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Procedural Sedation Training: Competency Verification Through Simulation

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Executive Summary

Introduction

Safe and effective management of patients undergoing procedural sedation outside of the

operating room setting is a joint responsibility between the provider and a registered nurse (RN). Nurse

professional development (NPD) practitioners must be able to validate competency of RNs who will be

monitoring patients undergoing procedural sedation to ensure safe practice within their institutions.

Ultimately, procedural sedation competency validation impacts the safety and quality of care that

nurses provide (Salmela & LaValley, 2021). However, a standard method for competency validation does

not exist across all organizations, with inconsistent use of online modules, classroom lectures, and

knowledge-based testing (Werthman et al., 2021). Establishing a standard of competency validation

based on simulation with pre-learning would allow NPD practitioners to ensure that RNs monitoring

procedural sedation are competent to provide safe and effective care. The overall success of the

competency validation would be evidenced by RN-reported comfort with the skill and improved patient

outcomes (Auerbach et al., 2016; Clark & Collins-Yoder, 2020; Friedman et al., 2018).

Literature Review

The literature review aimed to investigate the current evidence related to competency

verification, through simulation, in a procedural sedation training course. A literature search was

performed in January and February of 2023 using CINAHL. Search terms and phrases included *simulation*

training or simulation education or simulation learning, sedation, procedural sedation or sedative or

sedate, safety or danger or risks or complication, nursing, training or education or development or

learning, competency validation, and simulation. The inclusion criteria were articles published between

2018 and 2023, in English, and in academic journals. The first search of *simulation training or simulation*

education or simulation learning AND sedation resulted in 13 articles, two of which were relevant. The

search of *procedural sedation or sedative or sedate AND safety or danger or risks or complication AND nursing* returned 82 articles, three of which were relevant. The search of *procedural sedation AND training or education or development or learning AND nursing* resulted in six articles, one of which was relevant. The last search of *competency validation AND nursing AND simulation* resulted in 61 articles, 15 of which were relevant. An additional search in ERIC using the same criteria yielded no relevant results.

The literature review revealed that simulation has been shown to be an effective tool for teaching, learning, and competency validation within the academic and hospital spheres (Billings & Halstead, 2020; Clark & Collins-Yoder, 2020; Covington et al., 2019; Franklin et al., 2020; McBride et al., 2021; Montgomery et al., 2021; Oermann & Gaberson, 2021). There is a vast body of knowledge that supports the use of simulation for a variety of health professions, and experts tout its effectiveness. Simulation has been used consistently within nursing programs in multiple forms from task trainers that allow students to practice skills to Objective Structured Clinical Examination (OSCE) that provides a method of summative evaluation. In addition, simulation has been used within the hospital setting to allow nurses to practice skills and demonstrate competency, such as with life support training (Lopes Oliveira & Bernardino da Silva, 2018).

When used for teaching and learning, simulation provides a bridge between conceptual knowledge and its application at the bedside by allowing learners a safe place to practice this application and a variety of skills without consequence to patients. By providing this psychological safety, learners are better able to take risks that can lead to improvement in their self-confidence and advancement in their knowledge acquisition. When used as an evaluation tool or to evaluate competence, simulation can allow educators to observe the real-time and real-to-life application of knowledge and skills in a way that other evaluations cannot (Arrogante et al., 2021; Montgomery et al., 2021).

Learners find simulation to be a highly satisfying way to learn and, in some studies, learners even recommend the application of simulation throughout their entire program (Arrogante et al., 2021; Friedman et al., 2018). Through simulation, learners demonstrate improved knowledge retention and report increased instructor effectiveness compared to other forms of instruction (Covington et al., 2019; Guerrero et al., 2022; Friedman et al., 2018; Taha et al., 2021). Learners who participate in simulation also show increased self-confidence and self-efficacy, which translates to improved patient outcomes (Auerbach et al., 2016; Covington et al., 2019; Friedman et al., 2018; Guerrero et al., 2022; Hickey et al., 2021; Montgomery et al., 2021). Improvement seen in learners has been linked directly to the improvement of a variety of patient safety and quality outcomes (Auerbach et al., 2016).

Simulation with prelearning is an effective means of instruction and competency validation because it improves learner confidence, satisfaction, self-efficacy, knowledge acquisition, and retention, and it also impacts patient outcomes. A sound body of knowledge supports the use of simulation as a teaching methodology and a way to validate competency. Simulation has been used effectively for this purpose in life support classes and various other settings. By using simulation with prelearning as the basis for standardizing the competency validation, the expectation is that RN documentation, learner-perceived confidence and self-efficacy, and patient outcomes will improve.

Project Methods

The purpose of this quality improvement project was to address the need for a standardized procedural sedation competency validation method that would demonstrate improved RN documentation, learner-perceived confidence, and patient outcomes. This project focused on the implementation of a Procedural Sedation Training Course, comprising an in-person prelearning lecture, a group simulation learning experience, and an individual verification simulation, during which a rubric was used to evaluate the competency of each individual learner. Learners were deemed competent if they scored satisfactorily, based on the rubric. If learners did not score satisfactorily, remediation was

provided until the learner could demonstrate competence. Once the learners demonstrated competence, they completed the National League for Nursing Self-Confidence for Learning in Simulation and the Simulation Learning Effectiveness Inventory (Chen et al., 2015; National League of Nursing, 2005).

