Clinical Simulation in Nursing (2017) 13, 71-77

Clinical Simulation in Nursing

www.elsevier.com/locate/ecsn

Featured Article

New Nursing Graduates' Self-Efficacy Ratings and Urinary Catheterization Skills in a High-Fidelity Simulation Scenario

Melanie Cason, PhD, RN, CNE[a,*], Teresa Atz, PhD, RN, CHSE[b], Linda F. Horton, MSN, RN[c]

[a]*Assistant Professor, Medical University of South Carolina Medical Center, Charleston, SC 29425, USA*
[b]*Assistant Professor, Director of Simulation, Medical University of South Carolina College of Nursing, Charleston, SC 29425, USA*
[c]*Nursing Professional Development Facilitator, Nurse Residency Coordinator, Medical University of South Carolina, Charleston, SC 29425, USA*

KEYWORDS
high fidelity simulation;
self-efficacy;
new graduate nurses;
psychomotor competency

Abstract

Background: Transition to practice is a major concern for nurse educators, health care executives, and new nursing graduates. The disparity of nurse educators' and leaders' perceptions regarding new graduates' abilities to perform procedural skills may lead to patient harm. Pay for performance, quality indicators, and decreased reimbursement related to catheter-associated urinary tract infections have increased the need for competency validation.

Methods: A quantitative method with a descriptive correlational design provided information about the relationship of self-efficacy of the new nursing graduate and competency in urinary catheterization. Following a self-efficacy inquiry, a high-fidelity simulation was conducted for individual evaluation of the psychomotor skill of urinary catheterization.

Results: Analysis with nonparametric statistics for correlation indicated a lack of statistical significance ($p > .05$) between self-efficacy and competency in the psychomotor skill of urinary catheterization.

Conclusions: This study indicates that there is a need for validating competency in psychomotor skills within the context of a simulated patient care situation. The appropriate use of high-fidelity simulation may include incorporating self-efficacy measurements with an objective evaluation of psychomotor abilities to improve patient outcomes while increasing the accountability of the nurse.

Cite this article:
Cason, M., Atz, T., & Horton, L. F. (2017, February). New nursing graduates' self-efficacy ratings and urinary catheterization skills in a high-fidelity simulation scenario. *Clinical Simulation in Nursing, 13*(2), 71-77. http://dx.doi.org/10.1016/j.ecns.2016.12.006.

Psychomotor skill competency is an integral component of professional nursing practice. Hospital administrators identify serious gaps in expected knowledge and abilities of the new nursing graduate nationwide (Berkow, Virkstis, Stewart, & Conway, 2009; Beyea, Slattery, & Von Reyn,

There are no conflicts of interests or financial disclosures to be made by any of the authors.

* Corresponding author: casonm@musc.edu (M. Cason).

1876-1399/$ - see front matter
http://dx.doi.org/10.1016/j.ecns.2016.12.006

2010; Friedman, Cooper, Click, & Fitzpatrick, 2011). Only 10% of hospital nurse executives think that new graduate nurses are prepared to give safe care, compared with nearly 90% of nursing academic leaders who believe the graduates are ready for safe practice. Research indicates that employers rank technical skills competency below 30% for both baccalaureate (bachelor of science in nursing [BSN]) and associate (associate degree nursing [ADN]) new nursing graduates (Berkow et al., 2009). This disparity between faculty and health care leaders' perceptions suggests that the new graduate may have erroneous beliefs about their abilities leading to the potential for error and patient harm.

Key Points

- Self-efficacy evaluation and measured performance of the procedural skill of urinary catheterization may contribute to improved patient care.
- High fidelity simulation provides a context that reflects the multi-dimensional nature of nursing care.
- Future research is warranted to explore the relationship between psychomotor skill competency and clinical decision making.

Urinary catheterization is an example of a procedural skill that is required learning prior to graduation. If the new graduate has an unrealistic belief that they are competent in performing urinary catheterization, a potential harm to the patient may exist. Catheter-associated urinary tract infections (CAUTIs) rates are reported nationally as a nursing quality indicator with implications for decreased reimbursement. In addition to patient harm, the health care facility must absorb several thousand dollars per occurrence of hospital-acquired CAUTIs (Center for Disease Control, 2014; Marigliano, Barbadoro, Pennacchietti, D'Errico, & Porspero, 2012).

