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Competence, confidence and knowledge retention in undergraduate nursing students — A mixed method study

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ABSTRACT

A primary goal of nursing programs is to ensure that graduates can successfully enter into professional practice. This paper examines the relationship between competence, confidence, and knowledge retention in undergraduate nursing students.

The study involved a three test quantitative component as well as a qualitative component. The quantitative component comprised a pretest, posttest immediately following the intervention, posttest three month design. The intervention was comprised of an intensive one day advanced cardiac skills knowledge and simulation activity. The three tests measured competence, confidence, and knowledge retention.

The results of the study demonstrated the intervention was effective in improving perceptions of competence and confidence both immediately and at a three month timeframe. Knowledge retention also was statistically significant at a three month timeframe.

This study demonstrates the value of advanced knowledge and skill for undergraduate nursing students. Despite the policy enforced reality that participants were not able to use the knowledge and skill in clinical practice, the motivational benefit of the advanced knowledge had significant positive effects on participants.

A primary goal of all nursing programs, in any country, is to ensure that graduates can successfully master knowledge, skills and attitudes sufficient to successfully enter professional practice. Typically, both education institutions, as well as nursing associations, utilize the construct of competence to describe the particular knowledge, skills, and attitudes required before entry to practice (Fernandez et al., 2012), but the process of ensuring that competence is achieved is both problematic and challenging. Despite significant resources and efforts invested by nursing programs worldwide, graduates still struggle with entry-level competencies (Cohen et al., 2013; De Witt Jansen et al., 2013). This paper outlines the results of a pilot project that challenges the traditional mastery theoretical approach (Sharma et al., 2017) to competence development by measuring the effectiveness of a highly advanced knowledge and skill intervention on the development of competence, confidence and knowledge retention in undergraduate nursing students. The unique design of this study was that the knowledge/skill intervention was so advanced that students did not get the chance to actively practice the skill in clinical settings. This study sought to understand the unique psychological and experiential benefits of a novel and advanced knowledge and skill set on general competence, confidence and knowledge retention.

1. Literature Review

1.1. Gaining Competence Through Mastery Learning

The idea of a gradually advancing the complexity and difficulty of knowledge and skills is a pedagogical concept and approach that has been extensively utilized within nursing education (Gonzalez and Kardong-Edgren, 2017; Roh et al., 2016). This approach is identified as 'mastery learning' and reflects the generalized theoretical idea of competence (Inui, 2015; Sharma et al., 2017). Mastery learning is an educational approach, originating within primary education in the 1980s and 90s, in which students are required to 'master' certain levels of competence before moving on to greater levels of complexity (Slavin and Johns Hopkins Univ, 1987). This pedagogical approach has been particularly pervasive in the nursing context of clinical simulation and clinical teaching (Cohen et al., 2013; Roh et al., 2016). There are problems, however, with how the pedagogical concept of mastery learning translates into the pragmatic concepts of clinical competence, confidence, and knowledge retention. These concepts and problems will be explored.

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1.2. Competence

Within nursing, competence generally refers to possessing the knowledge, skills and attitudes that enable the provision of quality care, demonstrate appropriate behaviours, and make sound clinical judgments (Bartolone, 2008; Pijl-Zieber et al., 2014). Where the term gets problematic is in the details of how to create and measure competence (Khan and Ramachandran, 2012). Creating competent practitioners is the goal of any professional practice program, but the literature strongly argues that competence is more than just a 'tick list' of skills (Garside and Nhemachena, 2013; Jolly, 2012). This reality makes the measurable end goal of competence, or mastery, difficult to objectively measure.

Within nursing education, a level of effectiveness in creating and measuring practice competence has been achieved (Cohen et al., 2016; Khan and Ramachandran, 2012), but despite these efforts, the definitions of competence, the desired level of competence by stakeholders, as well as student/graduate satisfaction with competence, remains elusive (Fernandez et al., 2012; Pijl-Zieber et al., 2014). This study takes a different view on competence development, and adopts the stance that factors of motivation, the promotion of confidence, and the acknowledgement of the value of knowledge retention are just as important as more traditional, mastery driven, factors of competence development. These factors will be explored.

