Simulation-based Learning and Team Training: Effectiveness in Creating a Culture of Safety in a Community Hospital

Candida Uy-Bento, MA, RNC-OB, CNM and Lorraine Munoz-Cuadrado, MSN, BSN, RNC

Problem/Question and Significance:
- Shoulder dystocia, maternal hemorrhage and neonatal emergencies are among the leading causes of maternal and/or neonatal morbidity and mortality in obstetrics. Rare events such as these may result in an adverse outcome in a newborn and/or mother. More often this can also negatively impact staff morale, adding stress to an already highly charged unit.
- A perinatal patient safety strategy was instituted in a small community hospital in 2009 to prevent adverse outcomes. High-Fidelity Simulation and Team Training were utilized to address identified areas of improvement in communication, teamwork, and escalation related to response times of high-risk maternal-child emergencies.
- We sought to determine if obstetrical simulation-based learning and team training improves teamwork, communication, escalation, and response time during obstetrical emergencies.

Evidence/Findings:
- The literature suggests that simulation-based learning can be used to assess, remediate, and provide skills training for healthcare professionals, a safe, realistic setting while providing the opportunity for reflection.
- Review of literature through CINHAL (Cumulative Index of Nursing and Allied Health Literature) suggested that interprofessional teamwork and effective communication has been linked to improved patient safety for poor team performance (Freeth, et al, 2009).
- Freeth, et al demonstrated that simulation-based education improves both knowledge and understanding of interprofessional teamwork, especially in obstetrics.

Translation to Practice/Implementation:
- The Perinatal Educator, in collaboration with its Health System state of the art Simulation Center, conducted a series of obstetrical emergency simulation drills.

Curriculum specific to obstetrical emergency drills were developed addressing critical event scenarios such as shoulder dystocia, maternal hemorrhage, and neonatal emergencies. These were selected based on the frequency of occurrence and the identified learning needs of healthcare providers.

Team STEPPS (Strategies & Tools to Enhance Performance and Patient Safety) methodology developed by the Department of Defense (DoD) and the Agency for Health Care Research and Quality (AHRQ) was incorporated, allowing for opportunities to utilize teamwork and communication techniques such as Situation, Background, Assessment and Recommendation (SBAR), check-back, call-out and the two-challenge rule.

A review of the Escalation Policy and Procedures was incorporated to empower staff members to utilize when facing a critical event.

The 4-hour course consisted of a 2-hour didactic component and a 2-hour simulation component. A total of eight emergency simulation drills were conducted, involving 100 interdisciplinary healthcare workers over a seven-month period from February to August 2009 (See Table 1).

Debriefing with video replay followed each simulation allowing for correction of errors such as clinical, communication, and escalation issues that may have arose during the scenarios. The participants gained insight into their own knowledge, skills, and decision-making competency.

Several quality management initiatives resulted from the simulation programs. Equipment procurement, streamlined blood procurement, and an improved environment resulted in improved morale and confidence in managing critical obstetric events among the participants.

The teams returned to their units with improved morale and confidence in their critical event and team skills.

Subsequent critical events monitoring revealed two shoulder dystocia and six maternal hemorrhages, all with positive outcomes.

Table 1: OB Simulation Interdisciplinary Care Team

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obstetricians</td>
<td>12</td>
</tr>
<tr>
<td>Registered Nurses</td>
<td>50</td>
</tr>
<tr>
<td>Physician Assistants</td>
<td>4</td>
</tr>
<tr>
<td>OB Technicians</td>
<td>8</td>
</tr>
<tr>
<td>Patient Care Associates</td>
<td>7</td>
</tr>
<tr>
<td>Clerical Staff</td>
<td>7</td>
</tr>
<tr>
<td>Support Care Associates</td>
<td>2</td>
</tr>
<tr>
<td>Unit Management</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Recommendations/Conclusion:
- Although obstetrical simulation drills may prove to be a good risk-reduction strategy in reducing perinatal injury and death, further research is needed to explore the effectiveness of simulation-based learning in reducing sentinel events, compensation payment, and NICU admissions.

- A tour of the simulation room familiarizing the participants with the simulation environment and equipment is a must. In addition, a practice session prior to simulation may boost participants confidence and assist them in "suspension of disbelief" during the simulation process.

- Several quality management initiatives resulted from the simulation-based learning. It facilitated the development of a Shoulder dystocia form which included a detailed step-by-step description of maneuvers to deliver the baby and a more streamlined blood procurement process to avoid delays.

Evaluation/Outcomes:
- An Obstetrical Simulation Behavioral/Response Tool (OBSTR) was developed to measure the confidence level of the participants pre and post simulation utilizing a Likert Scale. The OBSTR consisted of six (6) items of which were three (3) behavioral components and three (3) response time queries.
- Analysis of the data (N=63) revealed a significant improvement in teamwork, communication, and response time to selected obstetrical emergencies. (See Figure 1-6)
- Majority responded very favorably to the class. The opportunity to exercise critical thinking, effective communication and utilization of escalation techniques in a safe environment resulted in improved morale and confidence in managing critical obstetric events among the participants.
- The teams returned to their unit with improved morale and confidence in their critical event and team skills.
- Subsequent critical events monitoring revealed two shoulder dystocia and six maternal hemorrhages, all with positive outcomes.

Figure 1: Obstetrical Simulation Behavioral/Response Tool (OBSTR). This tool demonstrates the effectiveness of simulation on teamwork, communication, escalation, and response time on three critical events.

Figure 2: Obstetrical Simulation Behavioral/Response Tool (OBSTR). This tool demonstrates the effectiveness of simulation on teamwork, communication, escalation, and response time on three critical events.

Figure 3: Obstetrical Simulation Behavioral/Response Tool (OBSTR). This tool demonstrates the effectiveness of simulation on teamwork, communication, escalation, and response time on three critical events.

Figure 4: Obstetrical Simulation Behavioral/Response Tool (OBSTR). This tool demonstrates the effectiveness of simulation on teamwork, communication, escalation, and response time on three critical events.

Figure 5: Obstetrical Simulation Behavioral/Response Tool (OBSTR). This tool demonstrates the effectiveness of simulation on teamwork, communication, escalation, and response time on three critical events.

Figure 6: Obstetrical Simulation Behavioral/Response Tool (OBSTR). This tool demonstrates the effectiveness of simulation on teamwork, communication, escalation, and response time on three critical events.