Validation of competency in procedural skills can vary greatly depending on the resources and requirements of the health care organization. High-stakes summative evaluation of psychomotor skills in nursing education lags behind medical education, and there is also a potential for increased evaluation of nursing competency with simulation scenarios (Kardong-Edgren, 2013; Ruth-Sahd, 2013). Evaluation of urinary catheterization skills of the newly hired nursing graduate may reveal how well-prepared they are to prevent hospital-acquired infections and safely practice in the workforce. The self-awareness of a new graduate's abilities may contribute to the cognizance to ask for information or assistance when needed from lack of practice or knowledge. Therefore, this study seeks to explore the relationship of the new nursing graduate's self-efficacy and procedural competency in urinary catheterization.

Background

The literature indicates that a primary focus of nursing education is in the area of teaching the student to think critically by assimilating information to solve problems (Allen, 2010; Gantt, 2010; Wood & Toronto, 2012). Interventions for improving the competency of new graduate nurses also include focuses on communication, leadership, organization, specific situations, critical thinking, clinical reasoning, and stress management (Theisen & Sandau, 2013). Nursing education has evolved to a higher cognitive level from hospital-based diploma schools providing many clinical opportunities emphasizing task completion (Benner, Sutphen, Leonard, & Day, 2010). The present day clinical environment limits nursing students to certain procedures and reduces clinical opportunities in acute care settings. Today, psychomotor skills are taught at the beginning of nursing school in a foundations or fundamentals course usually with static manikins or task trainers (Jeffries, 2012; McNelis, Jeffries, Hensel, & Anderson, 2009). Procedures are performed by the nursing student in the clinical setting on actual patients when the opportunity arises and facility policy allows (Benner et al., 2010). Medical education and competency assessment data indicate how high-fidelity simulation can be an effective way to practice and incorporate procedures into patient-centered care (McGaghie, Issenberg, Petrusa, & Scalese, 2010; Rudolph, Simon, & Raemer, 2007). Despite this, there is a paucity of evidence for best practices in the use of simulation in new nursing graduate orientation or nurse residency programs (Hillman & Foster, 2010; Kowalski & Cross, 2010; Olejniczak, Schmidt, & Brown, 2010). However, a recent experiential learning approach using simulation for nursing orientation that included both new graduates and experienced nurses reduced orientation time to more than 35% with a substantial cost savings at an academic medical center (Zigmont et al., 2015).

In contrast, noting the paucity of evidence correlating self-efficacy in relation to human patient simulation, Shinnick and Woo (2014) focused on nursing knowledge and the self-efficacy of the student when using simulation. Using an experimental design, the relationship between knowledge and self-efficacy and predictors of knowledge was studied to determine if there was improvement in self-efficacy with the use of manikin-based high-fidelity simulation. Undergraduate senior nursing students ($N = 161$) were randomized into a two-group clinical trial design with pretest–posttest measurements. It is worthy to note that Shinnick and Woo (2014) constructed their study around knowledge of congestive heart failure, not psychomotor skill ability. Statistical analysis of the study indicates increases between the variables of self-efficacy and knowledge in the management of a heart failure patient in both the experimental group using simulation and a control group ($p < .01$). Pearson's correlation between self-efficacy measures and knowledge was nonsignificant, but there were significant pretest correlations for self-efficacy, and specific actions of physician order prioritization and management of fluid status. Improvements in self-efficacy following simulation experiences are noted, but there is an absence of measurement beyond improved self-confidence (Shinnick &Woo, 2014). This study did not provide measurement regarding the individual performance in the simulation; the simulation provided the intervention for the experimental group. Psychomotor skills within the simulation were not stated or evaluated in this study.

