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Screening for Prone Positioning Knowledge as a Treatment in Undergraduate Nursing Students

Michelle Barton

Senior Honors Project Write-Up
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Jennifer Kepler and I are the two nursing students that entered the 2022 Honors Cohort during the summer of 2018. We have worked together closely for the past four years and jumped at the opportunity to continue challenging ourselves with research. We decided on investigating something related to our combined interest in becoming care providers in the intensive care setting. The COVID-19 pandemic has highlighted the need for, and care given within the intensive care units (ICUs). Prone position is a new form of complementary treatment for acute respiratory diseases such as COVID-19. Many patients are dying from a COVID-19 complication called acute respiratory distress syndrome (ARDS) which is defined as a life-threatening lung injury in which fluid enters the alveoli of the lungs, inactivating surfactant and resulting in alveolar collapse and impaired gas exchange and tissue perfusion. To combat the alveolar collapse, providers may have patients turn into the prone position or the body position in which person lies flat with chest (ventral side) down and back (dorsal side) up. This aids in oxygenation because it allows for gravity to pull the body organs away from the lungs, allowing them to fully inflate and match ventilation with perfusion.

With this knowledge about prone positioning, we knew what to do and how to implement this practice change. However, there was a knowledge deficit within the greater University of Portland School of Nursing (UPSON) student body. Our project was aimed to screen for undergraduate, upper division nursing students' awareness of prone position as a treatment. Additionally, we analyzed student perceptions of this treatment. To guide our study, we developed the PICOT question: In patients with ARDS as a result of respiratory infections, how

does increased duration of prone positioning in treatment compared to brief or no prone positioning affect mortality? This led us to complete a literature search for information to provide as supplemental education to our peers.

After finding ten sources that discuss our topic of prone position and its effects on patient mortality, we documented our research through the construction of an evidence synthesis summary. Our findings led us to conclude that prone positioning increases oxygenation and improves mortality, is ventilation compatible, and has no added risk. Some caveats of these conclusions are that prone positioning must be implemented early, for a duration of at least sixteen hours, and in severely hypoxemic patients. It is compatible and beneficial with all types of ventilation including from room air, nasal canula, and intubated on positive and negative pressure ventilators. Finally, prone positioning does not increase any risks as everything that is risky for this maneuver is already at risk in these patients. For example, the patient could develop pressure ulcers, but their sedentary, supine position will put them at risk already, just on different places of their body (ie. bottom vs chest/collar bone).

With this new understanding and evidence-based information on prone positioning, we created a supplemental education presentation for our peers to be given at the University of Portland Student Nurses Association Meeting in February and at all nine sections of NRS 326: Pathophysiology and Pharmacology. Before providing additional information on prone positioning, we administered a three-question anonymous, voluntary Qualtrics survey. This pre-survey illustrated baseline knowledge about prone positioning as a treatment and student comfort with these ideas. The survey asked the participants to respond to these three statements on a Likert-scale (from strongly disagree to strongly agree): I am confident in my current ability to provide competent nursing care to ARDS patients; I am aware of the best practice for ARDS

patients; I am comfortable implementing prone positioning in ARDS patients. We allowed the participants to complete the pre-survey, then jumped into our presentation on the conclusions of our literature review. After our presentation, we had the participants complete a post-survey through Qualtrics that included the same three questions as before. To analyze the differences between each participant's understanding before and after the supplemental education, we had each participate create a unique, three-letter identification code during the first survey and use it to log into the second survey. Data analysis included a paired, pre/post T-test to determine the aggregate differences between initial student responses and student responses after supplemental education. A thematic analysis was also used to analyze students' perceptions and understanding.

Overall, the participants responded to the pre-survey stating that they were not confident, unaware, and uncomfortable with the ideas and practices related to prone positioning as a treatment. However, after the supplemental presentation, the participants became more confident, aware, and comfortable with these ideas. Statistically, these differences were significant as the p-value calculated through the T-test were less than 0.05 for each of the questions.

With this information gathered from the literature review and student surveys, we recommend a practice change, or a continuation of a practice change, to further increase the use of prone positioning as a complementary treatment for ARDS patients and extrapolate out to additional COVID-19 patients. We recommend further dissemination of this information and research to undergraduate nursing students, specifically upper division students, as they will quickly be entering the workforce and will likely care for patients with acute respiratory symptoms. Education increases new graduate confidence and clinical expertise allowing them to feel more prepared. Finally, we recommend further research into the use of prone positioning as a treatment and the use of simulated clinical experiences as a learning model for care providers.

Simulation is already used in nursing school for other hands-on skills, and we believe it would be beneficial to expand this practice out to include higher risk skills such as prone-ing. The implementation of prone positioning is also completed in a team setting, meaning multiple caregivers will be working together to turn the patient. This will require communication and practice to be implemented safely. Simulation can be appropriate setting for this practice. Since we do not know how "Long COVID" will present itself or what the pandemic will bring next, it is best practice to educate our undergraduate nurses with the most recent information and practice changes before they enter the field to smooth their transition into practice.

Our effort to disseminate this research to others including active nurses and student nurses included presentations at two local conferences. We presented at the Western Institute of Nursing (WIN) 2022 Conference and the 2022 University of Portland Founders' Day. As for the presentation at WIN, it was during a poster review session, and I stood by the poster answering questions that the fellow participants asked during the session. Jen and I presented together at Founders' Day with a podium presentation in the second session. This presentation was focused on our nursing peers and faculty at the University of Portland. Overall, the information presented was well received and people were interested in where the next phase of research will lead.

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