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Development of Neuraxial Anesthesia Educational Videos for Nurse Anesthesia Students

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Executive Summary

Introduction of the Problem

Student registered nurse anesthetists (SRNAs) encounter many challenges learning clinical skills, including neuraxial anesthesia, while in the didactic setting. SRNAs are required to learn and perform an extensive list of clinical competencies as part of their professional training and education to ensure a smooth transition into the clinical setting. Students often search online platforms to supplement traditional teaching methods, but with the unregulated content available across many online sources, students may come across inaccurate, misleading, or biased information (Clifton & Mann, 2011). Nurse anesthesia programs need appropriate resources to facilitate the delivery of concepts to students of all learning styles. This project aimed to create and implement neuraxial anesthesia instructional videos for an introductory course in a nurse anesthesia program.

Literature Review

The majority of students learn most effectively with multi-modal learning models that incorporate more than one learning style into the curriculum (J.P & Ranadev, 2018; Fleming & Mills, 1992). In addition to traditional teaching methods, video learning is an efficient way to incorporate technology into course curriculums. Videos are valued by students and have been shown to be equal to, or superior to, these aforementioned traditional teaching methods (Fong et al., 2019). In the healthcare setting, implementation of educational videos significantly improved adherence to protocol during a complex medical procedure creating improved provider competency (Kandler et al., 2016; Kelly et al., 2009).

Special emphasis was placed on developing additional course materials including protocols and rubrics that mimicked the information provided in the videos. Practice protocols

aim to teach, provide direction and guidance, standardize procedures, increase consistency and efficiency, and avoid conflict or misunderstanding (MacLachlan et al., 2012). Rubrics, used for grading student performance of clinical skills, set clear expectations for students and should be easy to follow (Massachusetts General Hospital Institute of Health Professions, 2021).

Neuraxial anesthesia has been an important part of anesthesia practice since the turn of the 20th century (New York School of Regional Anesthesia [NYSORA], 2018). Neuraxial anesthesia includes spinal (intrathecal), epidural, combined spinal-epidural, or dural puncture epidural techniques (Pellegrini, 2017). The use of neuraxial anesthesia, rather than general anesthesia, is associated with a reduction in risk for a range of adverse perioperative outcomes and therefore is used in a wide variety of surgical procedures (Weinstein et al., 2018). This literature review focused on spinals and epidurals. Among the most valuable information included in the literature review includes neuraxial anesthesia indications and contraindications, monitoring and equipment, procedure technique, sterile technique, dosing, and adjuvant agents.

Project Methods

After a thorough review of the literature, updates to the neuraxial anesthesia practice protocols were made following current evidence-based practices. Educational videos demonstrating neuraxial anesthetic techniques were then created. These videos were provided to 1st year nurse anesthesia students with the goal of improving their knowledge on neuraxial anesthesia. Additionally, the literature review was used to guide updates to the program's existing rubrics to provide students with the most accurate and up-to-date information available. Professional videography was utilized to ensure the videos were of high quality. The educational videos and test-out rubrics closely align so that students can clearly understand expectations. The existing rubrics, last updated several years ago, did not vary significantly from current evidence-

based recommendations for neuraxial anesthesia; therefore, most changes in the rubrics were made to present the information in a more clear and concise manner.

This quality improvement project (#1571) was determined to be Non-Human Subjects Research by the Southern Illinois University Edwardsville Institutional Review Board effective 3/28/22.

Evaluation

Educational Assessment

Participants in this quality improvement project included 32 students. Upon analysis of the pre-test, it was determined that the low score was 4 out of 10, the high score was 10 out of 10, and the overall mean score was 7.97 out of 10. Upon analysis of the post-test, it was determined that the low score was 7 out of 10, the high score was 10 out of 10, and the overall mean score was 9.28 out of 10. There was a 16.44 percent increase in the mean score from the pre-test to the post-test. The questions showing the greatest increase in scores were questions 6, 9, and 10. The topic assessed in these questions was epidural technique. This increase in scores suggests a gain of knowledge after utilization of the educational videos and is further described in Figure 1.