1.3. Confidence

There is been a growing investigation of the role of personal and interpersonal confidence in the development of competence in nursing students. In the professional context under discussion, confidence is defined as the ability to take knowledge and skill and move it into action and behaviour (Center and Adams, 2013). Confidence is valued, both in its role in developing competence (Fong, 2013), as well as a terminal measure of demonstrating competence (Cohen et al., 2013). A direct correlation between confidence and competence has always been problematic, however (Olsson, 2014). This reality is compounded by the fact that students frequently report both a lack of confidence and competence despite positive objective measurements of clinical competence (Dehmer et al., 2013). This reality raises the question whether competence or confidence is more important as a predictor for future success and knowledge retention such (Center and Adams, 2013; Roberts and Johnson, 2009). Despite some evidence from the literature that a relationship exists between these two concepts, the relationship remains vague (Blum et al., 2010). This study will attempt to provide evidence for the importance of confidence.

1.4. Knowledge Retention

Not a lot has been written about knowledge retention within the nursing literature. There exists an unwritten assumption that our learning strategies will automatically result in knowledge retention and ultimately competence. Liaw et al. (2012) question this assumption, however. These authors, who found clinical simulation to be an effective tool in knowledge retention, suggest that knowledge retention needs to be designed into an activity rather than assumed. Other authors discuss knowledge retention (Boet et al., 2017; Kirkman, 2013), but the evidence base for successful knowledge retention is weak and tends to be based on qualitative assumptions rather than more rigorous designs. This study will make the case that knowledge retention can be designed into activities, and can be measured.

1.5. Summary

To sum up, the question remains on the relationship between competence, confidence, and knowledge retention. This study examines the effect of a significantly advanced knowledge and skill intervention on competence, confidence and knowledge retention.

2. Method

A mixed quantitative and qualitative approach was utilized for this study. The intervention was a concentrated one day seminar similar in content to the American Heart Association — Advanced Cardiac Life Support (ACLS) program (Field et al., 2010). There was a three hour knowledge session followed by a three hour high-definition simulation activity.

The quantitative component consisted of two psychometric tools as well as a knowledge test on advanced cardiac knowledge. Confidence was measured using the *Nursing Anxiety and Self-confidence with Clinical Decision-making Tool*. This tool has proven reliability and a Cronbach alpha score of $\alpha = 0.98$ (White, 2014). Competence was measured using the *Nursing Student Competence Scale*. This tool also has proven reliability and a Cronbach alpha score of $\alpha = 0.89$ (Watson et al., 2002). In addition, an advanced cardiac knowledge test was constructed by the authors, based on the American Heart Association guidelines (Field et al., 2010), to test knowledge retention. These three tests were administered immediately before the one day seminar as a pretest, immediately after the one day seminar as post-test 1, and after a three month interval as post-test three months.

The qualitative component was comprised of one-on-one interviews with each participant in the project. Interviews were completed in the two weeks following the one day seminar as well as at the post-test three month timeframe. An inductive thematic analysis was chosen to support and be an adjunct to the quantitative findings. The approach used the general principles of inductive reasoning, constant comparison, and thematic interpretation (Braun and Clarke, 2006).This study sought to understand how confidence and competence evolve and to provide quantitative evidence of the same.

2.1. Demographics

24 participants were involved in the research study. All participants were in the third or fourth year of a Canadian undergraduate nursing program. Participants' ages ranged from 22 to 29 years of age. The gender ratio of 5 males and 19 female participants was somewhat higher than typical demographics of nursing programs in Canada. Most participants were in their community health rotation at the time of the intervention and interviews.

2.2. Data Collection

This study was carried out in accordance with the Canadian tri-Council statement on research ethics involving humans. This statement aligns with the code of ethics of the World Medical Association for experiments involving humans. Ethical approval was obtained from the institution where sampling occurred.

Students were alerted to the study through posters at the one participating institution and recruited through e-mail communication, and a short presentation in their practicum orientation. Out of a possible pool of 180 students eligible to participate, 24 participants responded and fulfilled all the requirements for inclusion. All participants signed a consent form to be part of a study after all risks and benefits had been discussed. All quantitative tests were identified only by a number. Pseudonyms were generated immediately following the interviews and used through the analysis.

The intervention consisted of a three-hour knowledge presentation by a critical care RN. The content was based on the American Heart Association guidelines (Field et al., 2010) and included cardiac pathophysiology, ECG lead placement and interpretation, respiratory interventions, reversible causes (H & T's), and resuscitation medications. The knowledge presentation was followed by a three-hour practical skills session using high fidelity clinical simulation.