Phlebotomy-Related Self-Efficacy in Long Island Nursing Students: A Pilot Study

Christine M. Nebocat, DHEd, MLS (ASCP)CM, CHES

Theresa Santmann School of Health Sciences- 241 Gleeson Hall, Farmingdale State College, 2350 Broadhollow Road, Farmingdale, NY 11735, USA

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Abstract

Hands-on phlebotomy training is often absent from undergraduate nursing curricula. Hands-on skill training improves student nurses’ self-efficacy, resulting in positive outcomes for the novice nurse and patients. A quantitative pilot study was implemented to determine if a 3-hr hands-on phlebotomy training seminar would affect the self-efficacy of undergraduate nursing students. Self-efficacy scores were higher in the intervention group than the comparison group. A hands-on phlebotomy training seminar should be offered as an elective for undergraduate nursing students to improve levels of self-efficacy.

Introduction

Phlebotomy, a task that is within the scope of practice for nurses, is not typically included in undergraduate nursing curricula. Nurses may be expected to perform venipuncture on patients depending on the position, location, shift, and facility in which they work. However, training is usually conducted in the field. With a lack of hands-on phlebotomy training in undergraduate nursing programs, self-efficacy may be lacking. This leads to a higher risk for patient-related complications and self-inflicted injuries.

Background: Phlebotomy-Related Complications

Improper specimen collection via venipuncture may result in increased patient discomfort, delayed results, and a higher rate of abandoned tests (Karcher & Lehman, 2014). Furthermore, inadequate training may result in unnecessary patient complications such as nerve damage, hematomas, and neuropathic pain (Fujii, 2014). Self-inflicted injuries are also a concern for nurses who perform phlebotomy. According to Laishram et al. (2013), needle-stick injuries (NSIs) are often unreported. NSIs increase the risk for acquiring diseases such as Hepatitis or HIV. In the study conducted by Laishram et al. (2013), it was calculated that 37.6% of health care workers contracted Hepatitis B, 39% contracted Hepatitis C, and 4.4% contracted HIV via NSIs.

The American Association of Colleges of Nursing (AACN, 2008) has published a set of national standards used as a guide to assess skills, knowledge, and attitudes of nursing graduates. Essential IX, with a focus on general nursing practice, states that a nursing program should prepare graduates to “Create a safe care environment that results in high quality patient outcomes” (AACN, 2008, p.31) and “Demonstrate the application of psychomotor skills for the efficient, safe, and compassionate delivery of patient care” (AACN, 2008, p.32). Furthermore, the American Nurses Association (2010) encourages nurses to practice autonomy founded on competence, assuring safety to the public. Without adequate phlebotomy training in undergraduate curricula, nursing students are not prepared to fulfill the guidelines set forth by the AACN and American Nurses Association, if they are expected to perform venipuncture.

Self-Efficacy and the Social Cognitive Theory: Theoretical Framework

According to Bandura (1986), self-efficacy is the core of the social cognitive theory. Self-efficacy refers to the manner in which an individual judges his or her capabilities and how this affects their attitude, behavior, and motivation in completing a task. An individual with a higher level of self-efficacy would be motivated to approach a challenging task directly, whereas an individual with low self-efficacy may try to avoid the task. Low self-efficacy also correlates with increased levels of stress and depression; a failed pursuit is often viewed as a personal deficiency (Bandura, 1994).
A vicarious experience, such as watching another individual perform an intimidating task, or a performance accomplishment, such as hands-on practicing of a task, are two educational strategies that can be incorporated to improve self-efficacy (Bandura, 1977). Through a concept analysis, Townsend and Scanlan (2011) concluded that a direct relationship exists between self-efficacy and performance in nursing students in the clinical setting. Another concept analysis conducted by Robb (2012) found similar results, noting “a link exists between perceived self-efficacy and acquisition of clinical skills” (p. 170). Robb concluded that without adequate self-efficacy, nursing students were unable to attain competence in clinical skills.

**Hands-On Simulation Training to Improve Self-Efficacy**

Kimhi et al. (2016) studied self-efficacy of nursing students who completed hands-on training through both clinical experiences and simulation training. It was found that both traditional clinical training and simulation training improved student self-efficacy, regardless of when these hands-on strategies were incorporated into the curriculum (Kimhi et al., 2016). Without adequate hands-on phlebotomy training, novice nurses may have low self-efficacy in regard to this skill. This may result in avoidance, or hesitation to perform venipuncture on a patient, and difficulty attaining competence in the skill.

