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Title: Simulation Training for Obstetrical Emergencies: Improving Nurse's Clinical Skills During a Shoulder Dystocia

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Introduction: Perinatal mortality and morbidity are a significant problem with the mortality rates attributed to antenatal and intrapartum complications. After reducing perinatal mortality and morbidity by way of good maternal health, obstetrical emergencies still can occur. To further decrease mortality and morbidity, health care professionals need to be properly trained to handle such emergencies.

Background and Significance: A pregnancy related maternal death has been defined as a death occurring during pregnancy or the year following the end of a pregnancy due to a pregnancy complication (CDC, 2014a). In 1987, there were 7.8 deaths per 100,000 live births, and in 2011 there were 17.8 deaths per 100,000 live births. Obstetrical emergencies identified as causing poor perinatal outcomes consist of shoulder dystocia, eclamptic seizures, postpartum hemorrhage, umbilical cord prolapse, and emergency cesarean section (CDC, 2014b).

According to the United Nations, approximately half of the mortality rate of children under five years old includes preterm birth complications and intrapartum-related complications (World Health Organization, 2016). Reducing intrapartum-related complications can be achieved by having adequately trained staff to handle the complications and evidence has shown that outcomes have improved by using simulation training programs of high and low technology (Cass, Crofts, & Draycott, 2011).

Review of Literature: From a global perspective, simulation is a common modality of training, which helps to train staff, and implement evidence-based practice (EBP) into perinatal care. The United Kingdom and Australia utilize the Practical Obstetric Multi-Professional Training (PROMPT) program using high technology simulators that mimic vital signs, fetal heart tones, uterine bleeding, etc., to simulate obstetrical emergencies (“Evidence based multi-professional training package for obstetric emergencies - Prompt Maternity,” n.d.).

Cass et al. (2011) performed a meta-analysis, which described simulation training to teach necessary skills to handle shoulder dystocia, postpartum hemorrhage, eclampsia, and umbilical cord prolapse. The shoulder dystocia data showed that 42.9% of participants were able to successfully relieve the shoulder dystocia before the training session and 83.3% after the training session. In a systematic review by Meri n, van de Ven, Mol, Houterman, and Oei (2010), the effectiveness of multidisciplinary teamwork training in a simulation setting on adverse outcomes in obstetrical emergencies were shown to improvement of knowledge, practical skills, team performance and communication. Grobman et al. (2011) assessed outcomes that were associated with the implementation of a shoulder dystocia protocol/simulation that focused on team response, which resulted in a decrease in brachial plexus injuries from 10.1% to 4.0%.

Purpose of Project: The purpose of the EBP change project was to evaluate, educate, and demonstrate improvement of clinical skills necessary to handle shoulder dystocia emergencies. The project consisted of a pretest, posttest and simulation sessions for participants using information obtained from Gnosis OB by Advanced Practice Strategies (APS) educational platform (Advanced Practice Strategies, n.d.). The desired outcomes of the project is to show improvement in knowledge and clinical skills of participants regarding shoulder dystocia.

Methods:

Project Description: The project consisted of a pretest and posttest using information obtained from Gnosis OB by Advanced Practice Strategies (APS) educational platform (Advanced Practice Strategies, n.d.). After the pre-test, a shoulder dystocia simulation was performed; followed by debriefing, an informational PowerPoint, second shoulder dystocia simulation, and finally a posttest. The desired outcomes of the project were to show improvement in knowledge and clinical skills of participants regarding shoulder dystocia.

Participants and Setting: The individuals recruited for the EBP change project are Registered Nurses of all skill/experience level and level of education from the labor and delivery (L&D) unit at the clinical facility site. The facility where the EBP change project was implemented was a tertiary hospital located in Southwestern Pennsylvania. The hospital was the first to achieve Magnet Recognition status in southwestern Pennsylvania from the American Nurses Credentialing Center and Magnet re-designation.

Implementation Steps: The first step was the recruitment process, which consisted of flyers hung on the unit, emailed to nursing and posted on the unit Facebook page with instructions on how to sign up. There was a maximum of two participants per session and the date and time offerings were weekday, weekday evening and weekends to accommodate all schedules.

