Teaching and Learning in Nursing (2015) 10, 57–62

Teaching and Learning in Nursing

www.jtln.org

Progressive muscle relaxation to decrease anxiety in clinical simulations

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KEYWORDS:
Anxiety;
Progressive muscle relaxation;
Nursing students;
Simulation;
State Trait Anxiety Inventory

Abstract
Nursing students experience anxiety during simulations which could negatively affect learning. This pilot study examined progressive muscle relaxation to decrease anxiety. The experimental group participated in progressive muscle relaxation while the control group sat quietly. Although there were no significant differences in post-test scores, there was a significant decrease in anxiety from the experimental group pre-test to their post-test ($p < .01$). Student comments suggest progressive muscle relaxation was helpful in improving communication and cognition.

1. Introduction

Nursing school is challenging and many nursing students experience anxiety (Cordeau, 2010; Levett-Jones & Lathlean, 2008; McKay, Buen, Bohan, & Maye, 2010; Melvincavage, 2011; Pulido-Martos, Augusto-Landa, & Lopez-Zafra, 2011). This anxiety appears to occur more frequently in nursing than other majors. In a study comparing nursing students to high school and college students, nursing students had a higher level of anxiety; 56% compared to 35% (Driscoll, Evans, Ramsey, & Wheeler, 2009). Not only do nursing students have academic stressors, but they engage in demanding clinical rotations which can contribute to anxiety (Melvincavage, 2011; Pulido-Martos et al., 2011). Clinical experiences can place students in emotionally-taxing situations, including patients in pain, suffering, or dying (Rees, 2013; Terry & Carroll, 2008). In addition, they are required to perform psychomotor skills correctly while being observed by an instructor, which may also increase anxiety (Cheung & Au, 2011).

The question arises: could the anxiety associated with clinical experiences be detrimental to learning? One study showed a moderate amount of anxiety increased performance (Salthouse, 2012), however others have demonstrated high anxiety negatively affected academic performance (Coy, O'Brien, Tabaczynski, Northern, & Carels, 2011; Owens, Stevenson, Hadwin, & Norgate, 2012). Anxiety also resulted in impeding time management which is necessary in clinical situations (Kaya, Kaya, Pallos, & Kucuk, 2012). While high anxiety has been shown to negatively impact learning, there is limited data on its impact on nursing students.

Simulation is a teaching tool where students work with mannequins and participate in critical thinking and psychomotor skills in a scenario controlled by instructors (Jeffries, 2007). The National Council of State Boards of Nursing reported that 53% of schools included mandatory simulations in their nursing program and 81% would like to increase their use (Kardong-Edgren, Willhaus, Bennett, & Hayden, 2012). Some have postulated that these simulations play a role in decreasing anxiety that may occur in a clinical setting when they are used before or in conjunction with

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http://dx.doi.org/10.1016/j.teln.2015.01.002
1557-3087/

clinical rotations (Bremner, Aduddell, & Amason, 2008; Gore, Hunt, Parker, & Raines, 2011; Watt, Murphy, Pascoe, Scanlon, & Gan, 2011), yet others show that the same practice experiences in simulation have been anxiety-provoking on their own. Students have reported worrying about observation and making mistakes (Cato, 2013; McKay et al., 2010; Paskins & Peile, 2010).

There are many techniques to reduce student anxiety. Progressive muscle relaxation (PMR) is one option which involves tension and relaxation of muscle groups and may be preferable since it is easy to teach, inexpensive, safe, and effective. PMR has been shown to reduce anxiety over a period of time or for a short one-time occurrence (Ahmadnejad, Monjamed, Pakravannejad, & Malekian, 2011; Dehgham-nayeri & Adib-Hajbaghery, 2011; Dolbier & Rush, 2012). PMR could be used to assist nursing students to decrease anxiety however there have been limited studies with this population.

2. Purpose

The purpose of this pilot study was to determine the effectiveness of PMR in reducing anxiety in nursing students participating in clinical simulation. It is hoped that these students will continue using stress reduction techniques during nursing school and their career as nurses. This pilot study intended to answer the following question: for nursing students who engaged in clinical simulation, was there a difference in the anxiety level of those who participated in PMR prior to the simulation versus those who do not participate?

3. Literature Review

3.1. Anxiety in Simulation

Simulation causes anxiety in many students. In a study of foundational-level nursing students ($N = 124$), one third reported anxiety hindered their performance (Beischel, 2011). Quantitative results did not demonstrate a correlation between anxiety and cognitive impairment, yet many students perceived a relationship existed. A qualitative study reported students ($N = 9$) claimed anxiety in simulations caused problems with memory and concentration due to fear of the unknown, fear of failure, presence of instructors, and videotaping (Cato, 2013). In a focus group of 28 English medical students, anxiety in simulation was reported (Paskins & Peile, 2010). One student mentioned he experienced more anxiety than in real life, since he would receive help when in a hospital, yet not during simulations. In a qualitative review of 19 nursing student's experiences after simulation, the students reported anxiety due to fear of failure and lack of knowledge of expectations even though they were allowed to practice prior to the simulation (Cordeau, 2010). Multiple studies have shown that students reported significant anxiety surrounding clinical simulation.

3.2. Effect of Anxiety on Learning

There have been conflicting findings on the influence of anxiety on learning. In children, anxiety correlated with decreased academic scores (Owens et al., 2012). Anxiety levels were measured for 80 children using the State Trait Anxiety Inventory (STAI) and students with high anxiety were found to have decreased memory as well as decreased math and science scores. Similar results were found in undergraduate students (Coy et al., 2011; Northern, 2010). Coy et al. recruited 88 students who were randomly placed in two groups; one group was given instructions meant to induce anxiety while the other group was given neutral instructions. Northern (2010) conducted a similar study. Both studies showed students with high anxiety levels had more negative self-talk which resulted in decreased performance in verbal skills.

Not all studies support the negative impact of anxiety on learning. The results of one study of nursing students failed to demonstrate a relationship between learning and anxiety (Beischel, 2011). Students with higher anxiety scored lower on a cognitive test, but the results were not significant. Salthouse (2012) demonstrated a medium anxiety level was associated with the highest level of performance. Overall, it seems moderate anxiety levels may assist learning, while high levels can impair learning. These studies attempted to explain the relationship between anxiety and learning, however only one study included simulation scenarios or nursing students.

Harvey, Bandiera, Nathens, and LeBlanc (2012) studied 13 medical students and the role anxiety played during clinical simulation. Each student participated in a high and low stress simulation, providing their own controls. High anxiety levels resulted in decreased performance. This study provides more evidence that high anxiety levels resulted in decreased cognitive performance.

Anxiety in nursing students appears to negatively influence psychomotor skills and time management. In one qualitative study, 224 nursing students in Norway reported a large component in learning psychomotor skills was feeling secure (Strand, Naden, & Slettebo, 2009). Another study focused on psychomotor skills of 30 nursing students in Hong Kong (Cheung & Au, 2011). Students performed a new technique after watching videos; one video was anxiety-inducing and the other was neutral. The results revealed students with anxiety did not perform well. In addition, time management can be affected. A correlational study involving 584 nursing and midwifery students demonstrated students with anxiety had poor time management skills (Kaya et al., 2012). The effect anxiety has on learning is complex, but it appears not all anxiety is detrimental. High levels appear to lead to negative time management, cognitive, and psychomotor performance.