Current research focuses on improvements in self-efficacy with simulation experiences, but not the relationship to basic psychomotor abilities of the nurse (Akhu-Zaheya, Gharaibeh, & Alostaz, 2013; Fadale, Tucker, Dungan, & Sabol, 2014; Kameg, Clochesy, Mitchell, & Suresky, 2010; Roh, 2014; Tiffen, Graf, & Corbridge, 2009). An example is the recently developed Clinical Skills Self-Efficacy Scale (CSES) that has been developed and piloted with evidence of validity and reliability (Oetker-Black, Kreye, Davis, Underwood, & Naug, 2016). The CSES consists of confidence scales ranging from 0 to 10 from *no confidence* to *total confidence*. In establishing content validity, three clinical skills including intramuscular injections, sterile dressing, and intravenous piggy back medication administration were considered. The two groups included those students who had already performed the skill and those who had not. The results indicated that prior performance increases self-efficacy in nursing students. Transferal of skills to the clinical setting was identified as a need for future research (Oetker-Black et al., 2016). A gap in the literature was identified related to the measure of the relationship of self-efficacy and standardized performance in urinary catheterization using high-fidelity simulation.

Conceptual Framework

The nature of the study was to explore the relationship between self-efficacy of psychomotor skills of new nursing graduates to the actual performance of psychomotor skills. A quantitative descriptive correlational design investigated the relationship between self-efficacy and psychomotor skill competency of the new nursing graduate required the development of a conceptual framework that included three elements. These elements were the baseline self-awareness of abilities, the application of nursing knowledge, and the observable, quantifiable abilities for competency evaluation. The complexity of transition to practice of the new graduate required an innovative integration of established models and theories in order to provide an adequate framework. A unique original conceptual framework integrating Bandura's Social Cognitive Theory, Benner's Novice to Expert Model, and Miller's Pyramid of Clinical Competency guided the study and supports both the art and science of nursing.

Self-efficacy beliefs may influence the ability to successfully complete procedural tasks (Bandura, 1993; Robb, 2012). Meeting patient care needs requires integration of psychomotor skills with higher level clinical judgment such as communication techniques. Establishing a baseline for performance of psychomotor skills for the individual in relation to their self-efficacy beliefs may allow for insight into abilities and the opportunity to improve to a competent level. Advances in research and emerging technology in neurophysiology allow for consideration of the cognitive and behavioral influences on performance (Clapper, 2010; Clapper & Kardong-Edgren, 2012; Vaesen, 2012).

Urinary catheterization is an example of a measurable psychomotor skill. For the purpose of evaluating urinary catheterization in the context of a high-fidelity simulation scenario, the combined Benner—Miller model emphasizes the importance of psychomotor skill acquisition as an integral component contributing to professional competency. The skill of urinary catheterization requires creating and maintaining a sterile field, psychomotor dexterity, and providing patient education. An embedded evidence-based checklist for grading was programmed into the scenario software for the simulation of the skill at the "shows" level of the model for demonstration of previous learning of the procedure. Prior to conducting the catheterization, the self-efficacy rating indicated the degree the new nurse graduates believe they are capable of successfully completing the task. The powerful component of self-efficacy is the ability to manage or not manage the situation, provided an opportunity to explore the realm of perception and psychomotor skill ability.

Methods

The study examined a convenience sample of new nursing graduates in a nurse residency program at a large academic medical center in the southeastern United States in an effort to understand the potential relationship of self-efficacy and psychomotor skill ability. The medical center has a large population of approximately 120 new nursing graduates annually. During the three months of the study, the number of new nursing graduates hired was approximately 30 every two weeks.

The self-assessment tool, the Casey—Fink New Graduate Survey, utilized by the UHCC Nurse Residency Program (UHC/AACN, 2014) does not emphasize clinical psychomotor skills. The Casey—Fink New Graduate Survey does have a free text, nonranked section for graduates to write in the top three skills that they are most uncomfortable performing (Casey et al., 2011). This survey provides general information to the nurse residency coordinator about the comfort levels of the new graduates without specifics.

Therefore, the Clinical Competency Questionnaire (CCQ) was used to provide not only a quantitative measure but also an indication of the amount of assistance or supervision needed with a skill (Liou & Cheng, 2014).

