Featured Article

Does Nursing Student Self-efficacy Correlate with Knowledge When Using Human Patient Simulation?

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Abstract
Background: Self-efficacy (SE) is commonly believed to be associated with nursing knowledge and is thought to be improved with manikin-based human patient simulation (HPS) training. Yet there is little evidence of a relationship between SE and knowledge.
Methods: Using a 2-group (HPS and control) experimental design, we examined the relationship of knowledge and SE and the predictors of knowledge scores in 161 students (age 25.7 ± 6.6; 89% female) from 4 prelicensure cohorts at three nursing schools. Knowledge and SE assessments were given at two testing points: Baseline and after HPS. Statistical analyses consisted of Pearson's correlations, analysis of variance, and multivariate logistic regression with the covariates of group (HPS or control), gender, ethnicity, SE and knowledge at baseline, school, and number of prior HPS exposure(s).
Results: Significant score increases in SE and knowledge were seen between the testing points for the experimental group (had HPS), but not the control group (no HPS) and differences were found between the groups for both variables ($p < .01$ for each). However, there was no correlation between SE and knowledge. Additionally, a logistic regression for "high" SE scores revealed baseline SE ($p \leq .01$) and HPS participation ($p = .002$) as the only predictors of higher SE scores. Furthermore, SE was not a predictor of "good" knowledge scores.
Conclusion: This study demonstrated SE and knowledge gains in subjects who participated in HPS; however, there was no correlation between SE and knowledge nor was SE a predictor of "good" knowledge scores. Although educators strive to develop SE in their students, the limitations of SE's impact on outcome measures such as knowledge needs to be established.

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Self-efficacy (SE) is the belief that one is capable of performing a task or a desired action (Bandura, 1977). Arthur Bandura's SE theory (Bandura, 1977) is a

component of his more general theory, social cognitive theory. SE theory maintains that the processes of change occur through a person's sense of SE or personal mastery of a task. This includes a person's beliefs in their capability to mobilize a course of action necessary to complete a task despite changing circumstances (Kisiel, 2006). SE is commonly believed to be associated with nursing knowledge and is thought to be improved with manikin-based human patient simulation (HPS) training. However, there is little evidence of a relationship between SE and knowledge. Although there are many publications reporting improvements in SE after HPS, this study seeks to quantify its value in relation to HPS knowledge gains.

> **Key Points**
> - Self-efficacy is the belief a person can accomplish an action.
> - Self-efficacy is commonly used to measure the success of HPS.
> - No evidence of a relationship between self-efficacy and knowledge.

Literature Review

SE

A meta-analysis done by Bandura and Locke (2003) of SE research has shown that efficacy beliefs contribute significantly to the level of motivation and performance of a person in areas other than nursing. These studies have shown that belief of one's SE can predict one's functioning at different levels of efficacy over time and even variation within the same individual depending on the tasks performed. When predicting behavior, measures of SE have been found to be superior to evaluation of past performance, however these have not been tested in nursing (Scott and & MacInnes, 2006), nor have they been correlated with knowledge.

SE and HPS

HPS is popular in nursing education as a method of training safe, competent practitioners. However, educators in the literature have used SE as a barometer of success after HPS (Bambini, Washburn, & Perkins, 2009; Brown, 2008; Cardoza & Hood, 2012; Kameg, Howard, Clochesy, Mitchell, & Suresky, 2010; Lauder et al., 2008; Leigh, 2008b; Ravert, 2004; Tuttle, 2009). This is owing to the belief that students need confidence to be successful in healthcare and that SE correlates strongly with knowledge (Lauder et al., 2008; Lundberg, 2008; Pike & O'Donnell, 2010). Nonetheless, there is no evidence that SE is associated with knowledge in healthcare.

HPS and Knowledge

Although some investigators have reported knowledge gains using HPS (Alinier, Hunt, Gordon, & Colin, 2006; Brannan, White, & Bezanson, 2008; Jeffries & Rizzolo, 2006; Kardong-Edgren, Lundstrom, & Bendel, 2009; Linden, 2008; Ravert, 2004; Shinnick, Woo, Horwich, & Steadman, 2011; Shinnick & Woo, 2012), there continues to be a preponderance of published studies touting the benefits of HPS based solely on gains in student confidence or SE (Bearnson & Wiker, 2005; Bremner, Aduddell, Bennett, & VanGeest, 2006; Brown & Chronister, 2009; Feingold, Calaluce, & Kallen, 2004; Gordon & Buckley, 2009; Jarzemsky & McGrath, 2008; Kameg et al., 2010; Leigh, 2008a; Nishisaki, Keren, & Nadharni, 2007; Pike & O'Donnell, 2010; Reznek et al., 2003; Sherman, 2002; Smith, 2008; Taekman, Hobbs, & Wright, 2007; Tuttle, 2009). However, the relationships between SE and knowledge and HPS are unclear.

Heart failure (HF) is the most common hospital discharge diagnosis in persons >65 years old (Miller & Missov, 2001; Sturm, van Gilst, Swedberg, Hobbs, & Haaijer-Ruskamp, 2005). Therefore, improving both knowledge and SE in HF are important in the training of healthcare providers. However, there is little information on the relationship of HPS with HF knowledge and SE in the training of healthcare providers.

There is a paucity of evidence in the literature correlating SE with knowledge or identifying the value of SE as a predictor of knowledge in HF in healthcare trainees, particularly in relationship to HPS. Therefore, the specific aims of this study were to (1) determine whether SE in areas of HF management (as measured by the SE for nursing skills evaluation tool) is correlated to knowledge scores (as measured by the HF clinical knowledge questionnaire) in prelicensure nursing students with and without an HPS experience, (2) identify if SE is a predictor of "good" HF knowledge scores ($\geq 75\%$ on the HF clinical knowledge questionnaire), and (3) determine the predictors of "high" HF SE (scores ≥ 3 ["moderately confident"]) as measured on by the SE for nursing skills evaluation tool.

Methods

Study Design and Sample

The study used a 2-group, randomized, pretest–posttest, clinical trial design. The groups consisted of the experimental subjects (who were randomized to 1 of 3 parallel HF scenarios in HPS) and controls (who did not participate in HPS). Both groups were measured at baseline (pretest) and posttest (for the experimental group, after HPS; for the controls, at the same amount of time as the post-HPS testing period for the experimental subjects; Figure 1).