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An integrated model for the effects of self-reflection and clinical experiential learning on clinical nursing performance in nursing students: A longitudinal study

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ABSTRACT

Background: The use of clinical simulation in undergraduate nursing programs in Taiwan has gradually increased over the past 5 years. Previous research has shown that students' experience of anxiety during simulated laboratory sessions influences their self-reflection and learning effectiveness. Thus, further study that tracks what influences students' clinical performance in actual clinical sites is vital.
Objective: The aim of the study is to develop an integrated model that considers the associations among anxiety, self-reflection, and learning effectiveness and to understand how this model applies to student nurses' clinical performance while on clinical placement.
Design: This study used a correlational and longitudinal study design.
Methods: The 80 nursing students, who ranged in age from 19 to 21 (mean = 20.38, SD = 0.56), were recruited from a nursing school in southern Taiwan. Data were collected during three phases of implementation using four questionnaires. During the first phase, the State-Trait Anxiety Inventory (STAI), Simulation Learning Effectiveness Scale (SLES), and Self-Reflection and Insight Scale (SRIS) were used after students completed the simulation course in the school simulation laboratory. Nursing students also completed the Holistic Nursing Competence Scale at 2 months (Phase 2) and 4 months (Phase 3) after clinical practice experience. In Phase 3, students again completed the STAI and SRIS. Partial least squares (PLS), a structural equation modeling (SEM) procedure, was used to test the research model.
Results: The findings showed that: (1) at the start of the simulation laboratory, anxiety had a significant negative effect on students' simulation learning effectiveness (SLE; $\beta = -0.14$, $p < 0.05$) and on self-reflection with insight (SRI; $\beta = -0.52$, $p < 0.01$). Self-reflection also had a significant positive effect on simulation learning effectiveness ($\beta = 0.37$, $p < 0.01$). Anxiety had a significant negative effect on students' nursing competence during the first 2 months of practice in a clinical nursing site ($\beta = -0.20$, $p < 0.01$). Simulation learning effectiveness and self-reflection and insight also had a significant positive effect on nursing competence during the first 2 months of practice in a clinical site ($\beta = 0.13$; $\beta = 0.16$, $p < 0.05$), respectively; and (2) when students practice in a clinical setting, their previous experience of nursing competence during the first 2 months of clinical care and their self-reflection and insight have a significant positive effect on their 4-month nursing competence ($\beta = 0.58$; $\beta = 0.27$, $p < 0.01$). Anxiety, however, had a negative effect on 4-month nursing competence but not significantly. Overall, 41% of the variance in clinical nursing performance was accounted for by the variables in the integrated model.
Conclusion: This study highlights that self-reflection with insight and clinical experience may help students to deflect anxiety that may influence the development of clinical competence. Of note is that real-life clinical experience has a stronger effect on enhancing clinical performance than does a simulation experience.

1. Introduction

Nursing is a practice-based discipline, and clinical education plays an important role in cultivating nursing clinical competence in clinical sites. To achieve such competence, student access to clinical sites is essential. Traditional nursing clinical education with patients, carried out in the hospital, is often considered the gold standard (Kimhi et al., 2016). In recent years, with a focus on patient safety, students' clinical experiential learning has been moved to the school simulation laboratory, which incorporates patient simulations and other environmental design factors (e.g., suction/oxygen equipment, EKG monitor). Although some studies have found that simulation programs can improve

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students' development of clinical judgment (Shin et al., 2015), other studies have found that nursing students encounter anxiety (Stunden et al., 2015) in the simulation environment, which can affect their self-reflection and learning effectiveness (Hutchinson and Goodin, 2013).

Kolb (as cited in Lisko and O'Dell, 2010) describes experiences as involving apprehension or comprehension, in which "apprehension is viewed as participation in the actual experience, whereas comprehension occurs outside the actual experience through abstract conceptualization" (p. 106). Abstract conceptualization refers to a person's thinking in terms of using logic, ideas, and concepts. It emphasizes thinking as opposed to feeling (Kolb, 1984). These concepts are pertinent to nursing education, and although simulation programs provide a near-actual context, they are still different from the actual clinical context. Schoening et al. (2006) found that the students felt that the simulation clinical experience was an effective vehicle to increase their confidence in the clinical setting (simulation laboratory). This also was found in Stunden et al.'s (2015) review of the literature. It is not known, however, whether this actually occurs in the clinical setting. Decker et al. (2008) indicated that research is needed to support the integration of simulation into competence testing (e.g., critical- and reflective-thinking skills, safe patient care). Dillon et al. (2004) stated that research is needed to investigate whether the performance in a simulated environment translates to the patient-care setting. In any case, Kolb's experiential learning theory posits that real-life clinical experience is the best means to practice integration of critical thinking experiences into nursing education.

