 residents, 86% had completed at least one of their rotations at Cardinal Glennon (mean=1.8, median=2, range 0–4). All 36 of the eligible residents returned for the 6-month follow-up. The mean elapsed time between training sessions and follow-up was 208 days (range 182–286 days). Due to an unrecognized, irreparable videotape defect, the follow-up skills performances at one of the sessions were inadvertently not recorded for six of the residents (four PGY-1, two PGY-2). Their self-confidence data are included for analysis. Thirty residents are therefore included for the 6-month follow-up analysis of skills performance (12 PGY-1, 18 PGY-2).

Previous resuscitation training reported by the study subjects is shown in Table 1. Only six residents (12.8%) reported having taken a PALS course. Five residents (10.6%) each reported previously receiving 1 hour of pediatric simulation training. Thirty-four residents (72.3%) reported that they had never participated in a pediatric mock code.
Residents’ previous procedural experience for each of the age groups is shown in Table 2. Twenty-seven (57.4%) residents had never performed bag-mask ventilation on a non-adult patient. Thirty-six (76.6%) residents had never intubated a non-adult patient. Forty-six (97.9%) residents had never defibrillated nor placed an intraosseous line in a non-adult patient.

When all residents were included for analysis, immediately following skills training, mean overall performance improved from 39.5% (± 11.5%) to 76.5% (± 10.4%), difference 37.0% (95% CI, 33.5%–40.6%). Improvements were seen for each of the individual procedures. Mean pre- and post-simulation training overall and individual procedure scores were similar for the 6-month follow-up group when compared to the non-follow-up group. Longitudinal skills performances for the 30 PGY-1 and PGY-2 residents are shown in Table 3. Overall skills performance remained above baseline at 6-month follow-up owing to continued improvement in the bag-mask ventilation and intraosseous insertion procedures.

When all residents were included for analysis, immediately following skills training, self-confidence improved for all of the procedures for all age groups. Longitudinal self-confidence data for the 36 PGY-1 and PGY-2 residents are shown in Table 4. At 6-month follow-up, self-confidence remained above baseline for all of the procedures for all age groups.

For the overall skills performance versus self-confidence regression analyses, a weak positive correlation was found prior to training (R=0.45). No practical association was found for the post-simulation training (R=0.15) or 6-month follow-up (R=0.07) analyses. We found no practical association between skills performances and self-confidence for any of the individual procedures for the post-simulation training and 6-month follow-up analyses (median R=0.06, range 0.04–0.28).

Results of the PALS skills training survey are shown in Table 5. As a group, residents strongly agreed that the training sessions were beneficial, allowed sufficient time to practice each of the skills, and that this training should be required during family medicine residency.

### Discussion

Throughout their careers, most family physicians and general pediatricians will have little, if any, need to perform PALS procedures. Previous studies have shown, however, that though rare, pediatric emergencies including respiratory failure and cardiac arrest do occur in family...
### Table 3: Psychomotor Skills Performances Before, After, and at 6 Months Following Skills Training* (n=30)

<table>
<thead>
<tr>
<th>PALS Procedure</th>
<th># of Sub-components</th>
<th>Before Training</th>
<th>After Training†</th>
<th>6-month Follow-up</th>
<th>Change From Baseline at 6 Months (95% CI)</th>
<th>P Value‡</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bag-mask ventilation</td>
<td>8</td>
<td>43.3 (22.2)</td>
<td>73.3 (16.3)</td>
<td>66.7 (14.4)</td>
<td>23.4 (14.1–32.6)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Tracheal intubation</td>
<td>9</td>
<td>36.7 (22.4)</td>
<td>82.6 (18.6)</td>
<td>41.1 (19.6)</td>
<td>4.4 (-5.2–14.1)</td>
<td>.75</td>
</tr>
<tr>
<td>Intraosseous insertion</td>
<td>5</td>
<td>32.7 (22.6)</td>
<td>80.0 (11.7)</td>
<td>52.0 (20.1)</td>
<td>19.3 (5.2–33.4)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Defibrillation</td>
<td>7</td>
<td>44.3 (16.5)</td>
<td>76.2 (15.2)</td>
<td>53.3 (17.2)</td>
<td>9.0 (-2.0–20.1)</td>
<td>.14</td>
</tr>
<tr>
<td>Overall</td>
<td>29</td>
<td>40.3 (12.2)</td>
<td>78.0 (8.4)</td>
<td>53.0 (12.0)</td>
<td>12.7 (7.5–17.8)</td>
<td>&lt;.05</td>
</tr>
</tbody>
</table>

* Data are given as percentages of correctly performed subcomponents for video-recorded procedures.
† Post-training scores were higher than pre-training scores overall and for each individual procedure (P=.00 for all comparisons).
‡ P values are for the change from baseline at 6 months.

