



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



### 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, escalation related to response times during 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 nature of obstetrical emergencies is such that it requires a coordinated, rapid response among staff.
- The literature suggests that simulation-based learning can be used to assess, remediate team performance before, during, and after training (Miller, et. al, 2008).
- Simulation-based learning allows health-care professionals to practice skills in a safe, realistic setting while providing the opportunity for reflection.
- Review of literatures through CINHAL (Cumulative Index of Nursing and Allied Health Literature) suggested that interprofessional teamwork and effective communication has been linked to improved patient safety with poor team performance (Freeth, et. al, 2009).
- Freeth, et. al, demonstrated that simulation-based education improve both knowledge and understanding of interprofessional team working, especially communication in obstetrics.



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- 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 the 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 staff members 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.

### Evaluation /Outcomes:

- An Obstetrical Simulation Behavioral /Response Tool (OSBRT) was developed to measure the confidence level of the participants pre and post simulation utilizing a Likert Scale. The OSBRT 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 dystocias and six maternal hemorrhages, all with positive outcomes.

Table 1: OB Simulation Interdisciplinary Core Team

Categories	Number of Participants
Obstetricians	12
Registered Nurses	56
Physician Assistants	8
OB Technicians	6
Patient Care Associates	7
Clerical Staff	7
Support Care Associates	2
Unit Management	2
<b>Total</b>	<b>100</b>