Study Procedures

In accordance with the Code of Ethics of the World Medical Association (Declaration of Helsinki), the study was reviewed and approved by the medical center institutional review board. Following a detailed description of the research procedure in a face to face discussion, volunteers were recruited from every cohort of new graduates over three months. Informed consent was obtained. All the nurse residency attendees completed a self-assessment survey instrument to provide information to the nurse residency coordinator about their abilities and previous experience. The volunteers participated in a high-fidelity simulation as an individual coded with a number as an identifier. A power analysis indicated a sample size of N = 46 would be sufficient to detect a medium effect size at 80% power with significance set at 0.05.

Study Variables

Demographic data were collected via a five-item questionnaire that included experience in health care, gender, highest level of nursing education completed, age, and the frequency of simulation utilization in undergraduate education (Table 1). The CCQ is a 46-item instrument that includes categories of professional behavior, general performance, core nursing skills, and advanced nursing skills (Liou & Cheng, 2014). The purpose of the CCQ is to provide an opportunity for self-assessment of nursing professional and skill competencies. The new graduates ranked each item by a five-item Item Response Likert Scale from (1) *do not have a clue* up to (5) *know in theory*, competent in practice without supervision. Content validity of the tool was established by six undergraduate nursing faculty and experienced registered nurses prior to use in this study with content validity index and scale content validity that provided a scale content validity average of 0.97. Reliability of the tool was established with a Cronbach's alpha = 0.96.

Table 1 Demographic Characteristics of New Graduate Nurse Sample (N = 47)

Characteristics	N (%)
Prior experience	
Yes	22 (47)
No	25 (53)
Gender	
Female	42 (89)
Male	5 (11)
Education	
ADN	18 (38)
BSN	29 (62)
Age range	
18-24	11 (23)
25-34	32 (68)
35-44	3 (6)
45-54	1 (2)
Sim frequency	
Never	0 (0)
1-3 courses	6 (13)
3-4 courses	14 (30)
Every course	27 (57)
Education	
BSN	29 (62)
ADN	18 (38)

Note. ADN = associate degree nursing; BSN = bachelor of science in nursing; sim = simulation.

Competency of the actual procedure was measured with a programmed standardized check list that provided a point for each correct action taken in the urinary catheterization procedure. The Creighton Competency Evaluation Instrument (C-CEI) offers a dichotomous rating of competency or not competent for the item of *performs procedures correctly* (Todd, Manz, Hawkins, Parsons, & Hercinger, 2008). Each individual participant was observed performing the procedure while the simulator asked questions and demonstrated confusion in a patient care scenario. The programmed standardized check list was used to support the ranking of competency or not competent on the C-CEI. Reliability of the simulation and the programmed checklist was evaluated with interrater reliability rating of 0.79 for the standardized checklist. There was 100% consensus in the rating of *does not demonstrate competency.* Cohen's kappa was calculated at k = 0.737, $p < .5$, indicating a good strength of agreement that was statistically significant.

Each individual participant (N = 47) was observed from a control room in the simulation center by the simulation nurse educator for the medical center. The patient history provides the diagnosis of a recent fall and urinary retention. Following basic assessment, the physician calls in for an update and gives an order for an intermittent catheterization for urinalysis. The new graduate is then observed and checked off based on the programmed steps from the control room. The length of the simulation averaged nine to ten minutes.

Data Analysis

Data were analyzed using SPSS version 21. Demographic questions preceded the CCQ questions. Demographic information is presented in Table 1. The majority of the participants were BSN graduates, and most of the participants had simulation in every clinical course. Descriptive statistics were calculated to describe the study sample and the frequency of correct or incorrect actions. Appropriate nonparametric statistics were calculated to examine the

Table 2 Frequency Table for Self-Efficacy Ratings for Urinary Catheterization (N = 47)

CCQ Self-Efficacy Rating	N (%)
Know in theory, not confident in practice	1 (2)
Know in theory, can perform some independently, need supervision readily available	10 (21)
Know in theory, competent in practice, need contactable sources of supervision	14 (30)
Know in theory, competent in practice without supervision	22 (47)

Note. CCQ = Clinical Competency Questionnaire.

relationship of self-efficacy in urinary catheterization and procedural competency.