### Table 4: Self-confidence to Perform PALS Procedures Before, After, and at 6 Months Following Skills Training* (n=36)

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Before Training</th>
<th>After Training†</th>
<th>6 Months Following Training</th>
<th>Change From Baseline at 6 Months (95% CI)</th>
<th>P Value‡</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bag-mask ventilation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neonate</td>
<td>2.0 (1.0)</td>
<td>3.4 (0.5)</td>
<td>2.8 (0.8)</td>
<td>0.8 (0.5–1.3)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Infant</td>
<td>2.1 (1.0)</td>
<td>3.6 (0.4)</td>
<td>2.9 (0.8)</td>
<td>0.8 (0.4–1.2)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Pediatric</td>
<td>2.1 (1.1)</td>
<td>3.7 (0.4)</td>
<td>3.0 (0.9)</td>
<td>0.9 (0.5–1.3)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Adult</td>
<td>3.3 (0.8)</td>
<td>3.8 (0.5)</td>
<td>3.8 (0.7)</td>
<td>0.5 (0.1–0.9)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Tracheal intubation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neonate</td>
<td>1.0 (0.9)</td>
<td>3.0 (0.7)</td>
<td>1.8 (0.9)</td>
<td>0.8 (0.4–1.3)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Infant</td>
<td>1.0 (0.9)</td>
<td>3.2 (0.7)</td>
<td>1.9 (0.9)</td>
<td>0.9 (0.4–1.4)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Pediatric</td>
<td>1.2 (1.0)</td>
<td>3.4 (0.5)</td>
<td>2.1 (1.0)</td>
<td>0.9 (0.4–1.4)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Adult</td>
<td>2.5 (1.1)</td>
<td>3.6 (0.6)</td>
<td>3.2 (1.0)</td>
<td>0.7 (0.2–1.0)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Intraosseous insertion</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neonate</td>
<td>0.7 (1.1)</td>
<td>3.2 (0.6)</td>
<td>2.2 (1.0)</td>
<td>1.5 (1.0–2.0)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Infant</td>
<td>0.6 (0.8)</td>
<td>3.1 (0.6)</td>
<td>2.2 (1.0)</td>
<td>1.6 (1.1–2.1)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Pediatric</td>
<td>0.6 (0.8)</td>
<td>3.2 (0.6)</td>
<td>2.3 (1.0)</td>
<td>1.7 (1.2–2.2)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Adult</td>
<td>0.8 (1.0)</td>
<td>2.9 (0.9)</td>
<td>2.3 (1.0)</td>
<td>1.5 (1.0–2.0)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Defibrillation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neonate</td>
<td>0.8 (1.0)</td>
<td>2.9 (0.9)</td>
<td>1.7 (1.0)</td>
<td>0.9 (0.4–1.4)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Infant</td>
<td>0.8 (0.7)</td>
<td>3.0 (0.7)</td>
<td>1.8 (1.0)</td>
<td>1.0 (0.5–1.5)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Pediatric</td>
<td>0.8 (0.7)</td>
<td>3.1 (0.7)</td>
<td>2.1 (1.0)</td>
<td>1.3 (0.8–1.7)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Adult</td>
<td>2.5 (1.1)</td>
<td>3.5 (0.7)</td>
<td>3.1 (1.0)</td>
<td>0.6 (0.0–1.1)</td>
<td>&lt;.05</td>
</tr>
</tbody>
</table>

* Original responses were given on a 0–100 mm visual analog scale. For ease of reporting, data have been converted to a 0 (very little) to 5 (quite a lot) scale.
† Post-training self-confidence was higher than pre-training self-confidence for all of the procedures for all age groups (P=.00 for all comparisons).
‡ P values are for the change from baseline at 6 months.
physician and pediatric office-based settings.\textsuperscript{14,15} The importance of preparing all physicians in the initial treatment of these life-threatening events is reflected in ACGME guidelines\textsuperscript{1,16} and expert consensus.\textsuperscript{17,18} Given the low incidence of pediatric cardiopulmonary arrest, residents in both family medicine and pediatrics alike may not receive sufficient training on PALS skills on a clinical basis alone. Previous studies have demonstrated the positive effects of utilizing simulation as an adjunct to teach PALS skills to pediatric residents.\textsuperscript{19,20}

To our knowledge, this is the first study to objectively evaluate the use of simulation to teach PALS procedures to family medicine residents. The primary objective of our study was to assess the effect of a 2-hour PALS training session on residents’ psychomotor skills performances. We found that skills performances improved significantly for all of the procedures immediately following the training sessions. This is consistent with previous reports on the effect of PALS training.\textsuperscript{11,19,20} Previous studies have shown that following resuscitation training, psychomotor skills significantly decay over time.\textsuperscript{21–23} We found this to be true for the intubation and defibrillation procedures. We were encouraged to find, however, that bag-mask ventilation and intravenous insertion skills remained above baseline at 6-month follow-up. These findings support the use of simulation to teach PALS skills to family medicine residents. They also suggest that training should occur more frequently than at 6-month intervals to ensure adequate reinforcement and retention of the more complex intubation and defibrillation skills.