The Procedural Sedation Training Course was implemented in a 450-bed tertiary care hospital serving Central Illinois and included all newly hired nurses and transfers entering care areas that perform procedural sedation between June 1, 2023 and January 31, 2024. The project was a quality improvement project and was submitted to the Institutional Review Board at Southern Illinois University Edwardsville and was approved.

Evaluation

Seventy-two learners attended the Procedural Sedation Training Program during the pilot period. These learners were RNs who were either new employees or transfers to one of the 17 procedural, intensive care, and emergency departments. At the end of the pilot, 56 of the 72 learners had completed verification of competency through simulation and all 56 learners completed the surveys at the completion of the course. Twenty-four of the 56 registered nurses had record of completing a procedural sedation at the time of data collection for documentation compliance and safety event reports.

The results of the National League of Nursing Self-Confidence for Learning in Simulation questions one through 12, established at least 89% of learners selected either agree or strongly agree. However, for question 13, "It is the instructor's responsibility to tell me what I need to learn from the simulation activity content during class time," only 74% of learners selected agree or strongly agree. The results of the Simulation Learning Effectiveness Inventory showed for each of the 32 questions, at least 86% of learners chose agree or strongly agree.

In review of the procedural sedation documentation compliance, the project lead used existing reports to review data for nursing-sensitive indicators. Compliance with these nursing-sensitive indicators for all team members within the organization performing procedural sedation documentation was 87.42% for Aldrete Score, 87.70% for End Tidal Carbon Dioxide monitoring (ETCO2), and 84.66% for Ramsay score. Compliance for participants who completed the procedural sedation training was 86.75% for Aldrete Score, 87.74% for ETCO2, and 84.18% for Ramsay score.

Safety reports spanning the 8-month pilot period were pulled from the organization's reporting system, and 74 safety event reports mentioning sedation or related key words were pulled. Of the 74, 45 were specifically related to procedural sedation. It is not possible to determine if these events involved participants in the simulation training course, but in all 45 of the events, the registered nurse and team responded appropriately to sedation-related complications.

Learners indicated satisfaction and self-confidence with simulation as a learning experience. The high percentage of learners indicating they agreed or strongly agreed on all items in the National League of Nursing Self-Confidence for Learning in Simulation related to self-confidence and satisfaction demonstrates that the simulation was a useful learning tool. The high percentage of learners indicating they agreed or strongly agreed on the 32 questions of the Simulation Learning Effectiveness Inventory demonstrates the learners' belief that the simulation was effective in meeting the learning objectives.

The documentation compliance rates over the pilot period show no difference between team members who attended the Procedural Sedation Training Course and all team members working in procedural areas within the organization. This demonstrates that the class and simulation were as effective as traditional education and competency verification methods used within the institution in ensuring appropriate documentation.

One limitation of this project was the removal of the pre-test from the process. The project leader discovered that the pre-test was time consuming, confusing to learners, and consistently

demonstrated a lack of existing knowledge of the course materials. In order to improve the learner experience and maximize the time for other elements of the course, the pre-test was removed. In addition, department educators from the intensive care unit and emergency department requested that learners return six weeks after lecture completion to demonstrate competency, allowing them the opportunity to practice the skills under the supervision of a preceptor on the unit. However, after three months of this process, learners demonstrated a loss of knowledge gained during the lecture, and none of the learners reported the opportunity to practice procedural sedation with a preceptor. It was determined that this practice was not beneficial, and the practice of having the learner return at a later date to complete simulation was discontinued.

Practice Impact

This project demonstrated that simulation with prelearning is an effective means for verifying competency for registered nurses in this inpatient setting. Simulation can be an effective tool for allowing registered nurses to practice skills in a safe environment, especially when skills are high risk or low volume. In addition, department leaders, educators, and preceptors struggle to verify competency in new nurses when opportunities are limited. This project has allowed the pilot organization to move forward with using simulation as a tool for competency verification for procedural sedation in the future. This has standardized the organization's process as well as increased the opportunity for RNs to be deemed competent, which has alleviated staffing constraints. In addition, the pilot hospital is moving to a new competency module in 2025 and will be using simulation as an option for verifying competency for select skills.

Conclusion

A standard method for competency validation of procedural sedation care does not exist across all organizations, with inconsistent use of online modules, classroom lectures, and knowledge-based testing. Competency validation is necessary to nursing practice and safe patient care. Simulation has

consistently been shown to be an effective means of evaluating competency in nursing students and across a variety of academic settings. The Procedural Sedation Training Course was effective in assisting learners to meet learning objectives and was effectively used to validate competency in registered nurses at the pilot organization. When simulation was used to validate competency, learners maintained documentation compliance at the same level as those who demonstrated competency in a variety of other ways across the organization. In addition, learners reported high levels of satisfaction, self-confidence, and effectiveness. There were no untoward patient outcomes in the time period of the study, which indicates that learners who verified competency through simulation were able to practice safely in the patient care setting. The initial results of the project have shifted the organization's method for competency verification permanently and opened the door to the possibility of verifying competency of other skills using simulation. Further research is needed to determine the effectiveness of simulation as a competency verification tool for other skills within the patient care setting.

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