Results

Table 2 provides frequency information on self-efficacy levels of the new nursing graduate in the performance of urinary catheter insertion. The new nursing graduates completed the CCQ, and the item for urinary catheterization was ranked from 1 to 5, with 5 as the ability to complete in practice without supervision. There were no ratings of 1, *do not have a clue*. The range was 2 to 5, mean 4.18, and standard deviation 0.850. The majority of the sample, ranked themselves as *know in theory, competent in practice without supervision*.

The frequency of the performance of procedural steps is noted in Table 3. The step most frequently omitted was the prewash at 40%, followed by the ability to prepare aseptically.

The item on the CCQ ranking the ability to perform urinary catheterization independently was chosen by 46.8% of the participants, whereas 66% of the sample did not complete the required procedural steps to support a competent rating on the C-CEI.

As seen in Table 4 based on the analysis of data with Spearman's rank-order correlation coefficient, $r_s(45) = 0.138$, $p > .05$, and point biserial correlation statistics, $r(45) = 0.157$, $p > .05$, there was a lack of a relationship between self-efficacy of the new graduates and performance of a psychomotor skill in this sample population.

Table 3 Frequency Table for Procedural Steps for Urinary Catheterization (N = 47)

Procedural Steps	Did Not Perform, N (%)	Performed, N (%)
Prewash	19 (40)	28 (60)
Hand hygiene	1 (2)	46 (98)
Open sterile kit	8 (17)	39 (83)
Don sterile gloves	7 (15)	40 (85)
Spread labia	4 (9)	43 (91)
Maintain position	15 (32)	32 (68)
Wipe front to back	1 (2)	46 (98)
Used new swabs	2 (4)	45 (96)
Discarded swabs	1 (2)	46 (98)
Prepared aseptically	18 (38)	29 (62)

Table 4 Spearman's Correlation Coefficient Values (N = 47)

Measurements	Correlation Coefficient	p
Competency score and self-assessment	0.138	.352
Correct items and self-assessment	0.232	.117
Correct items and competency score	0.859**	.000

Note. Level of significance 0.05 (two tailed) and degrees of freedom = N−2.
**Correlation is significant at the .01 level (two tailed).

Discussion

The integrated Benner–Miller conceptual framework of progression to expert with demonstrable skills requires the correct self-efficacy perceptions in order to avoid error. The missing element in the lack of a relationship between self-efficacy and psychomotor skill competency, self-efficacy assessment, could be the basis of identification of knowledge gaps, indications for remediation, further training, and evaluation. The incongruences that exist between education and practice contribute to the evidence and the need for change.

A consideration of the appropriateness of the data collection design is the effectiveness in the scoring of procedural steps to the competency score in performing procedures correctly with the C-CEI tool. A statistically significant correlation, $r_s(45) = 0.859$, between the procedural steps assessment and the competency score was noted. The statistical significance could indicate increased objectivity with the rating due to the use of programmed procedural steps that validated competency with the C-CEI. The calculation of a score of correct procedural steps as opposed to a mere check mark may decrease variability or misinterpretation of correct steps. This study supports recommendations for both nursing education and nursing practice. It may be possible to revise traditional methods of clinical skill instruction to include individual practice in a high-fidelity complex simulated patient care scenario. The high cost of simulation equipment and faculty workload requires further research into the effects of individual high-stakes evaluation on learning outcomes. The evolution of health care and technology that allows for the integrated Benner–Miller model with self-efficacy ratings requires further testing for value in education and practice. The nursing transition to practice gap solution could include a seamless educational process with intensive simulation experiences supported with standardized formative sessions in health care organizations.

The findings in this study suggest the lack of a relationship between self-efficacy and psychomotor competency with urinary catheterization. This has particular relevance to skill laboratories and methods of instruction in nursing programs. As the literature has shown, nursing programs vary greatly in the amount and methods of simulation use for learning and evaluation. Student learning experiences with high-fidelity simulation scenarios may occur more in groups rather than individually due to faculty demands and time constraints (Cordeau, 2010). A new nursing graduate that is competent in psychomotor skills may develop higher level critical clinical judgment and cognitive abilities. The incorporation of Miller's *shows how* level with simulation with higher stakes validation could promote increased self-efficacy in psychomotor skills. The progression on Benner's Novice to Expert Scale past the advanced beginner stage for new graduates requires competency in psychomotor skills prior to graduation. It should be important to discover how the student truly feels about their psychomotor skill ability, as Bandura posits it is essential to successful completion of a task (Bandura, 1993). The self-efficacy underpinning supports individualization and recognition of the importance of self-confidence in completing psychomotor skills. The goal of producing a safe, well-rounded nurse who is capable of caring for patients competently may be realized as self-efficacy becomes a valuable consideration in learning beyond a procedural checklist. The realization that it is acceptable and desirable to know limitations and to ask for assistance is an important attribute of the professional nurse in providing safe patient care.