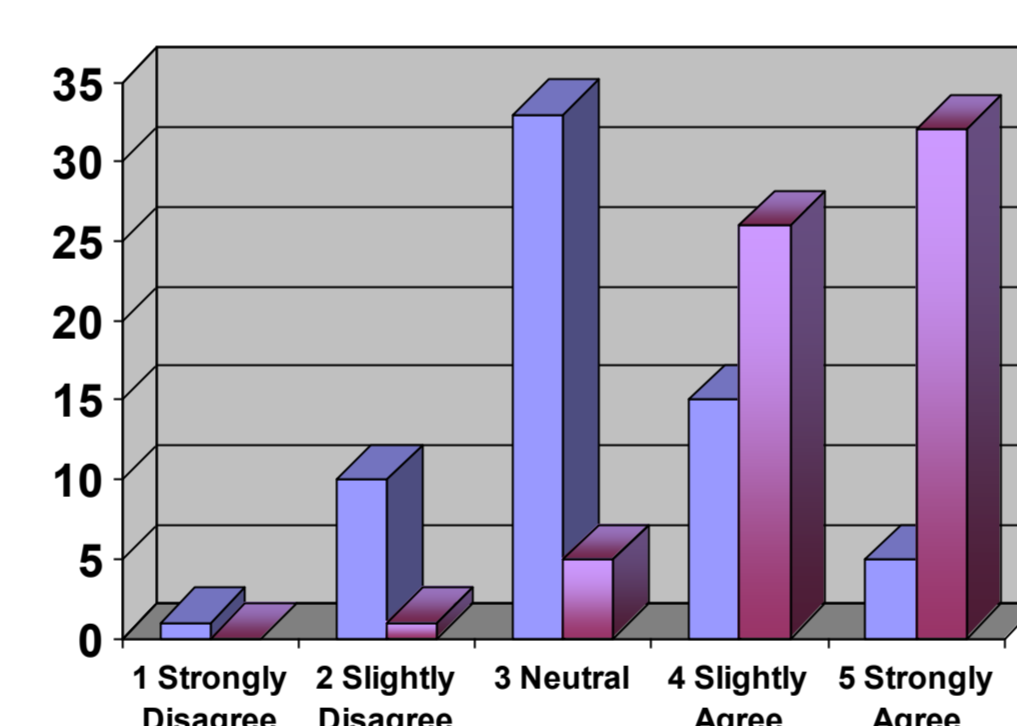


Figure 1  
■ Teamwork before simulation  
■ Teamwork after simulation

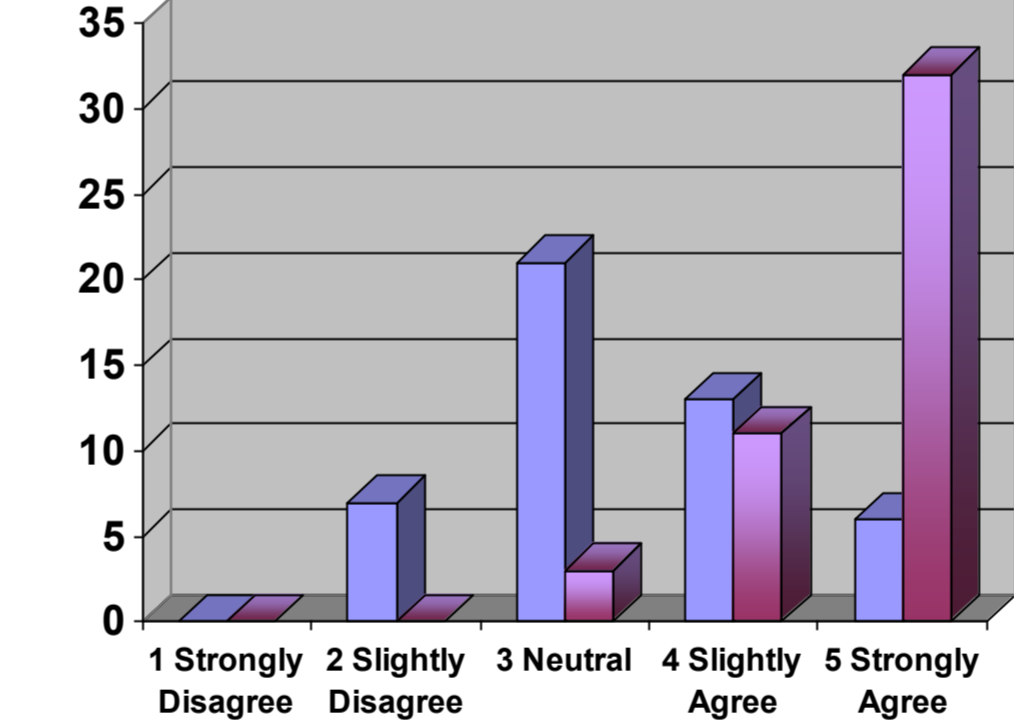


Figure 4  
■ Response time to Shoulder dystocia before simulation  
■ Response time to Shoulder dystocia after simulation