The second step was the distribution and collection of the pretest via Survey Monkey. The pretest was composed of five demographic questions and 24 questions based off content from APS Gnosis Shoulder Dystocia module content.

The third step was the shoulder dystocia simulation scenarios that took place at the Simulation, Teaching and Academic Research (STAR) Center. Noelle birth simulator was the manikin available at the simulation center to simulate shoulder dystocia. A background of the patient history and current hospital situation were given to the group and then the simulation began. The group was evaluated on competency using the shoulder dystocia simulation evaluation tool created by the project manager with guidance from the Creighton Competency Evaluation Instrument (CCEI). Once the scenario was completed, there was a debriefing session.

The fourth step was the debriefing session. During this time, the participants practiced different skills and roles that allowed for feedback from the project manager unlike during the simulation. After all questions, skills and roles were worked through; participants proceeded to the PowerPoint presentation that contains information from the APS Gnosis Shoulder Dystocia module. The risks factors for, appropriate maneuvers, the role of the nurse, documentation, patient inclusion in debriefing were reviewed. The debriefing session lasted about 30-45 minutes.

The fifth step was the exact same step as the third. A second shoulder dystocia scenario was performed and the groups were evaluated using the shoulder dystocia simulation evaluation tool. The repeat simulation also lasted about 15 minutes. The last step was the distribution and collection of the posttest via Survey Monkey.

Expected Outcomes: There were two outcomes measured in this EBP change project: knowledge and competency. The level of knowledge the nurses possessed in regards to shoulder dystocia was evaluated using the pre and posttest. The outcome of competency was based on the performance of clinical skills performed during a simulation experience using the simulation evaluation tool.

Data Analysis: In order to evaluate the chosen outcomes to see if they were effective, different data analysis techniques were utilized. In order to analyze whether there was an increase in shoulder dystocia knowledge there was a comparison between the pre and posttest scores. That was done by using a dependent t-test for paired samples with a p value < 0.05. The benchmark for test scores were 80% or better, which was, based on facility continuing education standards.

The second outcome of competency of nursing skills were analyzed using the simulation evaluation tool and a pre and post intervention instrument scoring comparison. The benchmark for the tool score was 75% or better on the post intervention instrument scoring as used by the creators of the CCEI instrument. There was also a dependent t-test for paired samples with the p value < 0.05 because the pre intervention score could meet the benchmark and an improvement or lack thereof needed to be demonstrated.

Results: The results, discussion, and summary of findings are pending following completion of the EBP simulation sessions and posttest completion. The data collection phase is still ongoing at this time.

Future Implications:

Clinical Implications: The results of the EBP project can be used to better prepare and orient new labor and delivery nurses. The training can also be useful for seasoned nurses as shoulder dystocias are rare and the skills necessary are not utilized on a regular basis. The simulation trainings can become a part of an annual competency testing for the labor and delivery staff to stay sharp on those skills.

Future Projects: In the future, the EBP project can be expanded to include other disciplines. When a shoulder dystocia occurs, there is more than just nurses that are involved in the emergency. There are also attending physicians and midwives, residents from OB/GYN and anesthesia, and the NICU staff. In order to decrease adverse outcomes, increase patient safety, all members of the team need to practice for the unexpected.

Generalizability: The EBP project can be generalized to simulate and practice other obstetrical emergencies. Other emergencies that occur on labor and delivery are eclamptic seizures, cord prolapse, postpartum hemorrhage, and emergency cesarean section. Simulation training can improve the skills needed for all obstetrical emergencies, not just shoulder dystocia.

Conclusion: The obstetrical emergencies that occur are luckily a rare occurrence but that does not help to keep health care providers knowledge and skills up to date for when they do occur. Research has shown that for those incidences that do not occur on a regular basis, simulation training is effective in keeping skills and knowledge up to date and reduces adverse outcomes. The purpose of the EBP change project was to demonstrate that simulation training for shoulder dystocia could improve knowledge and competency in labor and delivery nurses. Those skills will be transitioned back real practice so that the nursing staff can be better equipped and knowledgeable when a shoulder dystocia arises.

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