Nursing Practice

The implications for nursing practice include health care employers developing a structured individualized orientation period that is meaningful to the new nursing graduate. Standardization of competency validation methods are essential to uniformity and safe nursing practice. The addition of simulation to the nursing orientation process has been shown to be effective in reducing orientation time with significant cost saving (Zigmont et al., 2015). There is a need for higher level simulation scenario development that is appropriate for the new nursing graduate. The simulations could include not only psychomotor skills like urinary catheterization but also communication skills. The use of the CCQ allows for a comprehensive inquiry into behavioral skill and technical skill ability. Of interest are the lower ratings posted on the CCQ in obtaining an admission history, communication, and patient education. This further indicates the value of high-fidelity simulation with increased realism for patient care to incorporate all aspects of nursing practice.

Indications for Future Research

As the literature has shown, there is hesitancy among nursing faculty to move into higher stakes evaluation with simulation as best practices continue to be determined (Wilhaus et al., 2014). Beyond instruction, there is a need to establish the importance of the connection between self-efficacy and actual ability. Previous studies have focused on the influence of simulation on self-efficacy, but at the time of this study, none have considered the relationship of self-efficacy to nursing psychomotor skill abilities. The power of self-efficacy as supported by Bandura is essential to successful completion of a task or cognitive challenge. The question arises, could self-efficacy in psychomotor skills influence the ability to critically think and make sound clinical judgments? Future research is needed to explore the relationship between the cognitive, behavioral skills and the core nursing skills of the CCQ with regression analysis. The relationship of self-efficacy and nursing practice would seem to be worthy of research in nursing education and now with the availability of high-fidelity simulation it is possible to proceed in a safe environment.

Research about the self-efficacy of new nursing graduate incorporating a mixed-methods design is needed in order to receive qualitative and quantitative information about individual evaluation in a high-fidelity simulation. Focus groups or interviews would provide richer information about this population. The feelings and perceptions of a new graduate in an individual simulation could be explored, as many have only experienced high-fidelity simulation as a group activity. Many of the new nursing graduates stated that they had not been surveyed regarding self-efficacy in any procedures or nursing processes. Mixed-methods research design would allow for a richer exploration of the undergraduate nursing experience.

Systematic and purposeful research into the amount of simulated psychomotor training needed for retention of knowledge and transferability to patient care is needed. The effects of deliberate practice on self-efficacy as supported with validity and reliability measures, including retention of skills, is another area for future research. The influence of self-efficacy on learning, demonstrating, and retaining a skill is an example of other areas for future research. Critical thinking or clinical judgment abilities in relation to psychomotor skill competency is also an area for further research.

Conclusions

This study has provided basic information that indicates the need for future research into the application of self-efficacy determinations, psychomotor skill competency, and the relationship to cognitive abilities for nursing practice. Because technology permeates the world today, the nursing profession, both education and practice, must move forward together in developing best practices through research with simulation to promote applicable nursing education, professional competency, and patient safety. This transformation of education and practice can change the future of health care by relying on the effectiveness of the individual nurse, aware of abilities, and cognizant of the consequences of care provided.

References

Allen, S. (2010). The revolution of nursing pedagogy: A transformational process. *Teaching and Learning in Nursing*, *5*, 33-38. http://dx.doi.org/10.1016/j.teln.2009.07.001.

Akhu-Zaheya, L. M., Gharaibeh, M. K., & Alostaz, Z. M. (2013). Effectiveness of simulation on knowledge acquisition, knowledge retention, and self-efficacy of nursing students in Jordan. *Clinical Simulation in Nursing*, *9*, e335-e342. http://dx.doi.org/10.1016/j.ecns.2012.05.001.