According to Robb (2012), incorporation of clinical simulation training increases students’ perceived self-efficacy, ability to attain knowledge, critical thinking skills, and level of confidence. Without an adequate level of self-efficacy, new nursing graduates will require additional emotional and academic support in practicing typical clinical skills (Robb, 2012). The inclusion of a hands-on phlebotomy training for undergraduate nursing students will improve phlebotomy-related self-efficacy. Hands-on simulation experiences can be used in conjunction with traditional clinical experiences to benefit nursing students (Curl, Smith, Chisholm, McGee, & Das, 2016). Beginning with simulation training on an artificial arm, students will have the opportunity to practice venipuncture, increasing students’ self-efficacy. Ultimately, self-efficacy gained through a hands-on simulation training will reduce stress, decrease avoidance, and motivate the student as they enter the field.

**Method**

The purpose of this pilot study was to determine if a hands-on phlebotomy training seminar would increase self-efficacy in a group of undergraduate nursing students. The study was conducted at a small local college in Long Island, New York. Students were separated into two groups (an intervention group and a comparison group) to participate in a simulated phlebotomy training session. The session involved an interactive lecture, expert demonstrations, and phlebotomy practice on an artificial arm. The topics that were covered included an introduction to blood collection, duties of a phlebotomist, legal concerns, standard/universal safety protocols, proper use of equipment, venous anatomy, selection of an appropriate vein and factors to consider, drawing techniques, sample requirements, patient complications, and postvene care.

A random stratified sampling method was implemented to ensure a similar number of participants from each academic grade level. Written consent was obtained from each participant, and quantitative data were coded by number to maintain confidentiality. All processes of the study were approved by the institutional review board.

The intervention group \( (n = 19) \) received the 3-hr training. The comparison group \( (n = 20) \) only observed a brief phlebotomy demonstration on an artificial arm with verbal instructions but did not receive the full training seminar. Both groups then performed phlebotomy on the artificial arm, and completed a Phlebotomy Self-Efficacy Scale (PSES) and a demographic questionnaire.

**Instrumentation- the PSES**

Of the nursing self-efficacy scales available, there is no scale that focuses primarily on one single skill. Therefore, the PSES was created by the researcher to assess perceived self-efficacy in regard to phlebotomy-related tasks. The design of the PSES was guided by Bandura (1977) and two peer-reviewed nursing student self-efficacy scales, the Nursing Student Self-Efficacy Survey (Stump, Husman, & Brem, 2012) and the Clinical Skills Self-Efficacy Scale (Oetker-Black, Kreye, Underwood, Price, & DeMetro, 2014).

The PSES is a Likert-type instrument with 12 items that are scored on an 11-point scale (see Appendix A). The items selected for the PSES were recommended by Ernst and Ernst (2001) in a phlebotomy checklist for nurses. Ernst and Ernst (2001), a medical laboratory scientist (MLS) and a nurse, are the only researchers who have written an academic book specifically addressing phlebotomy and nursing. In the PSES, a score of “0” represents I definitely need assistance or additional training to perform this task, and a score of “10” represents I can do this task independently without any assistance or additional training.

Content validity and internal consistency of the PSES were evaluated. The review panel consisted of professionals from various fields. Included in the panel were two faculty members who worked in the field of nursing and in academia and two MLS: one who worked primarily in academia and another who worked in the field of medical laboratory science in addition to academia. A statistician and a faculty member from a doctoral health education program were also involved in the review process and a group of MLS who were informally surveyed.

**Results**

**Demographics**

Quantitative data were collected from all participants. The comparison group consisted of 6 males and 14 females, 4 of which were sophomores, 10 juniors, and 6 seniors. The mean age reported was 25.85 (7.066) years. The intervention group consisted of 4 males and 14 females, 4 of which were sophomores, 10 juniors, and 5 seniors. The mean age reported was 23.26 (4.080) years. Overall the groups were comparable in composition.

**Quantitative Results**

It was hypothesized that the intervention group of nursing students who received a 3-hr hands-on phlebotomy training seminar would have increased self-efficacy in comparison to the control group of nursing students who did not receive the training. A Shapiro–Wilk test for normality was conducted and indicated a deviation from normality in the PSES scores for the intervention group \( (p = .006) \). Thus, a Mann–Whitney test was performed to compare the PSES scores for the two groups. The results of the Mann–Whitney test were statistically significant, \( U = 99.500, N_1 = 20, N_2 = 19, p = .010 \). The self-efficacy scores of the intervention group \( (M = 103.37, SD = 14.546) \) were significantly higher than the scores of the comparison group \( (M = 89.35, SD = 18.236) \). The PSES was found to have a high level of internal consistency and validity with a Cronbach’s alpha of .829.
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