There is limited evidence as to whether students' performance in the clinical simulation laboratory positively or negatively affects their performance in an actual clinical site. Therefore, the aim of this study was to develop a model that accounts for the relationship between the experiences of nursing students in a school simulation laboratory with their performance in an actual clinical setting. In this study, the experiences of students in the school simulation laboratory include anxiety, self-reflection, and learning effectiveness.

2. Background

2.1. Association between Anxiety, Self-Reflection, Learning Effectiveness, and Nursing Competence

Simulated learning opportunities that integrate feedback, debriefing, or guided reflection have been shown to facilitate critical thinking skills and clinical judgment and to increase the nurses' care ability (Bruce et al., 2003). A number of research studies have found that students reported an increase in self-efficacy of care skill (Bambini et al., 2009; Kameg et al., 2010) and an improvement in their clinical judgment (Lasater, 2007) after participating in a clinical simulation experience. Based on a review of the literature, Stunden et al. (2015) also reported an improvement in students' clinical judgment (decision-making skills) after participating in clinical simulation in the laboratory. A meta-analysis (Shin et al., 2015) also indicated that simulation in nursing had benefits for learning outcomes, including improving knowledge, skills, and behavioral outcomes. Some studies also have shown a significant decrease in the number of medication errors (Sears et al., 2010) when clinical simulation was previously used. Bremner et al. (2006) found that, of students who participated in simulation laboratory practice, 61% felt more confident and less stressed during their first day of clinical practice.

Nevertheless, a systematic literature review shows that simulation is a further cause for anxiety (Stunden et al., 2015). Nursing students may experience anxiety that can interfere with learning and critical thinking, whether through experiential learning in a simulation course or live clinical experiences (Hutchinson and Goodin, 2013). Cheung and Au (2011) suggested that managing clinical training site anxiety among nursing students could help to improve learning and clinical

performance. Another study showed that self-reflection and insight affected students' nursing competence during the practice period (Eng and Pai, 2015). Self-efficacy and test anxiety emerged as the best predictors of performance (Pintrich and de Groot, 1990). It has become clear that students' anxiety, critical thinking, and learning effectiveness in the simulation laboratory have the potential to influence their performance in an actual clinical site.

Harris (2005) indicated that the self-reflective process can result in behavioral change, enhanced problem-solving capability, and personal awareness as well as improved patient clinical care. Bremner et al. (2006) stated that the use of human simulation in the education of healthcare professionals has the potential to prepare students more effectively for real-life patient care experiences. There is little evidence, however, on how students' experiences in the simulation laboratory affects their clinical performance in an actual clinical site. Thus, there is a need for a long-term study to demonstrate the effects of a simulation laboratory.

2.2. Experiential Learning and Clinical Nursing Performance

Kolb (1984) described experiential learning as a holistic integrative perspective that combines experience, perception, cognition, and behavior. Kolb explained that experiential learning involves transactions between the person and the environment, and learning as a process whereby concepts are derived from and continuously modified by experience. As such, learning is grounded in experience. For nursing education, competence in clinical care is the goal, in which experience plays a central role.

Kolb's (1984) experiential learning model (or learning cycle) involves four stages that must be present for learning to occur, including concrete experience (feeling), reflective observation (watching), abstract conceptualization (thinking), and active experimentation (doing). In this way, Kolb viewed learning as an integrated process, with each stage as mutually supportive of and feeding into the next. Although laboratory training can provide feedback and concrete experience, the simulation experience cannot be easily be generalized to the real environment.

Experiential learning through a simulated clinical setting can help students to better understand the challenges of an actual clinical setting (Dhital et al., 2015), and clinical simulation has the potential to facilitate the integral training of students (de Oliveira et al., 2015). Angel et al. (2000) studied critical thinking performance in nursing students and found that the use of an evidence-based model and clinical experience with actual patients improves nursing practice.

Kimhi et al. (2016) compared the effect of simulation and clinical experience on self-confidence/self-efficacy and found that students' self-confidence/self-efficacy following actual clinical experience was significantly higher than that following the simulation scenario. Thus, simulation may increase student's confidence in their technical skills, while experience in an actual clinical setting may increase students' confidence in their ability to use those skills with real people.

2.3. Hypothesis Development and Conceptual Framework

Our study is based on literature that shows that anxiety, learning effectiveness, and self-reflection can directly or indirectly influence holistic nursing competence (HNC) during the first 2 months of real clinical practice (HNC 2 months). Moreover, there may be a relationship among anxiety and the two variables of self-reflection and learning effectiveness. Specifically, anxiety may affect these two variables, which, in turn, may affect nursing competence during the first 2 months. Experiential learning theory also would predict a cause-and-effect relationship between holistic nursing competence and anxiety, self-reflection, and simulation learning effectiveness during the first 2 months of real clinical practice (HNC 2 months), and a relationship between nursing competence and anxiety and self-reflection during