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist*, *28*(2), 117-148.

Benner, P., Sutphen, M., Leonard, V., & Day, L. (2010). *Educating nurses: A call for radical transformation* (1st ed.). San Francisco, CA: Jossey-Bass.

Berkow, S., Virkstis, K., Stewart, J., & Conway, L. (2009). Assessing new graduate nurse performance. *Nurse Educator*, *34*, 17-22.

Beyea, S., Slattery, M. J., & Von Reyn, L. J. (2010). Outcomes of a simulation-based nurse residency program. *Clinical Simulation in Nursing*, *6*, e169-e175. http://dx.doi.org/10.1016/j.ecns.2010.01.005.

Casey, K., Fink, R., Janes, C., Campbell, L., Cook, P., & Wilson, V. (2011). Readiness for practice: The senior practicum experience. *Journal of Nursing Education*, *50*, 646-652. http://dx.doi.org/10.3928/01484834-20110817-03.

Center for Disease Control. (2014). *CAUTI*. Retrieved from http://www.cdc.gov/nhsn/pdfs/pscmanual/7pscCAUTIcurrent.pdf

Clapper, T. C. (2010). Beyond Knowles: What those conducting simulation need to know about adult learning theory. *Clinical Simulation in Nursing*, *6*, e7-e14. http://dx.doi.org/10.1016/j.ecns.2009.07.003.

Clapper, T. C., & Kardong-Edgren, S. (2012). Using deliberate practice and simulation to improve nursing skills. *Clinical Simulation in Nursing*, *8*, e109-e113. http://dx.doi.org/10.1016/jecns.2010.12.001.

Cordeau, M. A. (2010). The lived experience of clinical simulation of novice nursing students. *International Journal for Human Caring*, *14*(2), 9-15.

Fadale, K. L., Tucker, D., Dungan, J., & Sabol, V. (2014). Improving nurses'vasopressor titration skills and self-efficacy via simulation-based learning. *Clinical Simulation in Nursing*, *10*, e291-e299. http://dx.doi.org/10.1016/j.ecns.2014.02.002.

Friedman, M. I., Cooper, A. H., Click, E., & Fitzpatrick, J. J. (2011). Specialized new graduate RN critical care orientation: Retention and financial impact. *Nursing Economics*, *29*, 7-14.

Gantt, L. (2010). Using the Clark Simulation Evaluation Rubric with associate degree and baccalaureate nursing students. *Nursing Education Perspectives*, *31*, 101-105.

Hillman, L., & Foster, R. (2010). The impact of a nursing transitions programme on retention and cost savings. *Journal of Nursing Management*, *19*, 50-56.

Jeffries, P. R. (2012). *Simulation in nursing education: From conceptualization to evaluation* (2nd ed.). New York, NY: National League for Nursing.

Kameg, K., Clochesy, J., Mitchell, A. M., & Suresky, J. M. (2010). The impact of high fidelity simulation on self-efficacy of communication skills. *Issues in Mental Health Nursing*, *31*, 315-323. http://dx.doi.org/10.3109/01612840903420331.

Kardong-Edgren, S. (2013). A wake up call…with an objective structured clinical examination. *Clinical Simulation in Nursing*, *9*, e3-e4. http://dx.doi.org/10.1016/j.ecns.2012.11.002.

Kowalski, S., & Cross, C. I. (2010). Preliminary outcomes of a local residency programme for new graduate registered nurses. *Journal of Nursing Management*, *18*, 96-104. http://dx.doi.org/10.1111/j.1365-2834.2009.01056.x.

Liou, S., & Cheng, C. (2014). Developing and validating the clinical competence questionnaire: A self-assessment instrument for upcoming baccalaureate nursing graduates. *Journal of Nursing Education and Practice*, *4*, 56-66. http://dx.doi.org/10.5430/jnep.v4n2p56.

Marigliano, A., Barbadoro, P., D'Errico, M. M., & Prospero, E. (2012). Active training and surveillance: 2 good friends to reduce urinary catheterization. *American Journal of Infection Control*, *40*(8), 692-695.

