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Nursing Students' Perceptions of Learning Psychomotor Skills: A Literature Review[1,2]

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ABSTRACT

The aim of this qualitative literature review was to answer the question, "What are nursing students' perceptions of learning psychomotor skills?" After reviewing 96 studies from 1980 to June 2016, 6 studies met inclusion criteria. Six themes were identified: peers are important; practice on real people; faculty members matter; environment is essential; patients need my skills; and anxiety is ever present. Faculty members can use these findings to better understand students' experiences when learning psychomotor skills.

The best educational methods to teach nursing students how to competently perform psychomotor skills remain elusive. Psychomotor skills, such as vital signs, medication administration, patient hygiene, and intravenous therapy, are taught in most every nursing program (Boxer & Kluge, 2000). These skills represent the foundation of nursing care, yet there has been little research within the last 10 years examining psychomotor learning in nursing and students' experiences with psychomotor skill acquisition (Oermann, Muckler, & Morgan, 2016). The use of emerging technologies, such as simulation and gaming, and the concept of deliberate practice with skills learning makes best teaching practices quite relevant today. As a result, this article will review and synthesize the current qualitative literature about nursing students' perceptions of learning psychomotor skills and identify areas for further research.

Background

Nursing students perceive a direct link between learning psychomotor skills and learning how to become a nurse and believe that being able to perform psychomotor skills successfully is critical to becoming a competent nurse (Bendz, Widang, Johansson, & Paulsson, 2004; Ellison, 2000; Wright & Wray, 2012). Nursing faculty members spend significant time in the nursing curriculum teaching psychomotor skills and, for many years, have shared examples of creative ways to teach skills (Love, McAdams, Patton, Rankin, & Roberts, 1989; McNett, 2012; Snyder, Fitzloff, Fielder, & Lambke, 2000) and when to teach skills (DeBourgh, 2011). However, there is no single accepted method about how to best teach psychomotor skills in nursing.

There are many barriers to nursing students learning psychomotor skills. From a curriculum standpoint, Bjork (1997) traces the change in settings where nurses have been educated over time. When nurses were primarily educated in the hospital setting, psychomotor skills were taught at the bedside during numerous clinical hours of training. As nursing education moved into the college and university setting over time, fewer clinical hours led to skills being primarily taught in the skills laboratory and reinforced at the bedside (Bjork, 1997). In addition, the changing clinical environment provides students fewer opportunities to perform skills during their clinical time. There are numerous reasons for this change, including increased patient acuity, nursing shortages, higher numbers of students present in the hospital, and increased liability concerns from hospitals (Ross, 2012).

Students also tend to retain basic nursing skills poorly even prior to graduation. For example, one study of nursing students found that after initial cardiopulmonary resuscitation (CPR) training, none of the students could successfully perform CPR 22 weeks later; however, all of the students were able to use the automated external defibrillator (Kardong-Edgren & Adamson, 2009). A small pilot study examined student performance of urinary catheterization (Gonzalez & Sole,

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2014). This study found that despite demonstrated competence from a skills test, 77% of the students breached aseptic technique during a random performance of the procedure. The authors concluded that educators cannot validate a skill one time and hope that the students will retain it; rather, skills must be practiced regularly and reinforced. Literature across health care disciplines has found that unless reinforcement occurs, most psychomotor skills fall below the competency level at between 2 and 4 months (Lammers, 2008; Madden, 2006; Oermann, Kardong-Edgren, & Odom-Maryon, 2011; Patel, Posencheg, & Ades, 2012).

If faculty members are aware of the psychomotor skills deficit that students have leaving training, perhaps, they hope that students will practice and perfect their skills once they are working full time. However, this assumption is problematic because experience does not guarantee that a nurse will develop good psychomotor skills. A study of skill development during the first year of nursing practice demonstrates that some nurses' skills improved, some nurses' skills stayed the same, and other nurses' skills declined (Bjork & Kirkevold, 1999). For example, nurses whose skills declined were noted to not perform hand hygiene or use gloves correctly. Data from nursing employers also revealed concerns about how new graduate nurses perform psychomotor skills. For example, a nationally representative survey of 5,700 front-line nursing leaders from the United States found that only 66% agreed or tended to agree with the statement that they were satisfied with the clinical skills of new graduate nurses (Berkow, Virkstis, Stewart, & Conway, 2009). Another study of practicing nurses found that although they rated themselves as "competent" or "highly competent" in performing central line care, 86% of the participants breached sterile technique during the procedure (Taylor, 2012). These studies provide evidence that, even with experience, practicing nurses sometimes omit basic components of nursing skills.

