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Review Article

Clinical Simulation for Practicing Labor and Delivery Nurses: Advancing Competency through Simulated Nursing Practice

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Abstract

Nurses new to Maternal-Child units in hospital organizations need reality based in-service education in new employee orientation. Experienced nurses must have current, cutting edge staff development sessions that replicate practice scenarios to facilitate currency in practice. Annual clinical skills reaffirmation and new employee orientation commonly include clinical simulation activities that enhance critical thinking, assess clinical competency and reduce the potential for errors in practice. Practice repetition in the Education Department lab setting is a protected area to learn and refine clinical care skills and procedures. Case scenarios through use of clinical simulation are posed to provide current practice initiatives that enhance the nurses' ability to provide safe, competent patient care.

Keywords: Clinical Simulation, Nurse Educators, Nurse Practice, Staff Development

Introduction

Clinical simulation is a popular teaching-learning strategy in nursing programs across the country and around the world [1,2]. Preparing nursing students for real world practice is key to their transition from student nurse to staff nurse at the bedside. Clinical simulation augments learning strategies and enhances safety in clinical practice [3]. Nurse educators have swiftly moved

to educating, supporting advanced staff development and hiring simulation experts for their nursing programs including graduate-level nurse midwifery courses. Likewise, hospital organizations have recognized the need to determine clinical capabilities of new graduate nurses upon hire. Employers must be able to educate nurses who transfer internally to a new practice setting and have a mechanism to educate their experienced staff nurses on new procedures and techniques [2,4]. This facilitates improved nursing practice and delivery of safe patient care interventions through practice repetition in a protected laboratory setting. Use of clinical simulation is used in hospital annual skills check off/ recertification days so hospital administrators can document continued competency of their nursing staff to accrediting/licensing bodies [2].

Military Use of Clinical Simulation

The U.S. Army adopted clinical simulation after determining that medical staff reservists had little experience in managing large numbers of patients with catastrophic battlefield injuries [5]. COL Richard Satava, a U.S. Army surgeon returned from the Gulf War realized medical personnel needed advanced training with massive injuries and that clinical simulation used for pilot training could be beneficial to the medical field as well. Extensive simulation-based programs were started and reservists learned how to manage multiple catastrophic injuries through repetition of clinical procedures they would see on the battlefield.

Clinical Simulation in Nursing

Nursing professionals in many different practice arenas benefit from simulation-based staff development [2]. Nurses practicing in labor and delivery, postpartum and the newborn nursery have specialized resources to maintain being engaged in cutting edge simulation learning through low fidelity simulation through case study review and use of partial task trainers such as models or manikins used to gain a specific skill such as intravenous (IV) techniques through use of a plastic IV arm or lung assessment through use of an auscultation chest [6]. Examples of medium/high fidelity manikins such as Vital Sim Anne or the birthing Noelle provides full body manikins that simulates labor and delivery. Case scenarios have been developed that use low through high fidelity simulation [2]. Based upon the desired learning outcome the degree of complexity for the clinical event is determined by the facilitator. Equally important to the learning process is the debriefing that takes place after the simulation event. Nurses learn through processing the clinical cases and by the asking and answering of questions.

Clinical Simulation in Acute Care Practice

One regional medical center uses simulation on the obstetric unit as an excellent way to evaluate the competency, communication and teamwork of nursing staff in addition to other members of the health care team such as: obstetricians, primary care physicians, residents and nurse midwives (L.A. Wallace, personal communication, March 19, 2015). According to L.A. Wallace, nurse manager of the obstetric unit, clinical simulation is used to improve the quality of care given and

patient outcomes using evidence-based practice guidelines (L.A. Wallace, personal communication, March 19, 2015). The unit manager uses low and high-fidelity simulators to perform scenarios with staff and other members of the health care team related to post-partum hemorrhage, shoulder dystocia, neonatal resuscitation and Advanced Life Support in Obstetrics (ALSO). She stated the simulation experiences provide nurses opportunities to care for clients with unexpected occurrences. After performing the scenario, debriefing takes place with all members of the health care team to evaluate the experience and discuss areas which need improvement (L.A. Wallace, personal communication, March 19, 2015).

Annual Skills Recertification

Hospitals may incorporate the use of simulation during an annual skills check off or recertification day to ensure that nurses practicing in their obstetric units have current knowledge in assessment and practice skills [6]. For example, Hospital Education Departments in conjunction with the Obstetrics Nurse Manager develop stations for nurses to demonstrate their skills and document satisfactory completion to the nurse educator. Likewise, if the nurse has further questions she can ask the expert nurse educator and learn from other nurses that may be more adept at the skill being taught.

The reader is referred to Table 1 to review common skills that are both basic and complex that a competent nurse practicing in the labor and delivery, postpartum and newborn nursery must be proficient in performing.