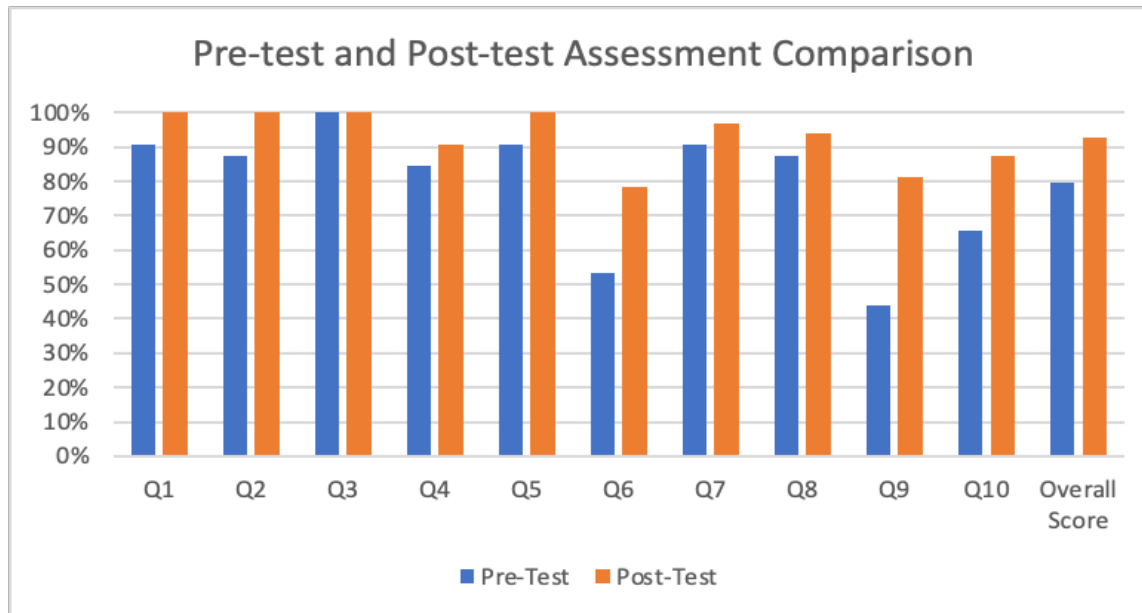


Figure 1. Depiction of results of knowledge-based questions.

Survey Responses

Likert-style Items. Qualitative data from the 5-point Likert-style questions showed the following: Most students (93.8%) agreed or strongly agreed (mean= 4.8) that the supplemental videos were easy to access and 96.9% agreed or strongly agreed (mean=4.9) that the videos were easy to understand. When asked if the videos aided in their understanding of neuraxial anesthesia and their performance of neuraxial anesthesia, 96.9% of students agreed or strongly agreed (mean= 4.9). All students surveyed (100%) declared that they would prefer the incorporation of video learning for future topics covered in class (mean= 4.9). The skills rubrics were reported to be easy to understand by 96.9% of students (mean= 4.8). It was communicated by 96.9% of students (mean= 4.9) that the information taught in the videos aligned with the information listed on the skills rubrics. Additionally, having peers teach in class was reported by 96.9% of students (mean= 4.9) to have aided in their educational experience.

Open-ended Items. Students were asked to identify what educational tool or learning activity was most impactful on their understanding of neuraxial anesthesia. Themes gathered

included small group hands-on learning, supplemental videos, and real time guidance from peers. Additionally, students were asked what suggestions they have for improvement of this educational module. Themes gathered include providing videos for all skill checkoffs and having more peers/instructors available during lab sessions.

Limitations of this project include small sample size, as only 32 students participated in this project. Additionally, half the class had their lab session immediately following the classroom lecture while the other half had their lab session a week later allowing access to the videos for an extra week before taking the post-test.

Impact on Practice

Following implementation of this quality improvement project, students showed improved knowledge over neuraxial anesthesia and reported increased satisfaction of the learning module. These results demonstrate successful implementation of video learning in the nurse anesthesia curriculum and suggest that video learning should be utilized to supplement current teaching practices in all courses with a clinical skills component. Students moving forward are predicted to possess stronger neuraxial anesthesia confidence and skills as they enter the clinical setting. This should create a safer environment for patients receiving care from future nurse anesthesia providers.

Conclusions

This quality improvement project implementation was successful in improving student knowledge of neuraxial anesthesia. In addition, it allowed for an improved multimodal approach to the education module.

Nurse anesthesia education modules introducing bier blocks, central lines, and anesthesia machine checkout in the Introduction to Nurse Anesthesia course should consider incorporating a

video learning component to the current curriculum. In addition to the nurse anesthesia program, other nursing programs including the family nurse practitioner program and the undergraduate nursing program can take from this quality improvement project to implement video learning to their curriculum to supplement current teaching methods.

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