Title
CPR Education in Schools: A Novel Approach to Bystander CPR Disparities

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other using a more traditional, lecture-based approach, with an effort to determine the efficacy of patient simulation in Emergency Medicine Toxicology education.

**Methods:** DESIGN - Prospective, randomized study comparing performance on pre- and post-test within a specific education modality. A satisfaction survey was used to assess the participants’ subjective experience with the SIM cases. SETTING - The study was conducted at a large academic institution with a Toxicology consult service. PARTICIPANTS - Residents and medical students rotating through the toxicology department at a single academic institution, over one academic year.

**INTERVENTIONS/OBSERVATIONS** - Three toxicology cases were presented during a month-long rotation using either the SIM- or lecture-based format. For each case, participants were randomized to one of two learner groups, varying by the teaching modality applied. Knowledge gained was quantified by comparing their performance on pre- and post-test written assessments. Improvements in scores of the SIM group were compared to those of the lecture group. A survey assessing the participants’ subjective experience in the SIM cases was sent.

**Results:** A total of 22 rotators participated in the learning modules, of which 14b completed the pre-and post-tests for data collection. There was no statistical difference in pre-test scores (mean 2.62 points, p=0.43, 95% CI of -9.35 to 4.11) amongst the 2 groups. There was significant improvement in scores after both learning modalities (SIM: mean 17.21, p=0.0016, 95% CI of 7.3-27.08; Lecture: mean 9.72, p=0.0016, 95% CI of 3.9-15.5). The SIM group experienced a higher jump in their scores, compared to the lecture group (mean 10.08, p=0.0057, 95% CI 3.27-16.9). Five participants responded to the satisfaction survey and all felt that participation in SIM improved their confidence, engagement, and clinical knowledge.

**Conclusions:** While both the SIM- and lecture-based format improved toxicology knowledge, the SIM modality was more effective. This pilot study suggests that SIM can be a useful educational tool in toxicology education.

### 11 CPR Education in Schools: A Novel Approach to Bystander CPR Disparities

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**Background:** Community CPR initiatives represent an important mechanism for increasing CPR awareness, particularly in lower-income areas which tend to have a higher incidence of out-of-hospital cardiac arrest coupled with lower rates of bystander CPR. CPR education within school systems remains a novel approach to address these bystander CPR disparities.

**Objectives:** Implement a sustainable Hands-Only CPR education program in Denver and Aurora middle schools with a focus on schools in lower-income areas, and evaluate the effect of the intervention on student CPR knowledge and comfort.

**Methods:** Participants: Over 30 middle schools (grades 6-8) in the Denver and Aurora school system were offered the opportunity to participate during the 2014 calendar year based on location and proportion of lower-income population, and 16 of them agreed.

Intervention: Participants completed a pre-test survey prior to the intervention consisting of 5 questions to assess baseline CPR knowledge and a 6th question to assess overall comfort performing CPR. The classroom teacher then initiated the standardized Hands-Only CPR training session using the CPR in Schools Training KitTM, which includes an instructional DVD, 10 inflatable manikins, and additional resources for the facilitator. Participants then completed a post-test knowledge and comfort survey, identical to the pre-test survey.

Data Analysis: A McNemar’s test was performed on all aggregate paired pre-/post-test data, and chi square and unmatched pairs t-tests were performed on any aggregate unpaired data.

**Results:** Among the 16 participating sites, 12 (75%) returned training data, resulting in 1884 students trained. Analysis of pre- and post-test data demonstrated an increase in the mean number of CPR knowledge questions answered correctly from 2.22 to 4.1 (out of 5) (p<0.001). The majority of students (80.7%) felt comfortable performing Hands-Only CPR after the intervention.

**Conclusions:** Middle school students in the Denver and Aurora school system demonstrated increased knowledge and comfort with Hands-Only CPR following standardized instruction with CPR in schools training kits. Thus, a CPR education program for students is a novel yet promising way of increasing CPR awareness in areas with high incidence of out-of-hospital cardiac arrest yet low rates of bystander CPR.

### Table 1. Pre-/Post-test Survey Results

<table>
<thead>
<tr>
<th>Topic Tested</th>
<th>Correct on Pre-Test (N=1,679)</th>
<th>Correct on Post-Test (N=1,679)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Compression rate</td>
<td>273 (16.3)</td>
<td>1,041 (62.0)*</td>
</tr>
<tr>
<td>When to stop CPR</td>
<td>838 (49.9)</td>
<td>1,520 (90.5)*</td>
</tr>
<tr>
<td>Depth of compression</td>
<td>769 (46.9)</td>
<td>1,553 (92.5)*</td>
</tr>
<tr>
<td>What an AED does</td>
<td>934 (55.6)</td>
<td>1,387 (82.6)*</td>
</tr>
<tr>
<td>Correct steps of HOCPR</td>
<td>894 (53.3)</td>
<td>1,403 (83.6)*</td>
</tr>
<tr>
<td>Comfort performing HOCPR</td>
<td>932 (55.5)</td>
<td>1,358 (80.7)*</td>
</tr>
<tr>
<td>Mean Score (Questions 1-5)</td>
<td>2.22 (44)</td>
<td>4.1 (82.2)*</td>
</tr>
</tbody>
</table>

*p<0.001
† Pre-Test n=1,679, Post-Test n=1,679