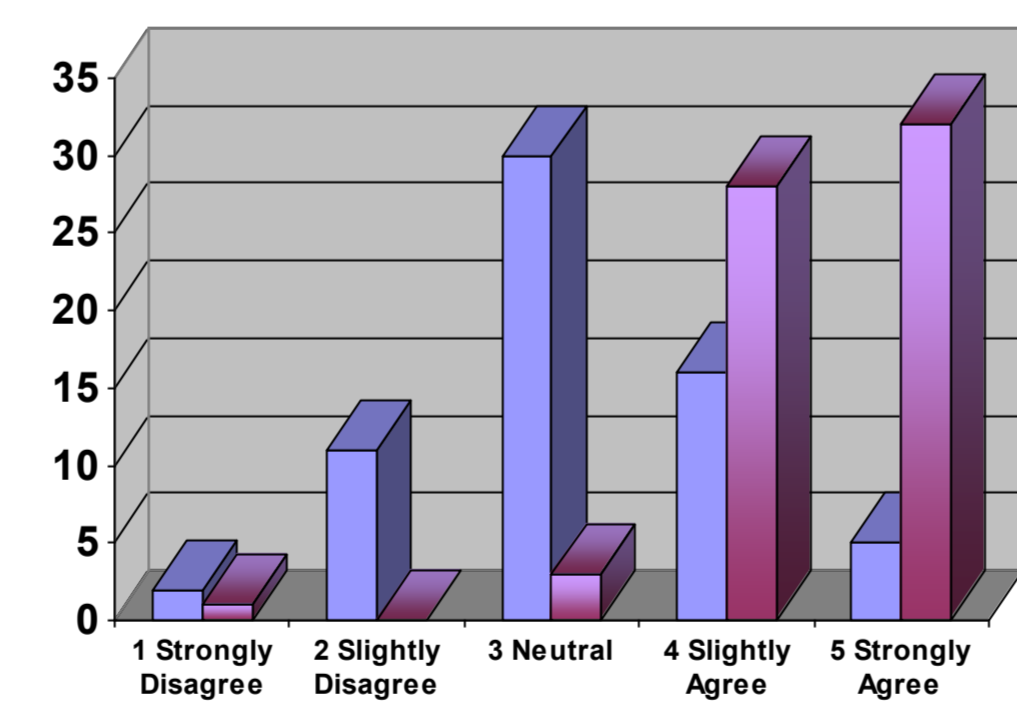


Figure 2  
■ Communication before simulation  
■ Communication after simulation

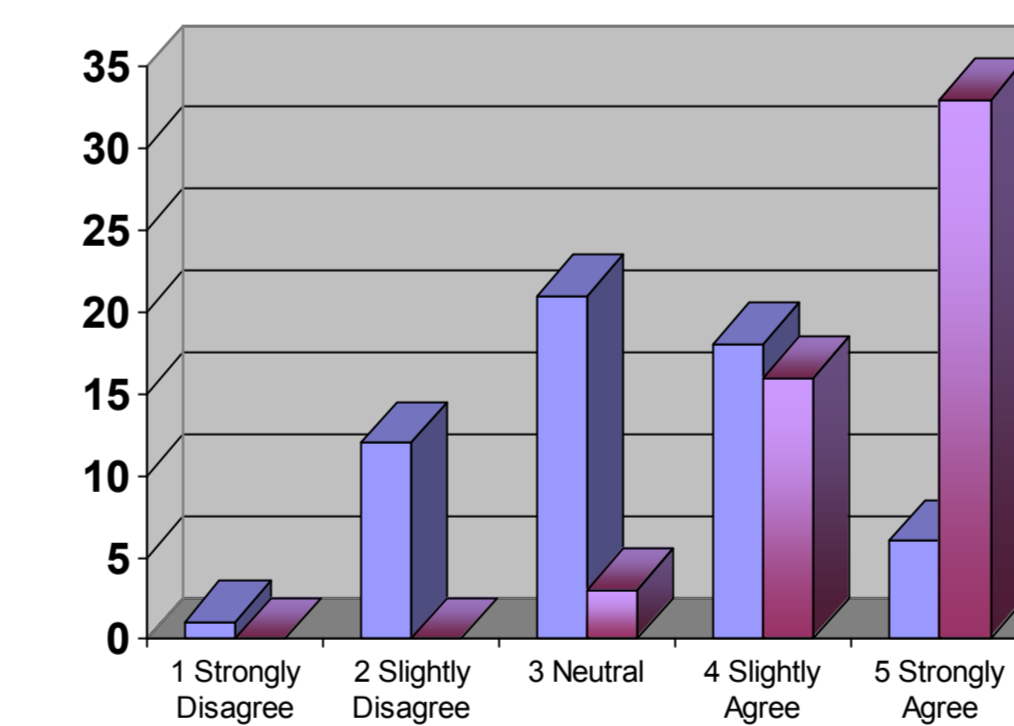


Figure 5  
■ Response time to maternal hemorrhage before simulation  
■ Response time to maternal hemorrhage after simulation

