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Should procedural skills be a part of the Acute Care Nurse Practitioner curriculum?

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ABSTRACT

Invasive procedures are an integral component of the time sensitive management of the acute and critically ill patients. Acute Care Nurse Practitioner (ACNP) students aspiring to be employed in their roles in the acute care settings cannot be autonomous in their practices unless they have a minimum level of proficiency to perform life sustaining invasive procedures. Offering additional level of benefits of safety and quality in healthcare, simulation as a teaching method has grown in popularity among various levels of education among variety of disciplines. Therefore, offering this opportunity to ACNP students in a controlled environment of simulation laboratory can be a win-win for the practitioner, the consumer as well as the health care industry at large. The purpose of this paper is to emphasize the importance of the role of simulation as a teaching method for invasive procedures such as Central Venous Catheterization (CVC), Arterial Catheters (AC), Thoracentesis, Paracentesis, Lumbar Puncture (LP), and Endotracheal intubation for ACNPs. One such simulation program was launched for teaching ACNP students the CVCs and ACs under ultrasound guidance. The launch of the program was overwhelmingly effective and the results of the survey of participating students showed significant improvement in their knowledge, skills and attitudes.

1. Introduction

Role of ACNPs has been embraced by the healthcare industry for multitude of reasons. Whether it is for the fast and efficient service or for quality of patient care or cost cutting reasons, ACNPs have successfully been handling the roles of acute and critical care providers exceedingly well. According to Robles et al. (2011) the Nurse Practitioners (NPs) have been effective in improving the use of resources and reducing unnecessary emergency department visits. Collins et al. (2014) also studied the impact of adding an ACNP service to a trauma unit as a pilot program and found the program to be successful in terms of decreasing hospital length of stay as well as the number of patients seen, resulting in significant cost savings for the hospital. The authors also conducted a confidential survey of attending physicians, surgeons and nurses. All the three groups of end users of ACNP services perceived improvement in patient care as well as the workflow. This is an extraordinary accomplishment, considering that the NPs have not been around for that long. The NP role emerged in the 1960's to fill the gap due to physician shortage and has quickly advanced to being a safe and reliable healthcare provider. It is not a surprise that number of states with the autonomous and unrestricted NP practice has been rapidly increasing. According to American Association of Nurse Practitioners (AANP, 2016), there are currently 22 states with full practice for NP's and many other states currently in the process of establishing the same. VanBeuge and Walker (2014), appropriately emphasized that the NP's are in a good position to provide safe, easily accessible and appropriate healthcare for all patients.

Keeping in consideration the above trends and the need for autonomous NP practice, it is imperative that the NP programs are equipped with training programs to support the education for competencies that would be essential for the job. Role of an ACNP includes management of acute changes in hemodynamic status, which are typically time sensitive as they are essential for sustaining life. Therefore, in order for ACNPs to be autonomous and efficient in their practices, it is prudent that they are competent in performing life sustaining and life-saving procedures in the acute and critical care settings. Hence, training these ACNPs to perform the skills to independently conduct the invasive procedures as a part of their training programs becomes imperative. Being cognizant of the fact that these invasive procedures such as CVC insertion, AC insertion, Thoracentesis, Paracentesis, Lumbar Puncture and Endotracheal intubation, would require a set of intricate skill development through practice and simulation can offer that opportunity for NP students. The idea of utilization of simulation training for teaching advanced skills is clearly congruent with the famous saying by Confucius, “I hear, I forget; I see, I remember; I do, I understand,” (Brainy Quote, 2001 and Carravilla and Oliveira, 2004). Further, the value of simulation training increases when the skills under training have a direct relationship to patient outcomes. Simulation training for invasive procedures offers an opportunity to perform a procedure in a simulated environment with the feedback from the instructor. Additionally, the

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opportunities for practicing the procedural skills on a mannequin to promote the understanding can be valuable as compared to performing the same procedure on an actual patient without the aforementioned opportunities. Simulation programs offer many advantages which include: Improvement in knowledge and skills, an opportunity to practice in anon threatening environment and make mistakes during simulation as well as an opportunity to be corrected before the mistakes can hurt an actual patient. In addition to the ability of Simulation Based Training (SBT) to minimize the room for error, it has also been supported as a method of teaching critical thinking, which can serve as an asset in an actual patient care environment. This is probably why the support for simulation as a part of clinical training was also offered by Institute of Medicine National Research Council (2010).

2. Background and Significance

The use of simulation in healthcare education is timely and addresses the need to improve patient safety and quality of care. As the emphasis on these areas increases, it is necessary to provide the opportunities for the students to practice required skills first in a simulated and safe environment. Providing student NPs with the necessary skills to perform invasive procedures such as CVC placement coupled with an assessment of their ability to independently perform the procedures, is a valuable tool in caring for the acutely deteriorating Intensive Care Unit (ICU) patients. Upon graduation from the program, the ACNPs competent in the invasive procedural skills will add much strength to the patient safety and quality of care initiatives.