A secondary goal of our study was to evaluate residents’ clinical experience with performing these procedures. Congruent with previously published data\textsuperscript{3} and our own experience in this field, we were not surprised to find that few residents had performed these procedures on actual patients. Family medicine residents are expected to learn many diverse skills during their training.\textsuperscript{17} Their exposure to critically ill pediatric patients is understandably limited. As in other fields, simulation can be used as an adjunct to ensure that all residents receive adequate training on these low-frequency but potentially life-saving procedures. Consistent with previous studies that have reported high satisfaction with hands-on training,\textsuperscript{5,24,25} PALS simulation training was well received by residents in our study.

Finally, we sought to correlate residents’ self-confidence with observed skills performance. Overall we found that residents were not able to accurately self-assess their PALS procedural skills abilities. For example, at 6-month follow-up, residents continued to report self-confidence levels above baseline for the intubation and defibrillation procedures despite a return to baseline in their skills performances. This result reinforces earlier research about the inaccuracy of self-assessments of professional competence in contrast with independent, objective evaluations.\textsuperscript{26–28} Congruent with these reports, our findings raise the concern that residents may become overconfident in their abilities following training sessions and support the belief that residents should be objectively evaluated during simulation training to ensure that they achieve and maintain a high skill level commensurate with their confidence to perform these procedures.

**Limitations**

This study is limited in that it comprises family medicine residents who received their tertiary pediatric training primarily at a single medical center. We suspect that others struggle with the same issue of ensuring adequate PALS training to all residents, particularly those with limited clinical exposure. The deficiencies in training and actual clinical experience found in our study, however, may not be generalizable to residents who train in other programs. In addition, there is the potential for recall bias given the self-reporting nature of the questionnaire instruments used in this study.

Also, at the time of study enrollment, five PGY-1 residents had not completed a pediatric rotation at our hospital. Though we believe this did not affect the overall direction of our

### Table 5: Responses to PALS Simulation Training Survey\(^*\) (n=47)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Mean (SD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>The training session was a beneficial educational activity.</td>
<td>4.3 (0.4)</td>
<td>3.5–5.0</td>
</tr>
<tr>
<td>The training session allowed sufficient time to practice each skill.</td>
<td>4.3 (0.5)</td>
<td>3.5–5.0</td>
</tr>
<tr>
<td>The training session was stressful.</td>
<td>2.1 (1.2)</td>
<td>0–4.8</td>
</tr>
<tr>
<td>I would like to spend more time in a pediatric skills simulation lab.</td>
<td>3.9 (0.8)</td>
<td>1.5–5.0</td>
</tr>
<tr>
<td>PALS skills simulation training should be required during family medicine residency.</td>
<td>4.4 (0.6)</td>
<td>2.6–5.0</td>
</tr>
</tbody>
</table>

* Original responses were given on a 0–100 mm visual analog scale. For ease of reporting, data have been converted to a 0 (strongly disagree) to 5 (strongly agree) scale. For clarity of presentation, the wording of some questions has been slightly altered from the original survey.
results, enrolling these residents prior to any tertiary training may have resulted in somewhat lower self-confidence and performance scores. Moreover, our study group is a mixture of residents in different years of training. Though none were found, our study is underpowered to detect differences between residents in different years of training. We cannot draw conclusions about differences in skill level or self-confidence that might exist between different classes of residents.

Our study is limited by the artificial nature of mock resuscitation scenarios. Though previous studies have shown positive effects of life support training on performance during actual resuscitations, it is unknown with certainty how residents in our study would perform in a real setting. Since moderators were not blinded to the training status of subjects (eg, before, after, or 6-month follow-up), we sought to overcome this potential for bias by adhering to a strict videorecording protocol and scoring process. Moderators read from a prepared, written script and were instructed not to lead or prompt residents in any way during the recording sessions. Despite these safeguards, the potential for moderator bias in leading residents during the skills evaluations cannot be excluded.

Conclusions

Despite these limitations, our study highlights the potential benefits of using simulation to teach PALS skills to family medicine residents. Program directors and other resident educators should be aware that residents may not receive sufficient training in PALS skills on a clinical basis alone. Simulation can be used to augment this training. In our study, we found that after a 2-hour training session, residents’ skills improved for all of the PALS procedures taught and that residents retained bag-mask ventilation and intraosseous insertion skills at 6-month follow-up. Future studies are needed to determine the optimal frequency of training to ensure adequate reinforcement and retention of more complex skills such as intubation and defibrillation. Future studies should also be conducted to assess the value of simulation to train family medicine residents on other aspects of PALS not addressed in our study, such as the primary assessment of pediatric patients and resuscitation algorithms.

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CORRESPONDING AUTHOR: Address correspondence to Dr. Gerard, SSM Cardinal Glennon Children’s Medical Center, 1465 South Grand Blvd., Saint Louis, MO 63104. 314-577-5360. Fax: 314-285-4116. gerardjm@slu.edu.

References