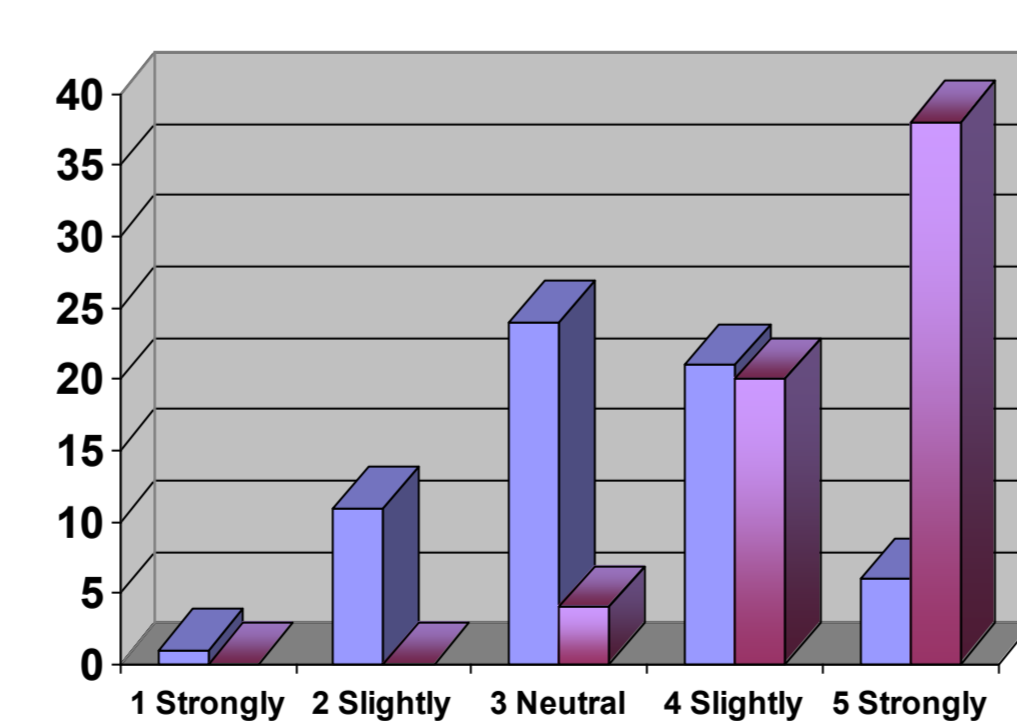


Figure 3  
■ Escalation before simulation  
■ Escalation after simulation

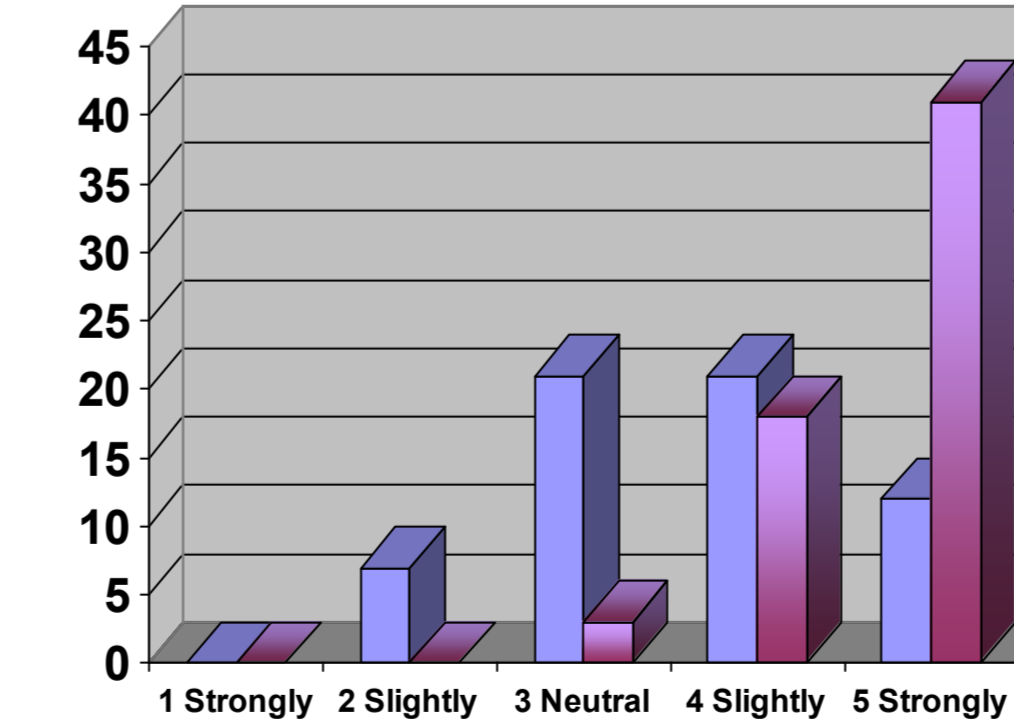


Figure 6  
■ Response time to neonatal emergencies before simulation  
■ Response time to neonatal emergencies after simulation

Figure 1-6: Obstetrical Simulation Behavioral/Response Tool (OSBRT). This tool demonstrates the effectiveness of simulation on teamwork, communication, escalation, and response time on three critical events.

### 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 to familiarize the participants with the simulation equipments and environment is a must. In addition, a practice session prior to simulation may boost participants confidence and assist them in “suspending 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.

### 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.