CS09-03: Online Disaster Training for Clinicians and Non-Clinicians at a Children’s Hospital

PRESENTER: Phung K Pham MS

AUTHORS:
Alan L Nager MD MHA
Solomon M Behar MD
Bridget M Berg MPH
Phung K Pham MS
Jeffrey S Upperman MD
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DISCLOSURE INFORMATION
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Children are most vulnerable in disasters, yet there are gaps in healthcare systems regarding pediatric disaster preparedness.

Pediatric disaster preparedness pertains to all clinical personnel who provide direct pediatric care.

Non-clinical hospital personnel should likewise be trained to facilitate integrative efforts that help protect children from further harm (American Academy of Pediatrics, 2015; California Emergency Medical Services Authority, 2010).

- Maintenance engineers, housekeeping service workers, administrative staff, laboratory and clinical researchers, etc.
• Pediatric Disaster Resource and Training Center
  – Pediatric disaster preparedness online training course

5 modules:
• Planning: types of disasters, pediatric vulnerabilities, patient flow, identification of staff, developing response teams, supplies, language services
• Triage: triaging children during disasters, different levels of patient acuity
• Age-Specific Care: patient care considerations by group (newborn, infant, toddler, preschool, primary school, adolescent)
• Disaster Management: patient safety, transport, family reunification, infection control, evacuation
• Emergency Code Response: hospital disaster policy

• Hospital-wide completion of pediatric disaster preparedness online training course mandated since 2009
**Aim:** To better understand how clinical and non-clinical hospital personnel interface with online training for pediatric disaster preparedness

— Archival data from July 2009-August 2012 available for analysis

**Rationale:** Research on pediatric disaster preparedness training is necessary before a standardized national curriculum can be designed and implemented

**Objective:** To examine changes in knowledge acquisition of pediatric disaster preparedness among clinicians and non-clinicians
Analysis

- **Outcome:** module score (0-100 points)

- “Within” participants: module attempts (unlimited)
- “Between” participants: hospital role (clinician or non-clinician)
- “Interaction”: hospital role x module attempts

- **Analytic approach:** growth curve multi-level modeling (MLM) (applied 5 times to examine the 5 modules)
  - **Intercept:** average module score upon first attempt
  - **Slope:** average rate of score change per attempt
  - **Hospital role effect:** whether clinicians and non-clinicians differed in how they scored in first and additional attempts
  - **Cross-level interaction effect:** whether clinicians and non-clinicians had different average rates of score change per attempt
Results

• **44,115 module attempts** by 5733 participants (3686 clinicians, 2087 non-clinicians)

• Across all participants, average module score upon first attempt *(intercept)* ranged from approx. 60-80 points

• **Planning, Triage, Age-Specific Care Modules:**
  – Non-clinicians initially had lower scores than clinicians *(hospital role effect)*
    • Average difference ranged from approx. 13-16 points
  – Across all participants, average rate of score change per attempt *(slope)* ranged from approx. 1-2 points

• **Disaster Management, Emergency Code Response Modules:**
  – Clinicians and non-clinicians had different average rates of score change per attempt *(cross-level interaction effect)*
    • Non-clinicians’ scores increased per attempt by approx. 4 points in Disaster Management and by approx. 6 points in Emergency Code Response
    • Clinicians’ scores did not significantly improve from additional attempts
Conclusions

• Contribution to research literature on pediatric disaster preparedness training
  – Necessary before a standardized national curriculum can be designed and implemented

• Clinical and non-clinical hospital personnel alike can acquire knowledge of pediatric disaster preparedness
  – Key content can be reinforced or improved through successive use

• Knowledge may not necessarily translate into action
  – Notwithstanding the need for all hospital personnel to respond effectively to disasters, acquiring preparatory knowledge is a critical first step
Thank you!

For questions or comments, please E-mail:
Phung K. Pham, MS | Data Analyst | PhD Student
ppham@chla.usc.edu

Alan L. Nager, MD, MHA | Emergency Department Director
nager@chla.usc.edu
Growth Curve MLM Applied

• Baseline model (unconditional means model)
  – Fixed and random effects of the intercept

• Unconditional growth model
  – Fixed and random effects of the intercept
  – Fixed and random effects of the slope

• Conditional growth model
  – Fixed and random effects of the intercept
  – Fixed and random effects of the slope
  – Fixed effect of hospital role (clinician/non-clinician)

• Conditional growth model with cross-level interaction
  – Fixed and random effects of the intercept
  – Fixed and random effects of the slope
  – Fixed effect of hospital role (clinician/non-clinician)
  – Cross-level interaction (slope by hospital role)
# Growth Curve MLM Results

<table>
<thead>
<tr>
<th>Module</th>
<th>Best-Fitting Model</th>
<th>Fixed Effect of Intercept</th>
<th>Random Effect of Intercept</th>
<th>Fixed Effect of Slope</th>
<th>Random Effect of Slope</th>
<th>Fixed Effect of Role $^\S$</th>
<th>Cross-Level Interaction (Slope by Role) $^\S$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td>Conditional growth</td>
<td>62.16***</td>
<td>127.69***</td>
<td>1.84***</td>
<td>0.86***</td>
<td>16.24***</td>
<td>N/A</td>
</tr>
<tr>
<td>Triage</td>
<td>Conditional growth</td>
<td>70.41***</td>
<td>117.05***</td>
<td>0.97***</td>
<td>0.07</td>
<td>13.25***</td>
<td>N/A</td>
</tr>
<tr>
<td>Age-Specific Care</td>
<td>Conditional growth</td>
<td>60.28***</td>
<td>122.91***</td>
<td>0.59***</td>
<td>0.06</td>
<td>15.27***</td>
<td>N/A</td>
</tr>
<tr>
<td>Disaster Management</td>
<td>Conditional growth with interaction</td>
<td>71.09***</td>
<td>123.54***</td>
<td>3.77*</td>
<td>0.28**</td>
<td>12.62***</td>
<td>-3.77*</td>
</tr>
<tr>
<td>Emergency Code Response</td>
<td>Conditional growth with interaction</td>
<td>80.11***</td>
<td>64.60***</td>
<td>6.40*</td>
<td>N/A (Constant Slope)</td>
<td>10.95***</td>
<td>-7.45**</td>
</tr>
</tbody>
</table>

$^\S$Clinicians as the reference group. *$p < .05$; **$p < .01$; ***$p \leq .001$. 