There are many ways to teach psychomotor skills and significant variation among curricula. When and how to teach these skills most effectively, given limited faculty time and resources, remains unclear. There is general agreement in the literature that there is a lack of well-designed studies to guide faculty members to most effectively teach students how to both retain and transfer skills into their clinical practice (Lynagh, Burton, & Sanson-Fisher, 2007).

When psychomotor skills are performed poorly in the clinical setting, complications such as infection may result. The Centers for Disease Control and Prevention noted that central-line-associated bloodstream infections have decreased 50% between 2008 and 2014, but there was no change in the rate of catheter-associated urinary tract infections (Centers for Disease Control and Prevention, 2016). In addition to causing significant morbidity and mortality, these infections carry significant cost to the health care system. For example, Zimlichman et al. (2013) noted that the average cost of a central-line-associated bloodstream infection was $45,814 and the average cost of a catheter-associated urinary tract infection was $896. Thus, improving psychomotor skill performance could improve both patient safety and health care costs.

How Can Qualitative Data Help Us Teach Skills More Effectively?

In the nursing literature, skill acquisition has typically been studied using experimental research designs. Reviews of skill acquisition studies (Knight, 1998; Ross, 2012) found that the majority of studies had small samples sizes and significant design flaws. One of the most problematic issues in studying skill acquisition is determining how to measure skill performance (Knight, 1998). Most researchers use skill checklists, but there are potential issues with the reliability and validity of this approach. There is a lack of agreement about the importance of the number or order of steps in a skill versus ultimately completing the skill successfully. For example, does it matter whether the student performs the steps in a certain order or omits a minor step in the procedure? Is the best measure of performance completing the procedure successfully? These questions reveal a lack of satisfying information in many quantitative studies about skill acquisition.

Although we traditionally think of psychomotor skills as being a physical process, it is also important to consider how the affective state affects skill acquisition. Historically, many theories about skill acquisition have focused on the cognitive processes involved in performing a skill, such as the steps in the task, the rehearsal process, and recall mechanisms (Langan-Fox, Armstrong, Balvin, & Anglim, 2002). However, emotional aspects of skill performance are likely present as well. One model that helps explain the role of one's affective state is to think of the human brain as triune, controlling physical activity, emotion, and cognition (Ferro, 1993). For example, if a nurse who is proficient in venipuncture knows that a patient is extremely anxious about having blood drawn and that two other nurses have tried to obtain blood and failed, does that nurse perform the skill with ease? Or do the emotions of the situation affect the nurse's ability to perform the skill? There may be strategies nurse educators could employ when teaching psychomotor skills that could help students be aware of the affective components of skill acquisition, such as creating self-awareness or a positive self-concept (Langan-Fox et al., 2002). Information about the role of affective processes in skill acquisition is likely best studied through qualitative methodology.

In addition, the process of skill acquisition is likely not the same for every student. Faculty members can probably recall students who learned skills easily and others who struggled; the reasons behind these differences in skill acquisition may come to light with qualitative research. Having a better understanding of the role of affective processes and individual variation in skill acquisition may allow nursing faculty members to teach skills more effectively.

Methodology

The overarching question of this literature review was as follows: What are nursing students' perceptions of learning psychomotor skills? Electronic databases, including ERIC, ProQuest, CINAHL, and Medline were searched using the keywords *skill acquisition, student attitudes, student perceptions, psychomotor skills, skills laboratory, learning*, and *nursing students*. These databases were chosen because of their broad coverage of peer-reviewed journals for the nursing, health care, and education disciplines.

Inclusion and Exclusion Criteria

Inclusion criteria were identified in order to focus the review. Articles discussing student perceptions of skill learning, qualitative research, student attitudes about skill learning, and experiences in skills laboratories were included. Articles involving diploma, associate, and baccalaureate nursing programs were all included. Studies involving nursing students from any country were included, although the article had to be written in the English language to be included in the review.

Exclusion criteria included studies that used only quantitative methodology, dealt with skill retention rather than acquisition, focused on high-fidelity simulation as a method for skills learning, or studied nonnursing populations or nurses already in practice. Studies that examined clinical transference of skills or how nursing students perform skills in the clinical setting were also excluded.

Search Results and Review Process

The initial search with the above keywords and publication dates of 2005 to 2015 yielded few results, so the search was widened to

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