McGaghie, W. C., Issenberg, S. B., Petrusa, E. R., & Scalese, R. J. (2010). A critical review of simulation based medical education research. *Medical Education*, *44*(1), 50-63.

McNelis, A. M., Jeffries, P. R., Hensel, D., & Anderson, M. (2009). Simulation: Integral to clinical education. In Ard, N., & Valiga, T. M. (Eds.), *Clinical nursing education: Current reflections*. New York, NY: National League for Nursing. (pp. 145-164).

Oetker-Black, S. L., Kreye, J., Davis, T., Underwood, S., & Naug, S. (2016). The psychometric evaluation of the revised clinical skills self-efficacy scale. *Journal of Nursing Measurement*, *24*(1), 166-175. http://dx.doi.org/10.1891/1061-3749.24.1.166.

Olejniczak, E. A., Schmidt, N. A., & Brown, J. M. (2010). Simulation as an orientation strategy for new nursing graduates: An integrative review of the evidence. *Simulation in Healthcare*, *5*, 52-57.

Robb, M. (2012). Self-efficacy with application to nursing education: A concept analysis. *Nursing Forum*, *47*, 166-172.

Rudolph, J. W., Simon, R., & Raemer, D. B. (2007). Which reality matters? Questions on the path to high engagement in healthcare simulation. *Simulation in Healthcare*, *2*(3), 161-163.

Roh, Y. S. (2014). Effects of high-fidelity patient simulation on nursing students' resuscitation-specific self-efficacy. *CIN: Computers, Informatics, Nursing*, *32*, 84-89. http://dx.doi.org/10.1097/CIN.000000000000034.

Ruth-Sahd, L. A. (2013). A call to action: Nursing education must embrace change and move forward. *Dimensions of Critical Care Nursing*, *33*, 28-33. http://dx.doi.org/10.1097/DCC.0000000000000020.

Shinnick, M. A., & Woo, M. A. (2014). Does nursing student self-efficacy correlate with knowledge when using patient simulation? *Clinical Simulation in Nursing*, *10,*(2), e71-e79. http://dx.doi.org/10.1016/j.ecns.2013.07.006.

Theisen, J. L., & Sandau, K. E. (2013). Competency of new graduate nurses: A review of their weaknesses and strategies for success. *The Journal of Continuing Education in Nursing*, *44*, 406-414. http://dx.doi.org/10.3928/00220124-20130617-38.

Tiffen, J., Graf, N., & Corbridge, S. (2009). Effectiveness of a low-fidelity simulation experience in building confidence among advanced practice nursing graduate students. *Clinical Simulation in Nursing*, *5*, e113-e117. http://dx.doi.org/10.1016/j.ecns.2009.01.009.

Todd, M., Manz, J. A., Hawkins, K. S., Parsons, M. E., & Hercinger, M. (2008). The development of a quantitative evaluation tool for simulations in nursing education. *International Journal of Nursing Education Scholarship*, *5*, 1-17, Retrieved from http://www.bepress.com/ijnes/vol5/iss1/art41/

UHC/AACN. (2014). *UHC/AACN Nurse Residency Program*. Retrieved from http://www.aacn.nche.edu/education-resources/nurse-residency-program

Vaesen, K. (2012). The cognitive bases of human tool use. *Behavioral and Brain Sciences*, *35*, 203-262. http://dx.doi.org/10.1017/S0140525X11001452.

Wilhaus, J., Burleson, G., Palaganas, J., & Jeffries, P. (2014). Authoring simulations for high stakes evaluation. *Clinical Simulation in Nursing*, *10*(4), e177-e182. http://dx.doi.org/10.1016/j.ecns.2013.11.006.

Wood, R., & Toronto, C. (2012). Measuring critical thinking dispositions of novice nursing students using human patient simulators. *Journal of Nursing Education*, *51*, 349-357.

Zigmont, J. J., Wade, A., Edwards, T., Hayes, K., Mitchell, J., & Oocumma, N. (2015). Utilization of experiential learning, and the learning outcomes model reduces RN orientation time by more than 35%. *Clinical Simulation in Nursing*, *11*(2), 79-94. http://dx.doi.org/10.1016/j.ecns.2014.11.001.