The need for competency based education and training has been recognized for medicine residency programs as well. Weinberger et al. (2010) and Johnson et al. (2013), also acknowledged the need for contemporary Pre Service Education (PSE) for the health occupations and professions focuses on the acquisition of competencies that are needed immediately upon entry into the workforce. This would provide the knowledge, the skills, the attitudes and the behaviors necessary for a safe and effective practice. The need for preparing ACNPs to enter into clinical practice with a minimum level of proficiency to practice procedural skills is in line with the need for the competencies for the medicine residency graduates as both would be employed in the roles of practitioners who are charged with management of acutely ill patients. Having the minimum level of proficiency will provide the entry level ACNPs the ability to perform the procedures safely owing to the quality of care. Using simulation to facilitate the ability of the practitioner in training to learn the safe practices and have the opportunity to make errors in the simulation lab appears to be a step in the direction of safety. After the initial simulation training, these practitioners in training should be able to practice this skill under the supervision of the preceptor during their training programs. This will allow for a minimum level of proficiency prior to entering the job market.

Importance of simulation based training for safe patient care was also emphasized by Federico et al. (2013), "One in every one hundred and fifty patients admitted to the hospital dies as a consequence of an adverse event" (p.1). Even though the paper was focused on the importance of Simulation Based Training for anesthesia and operative procedures, they are clearly applicable to the skills and knowledge required for performing invasive procedures in critical care as well.

In a recent paper Rienarz (2013) articulated the significance of SBT who studied the impact of simulation-based training. The author found that the simulation training increased self-efficacy and procedural competency for all participants. This study was conducted as a practice improvement project to teach the Neonatal Nurse Practitioners (NNPs), the thoracostomy skills in tension pneumothorax neonates (Rienarz, 2013).

Ruesseler et al. (2010) studied the impact of SBT on group of 44 medical students (n = 44). The study was conducted in Frankfurt, Germany, where the group of students were sub divided into two sections; control and intervention group. The intervention group was given simulation based training on basic life support (BLS), advanced cardiac life support (ACLS) and advanced trauma life support (ATLS) over a three-day simulation-training program. The control group attended three emergency department shifts in a shadowing role. The authors found that the intervention group scored significantly higher than the control group on an objective structured clinical examination with a checklist rating. The intervention group scored 90% in the BLS compared to 62% in the control group. Scores of the intervention group were higher in the ATLS training group as well; 76% compared with 52% in the control group. The authors concluded that the standardized SBT curriculum was superior to the clinical practicum with shadowing opportunities (Ruesseler et al., 2010).

Bruppacher et al. (2010); also conducted a study to test simulation as a teaching methodology to improve performance in real patient situations. The authors compared the ability of medical students to perform weaning from cardiopulmonary bypass of students who attended SBT compared to the students who attended traditional interactive seminars alone. The average post-test scores of the students who underwent simulation training were 89.9% compared to 75.4% in the traditional interactive seminar group. This study also evaluated the ability of the students to retain the learned skills in the SBT and the seminar groups. Retention test administered five weeks after the initial testing showed that the SBT group's average scores further improved to 93.2% compared with the seminar group scores that were 77% on an average (Bruppacher et al., 2010).

Simulation as a training method involving expensive equipment and resources is a novel method of teaching and needs further in-depth research however initial data appears promising. Having said that there are concerns regarding the affordability and costs of such programs in tough economic times. Perhaps, an understanding of the cost savings element can be further explored in terms of the patient safety (Vermeulen et al., 2016).

3. Theoretical Framework

Stages of skill acquisition as explained by Barraclough (2014) apply to the concept of proficiency development as a theoretical basis for the program of simulation for teaching invasive procedural skills and the knowledge. The following three sequential stages of skill acquisition were utilized and applied to the simulation program for teaching procedural skills to ACNPs; the Cognitive, the Associative and the Autonomous stages.

3.1. Cognitive Stage

During this first stage of skill acquisition, the learner develops an understanding of skills to be learned. Applied to the CVC and AC insertion skills, the learner was provided the background knowledge and understanding of the procedures, followed by the faculty led demonstration. This provided visual exposure to the ultrasound guided CVC insertion in the simulation lab via demonstration by the instructor (Barraclough, 2014).

3.2. Associative Stage

The second stage of skill acquisition, known as the Associative stage; where the learner is offered an opportunity to practice the skill and learn how to do it. Applying to the simulation program for procedural skills, the learner was given an opportunity to actually perform the procedure on a mannequin in the simulation lab under supervision. This allowed for errors to be made in the lab with corrective actions taken without any harm to the real patients. Simulation lab was also utilized for testing of these student's skills and completion of a competency checklist (Barraclough, 2014).