Table 1: Nurse Practice Skills at Annual Check Off/Recertification Day

Name of Attendee	Skill	Teaching Tool Used	Verbalizes Steps in Procedure		Demonstrates Skill		Nurse Educator Initials
			Yes	No	Yes	No	
	Proficient IV Start	IV simulation arm					
	Fetal Monitoring	High Fidelity Birthing Simulator EFM (Figure 1)					
	Assisting with Breastfeeding	Breastfeeding Baby Model					
	Leopold’s Maneuvers	Abdominal Palpation Module (Figure 2)					
	Vaginal Exam	Cervical Dilatation/ Effacement Simulators					

Figure 1: Labor and Delivery Simulation Model**Figure 2: Abdominal Palpation Model****Low Fidelity Simulation**

Low fidelity mannequins can be used as a resource to validate competency of nurses on the labor and delivery unit [2,6]. For example, a neonatal intubation head (Figure 3) can be used to simulate nursing care during a delivery with meconium stained amniotic fluid. Nurses can demonstrate how to assist the

healthcare practitioner with intubation and suctioning of the trachea in the non-vigorous newborn to decrease the incidence of meconium aspiration syndrome (MAS). This simulation could be used as an unfolding case study and develop into either a stable newborn or progress into respiratory distress requiring further resuscitation measures. Additionally, the nurse would be required to demonstrate competency following agency protocol and utilizing neonatal resuscitation guidelines to facilitate a positive outcome for the newborn following a delivery with meconium stained amniotic fluid [2, 6].

Figure 3: Newborn Intubation Head**Use of Clinical Simulators for Labor and Delivery**

Clinical facilities can use simulation to prepare staff for emergency situations on the Labor and Delivery (L&D) Unit by presenting them with an unexpected situation in the care of clients [2]. Unfolding case studies using simulation equipment is a method where nurses can participate and become skilled in responding to the unexpected. High fidelity simulation can promote critical thinking and analysis, develop decision making skills, and accentuate safe practice [7]. The use of simulation enhances the nurse's use of communication skills both with the patient and interdisciplinary team members in the acute care setting. Nurses demonstrate skills and priority nursing interventions as the case unfolds. See Figure 4 which demonstrates the use of a high-fidelity birthing simulator for a postpartum hemorrhage simulation. Programs of nursing

have concluded that combining conventional clinical practice experiences with computerized mannequin simulation scenarios augments knowledge to a higher degree than attending established clinical rotations only [8,9]. Simulation scenarios augment clinical reasoning and critical thinking skills requisite for experienced, practicing registered nurses (RN) in acute care L&D units [2,6].

Figure 4: Postpartum Hemorrhage



High Fidelity Simulation Case Study-Postpartum Hemorrhage

Objectives

The nurse will:

1. Determine steps that will be used to assess the postpartum client.
2. Demonstrate safe and effective care of the postpartum client with an unexpected occurrence.
3. Identify pertinent information related to the client's history, prenatal care, physical, psychosocial, and cultural aspects.
4. Recognize pertinent laboratory data for the postpartum client.
5. Use effective communication skills when interacting with the client, family, and interdisciplinary team members.

The nurse is assessing a 22-year-old G2 P0 client on her first postpartum day. The delivery was vacuum-assisted after being in labor for 12 hours and pushing for over two hours. The client delivered male weighing 10 pounds 6 ounces who was 21 inches in length. The nurse performs a routine postpartum assessment and 20 minutes later discovers the client's fundus is boggy. On further examination, the nurse notes that the client's peri pad and under pads are saturated with blood. The

client states that she feels weak and dizzy. Vital signs: BP-82/46, P-126, R-23, T-99.1 F

The reader is referred to Table 2 for Case Study Questions and Table 3 for Answers

Table 2: Labor and Delivery Case Study Questions

1. What are the priority nursing actions for this client?
2. What medical orders can the nurse expect?
3. Identify the predisposing factors for postpartum hemorrhage in this client.

Table 3: Suggested Answers to the Labor and Delivery Case Study Questions

1. Massage the fundus until firm and then express any clots, q10-15minute vital signs, monitor oxygen saturation and give O2 per agency policy, elevate legs to promote venous return, carefully monitor intake and output, evaluate labs Hgb/Hct, pain meds, Foley to monitor urine output, evaluate for lacerations/hematoma, ice to perineum
2. IV infusion with oxytocin, Methergine IM, IVF's to replace intravascular fluid volume, Hgb/Hct, 2 units PRBC's ready
3. Large baby, use of vacuum extractor, prolonged labor [10]

Summary

Nurse educators in schools of nursing and in acute hospital organizations have found clinical simulation to be an integral component for attaining and maintaining safe clinical performance and continued nurse competency in the specialty field of labor, delivery, postpartum and newborn care. Skills stations with varying procedures allow the nurse to practice a skill in a non-threatening environment. Practice through repetition in a secure laboratory area contributes to skill performance and nurse confidence with varying clinical assessment and practice initiatives.

Both formal nurse education programs and acute care hospital obstetric settings must employ nurses adept in use of simulation mannequins. Further, these organizations must provide nurses with low definition through high definition clinical simulation mannequins to practice and learn new techniques in the highly specialized field of labor and delivery, postpartum and newborn care. Practice repetition in a safe laboratory environment is integral to maintaining highly qualified nurse's delivery of

quality patient care.

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