JNPD Journal for Nurses in Professional Development • Volume 39, Number 6, E190–E195 • Copyright © 2022 Wolters Kluwer Health, Inc. All rights reserved.

Implementation of an Evidence-Based Onboarding Program to Optimize Efficiency and Care Delivery in an Intensive Care Unit

Heather Pena, MSN, RN, CCRN-CSC ❍ Kelly Kester, DNP, RN, CCRN, NE-BC ❍
Allen Cadavero, PhD, RN, CCRN, WOCN ❍ Stacey O'Brien, MSN, RN

Nationally, nurse turnover is 18.7%, and 24.1% of nurses leave their organization within a year of hire. Onboarding is a key component of a nurse's intent to stay and job satisfaction. This article describes the implementation and results of an onboarding program in a large intensive care unit.

BACKGROUND

Nurse leaders (NLs), inclusive of unit and operational leaders and nursing professional development specialists, are challenged with complex clinical and operational priorities. Mitigating stressors of the turbulent nursing workforce is increasing in importance, as healthcare organizations strive to consistently deliver high-quality care, achieve strong patient outcomes, and remain financially stable. Knowing that national registered nurse (RN) turnover has reached 18.7% and 24.1% of RNs leave their job within a year of hire, identifying strategies to optimize retention of bedside RNs is crucial (NSI Nursing Solutions, Inc., 2021). High turnover leads not only to increased training needs but also to decreased retention of team knowledge, skill, and the experience needed to deliver high-quality patient care. In turn, it limits the ability for teams to train the next generation of RNs (Tang & Hudson, 2019). A significant opportunity to tackle aspects of RN turnover lays within the onboarding phase of employment (Pena et al., 2021).

Heather Pena, BSN, RN, CCRN-CSC, is Strategic Services Associate, Duke University Hospital, Durham, North Carolina.

Kelly Kester, DNP, RN, CCRN, NE-BC, is Clinical Operations Director, Duke University Hospital, Durham, North Carolina.

Allen Cadavero, PhD, RN, CCRN, WOCN, is Assistant Clinical Professor, Duke University School of Nursing, Durham, North Carolina.

Stacey O'Brien, MSN, RN, is Nursing Program Manager, Duke University Health System, Durham, North Carolina.

The authors have disclosed that they have no significant relationship with, or financial interest in, any commercial companies pertaining to this article.

ADDRESS FOR CORRESPONDENCE: Heather Pena, MSN, RN, CCRN-CSC, Duke University Hospital, Durham, NC (e-mail: heather.pena@duke.edu).

Supplemental digital content is available for this article. Direct URL citations appear in the printed text and are provided in the HTML and PDF versions of this article on the journal's Web site (www.jnpdonline.com).

DOI: 10.1097/NND.0000000000000915

Although the education and preparation of RNs leading to licensure is thorough, it is insufficient for the realities and responsibilities of the nursing profession (Myers et al., 2010). Newly licensed RNs, in particular, face increased stress and a need to learn clinical reasoning during the onboarding phase to ensure successful transition to practice (Powers et al., 2019). NLs must facilitate an onboarding program that consistently provides trained preceptors and evidence-based interventions. This will adequately and efficiently prepare newly hired RNs to clinically reason and deliver safe, effective patient care (Dickerson, 2017). Also, establishing a consistent time frame for orientation improves operational planning, as it allows NLs to plan for preceptor needs and predict when a newly hired RN will be prepared to care for patients independently (Kester et al., 2020). NLs must enhance operational planning and the overall value of onboarding while meeting individual learners' needs within a consistent time frame.

At a hospital in the southeastern United States, nursing teams faced several challenges related to onboarding newly hired RNs. First, inpatient departments' often on-boarded large numbers of RNs because of the availability of candidates in the region being tied to newly licensed RNs, who typically graduated in cohorts twice per year. Next, preceptor readiness was a challenge because of decreased levels of experience at the local level. Establishing consistent pathways to identify and prepare preceptors was difficult, despite the preceptor readiness tools available. Third, evidence-based practices for components of onboarding RNs existed but were not presented systematically to address long-term clinical and operational stability. Thus, the purpose of this article is to describe the implementation and 5-year outcomes of an evidence-based onboarding program and the relationship to RN turnover, work environment indicators, and nurse-sensitive quality indicators in a large cardiothoracic intensive care unit (CTICU).

METHODS

Implementing a standardized onboarding program requires continuous quality improvement principles to evaluate for effectiveness and untoward consequences. A workgroup

consisting of unit leaders in the CTICU, nursing professional development (NPD) specialists, and bedside RNs evaluated the program using plan-do-study-act cycles from 2015 to 2020. The onboarding process was evaluated and restructured into five distinct phases.

Phase 1: Planning

To adequately and consistently provide the necessary RN staffing levels, the CTICU leadership team practiced proactive staffing using the prospective staffing model (Kester et al., 2020). This model provided NLs with consistent decision-making practices regarding the volume and timing of RN hiring using historical turnover data. Operationally, the use of this model and consistent onboarding practices provided knowledge to accurately predict when an RN will be functional or able to care for patients independently (Kester et al., 2020). In addition, by performing a purposeful review of candidates' resumes and clinical exposure, NLs could select the most appropriate individuals to interview. Specific criteria was sought, particularly on newly licensed RNs' resumes, such as a preceptorship in an ICU. The goal was to identify candidates who matched the organization's values, who would be successful transitioning to practice, and who intended to stay employed in the CTICU for greater than 2 years. Behavioral interview questions and prehire job shadowing was also implemented to further help NLs identify ideal candidates to hire (Tatem et al., 2017). This proactive planning allowed NLs to accurately anticipate and prepare for the onboarding phase.

Ongoing evaluation for impact of revisions to the onboarding program occurred to ensure that no unintended effects were experienced. To measure trends within the work environment, the CTICU monitored results of the Magnet Self-Assessment of Organizational Culture, which evaluates seven categories measured via a 5-point Likert scale which is supportive of a Magnet culture. Nurse-sensitive indicators, including catheter-associated urinary tract infections (CAUTIs), central line-associated blood stream infections (CLABSIs), hospital-acquired pressure injuries, and patient falls, were also monitored. Lastly, RN turnover compared to the national average for critical care turnover and internal benchmarks was evaluated annually.

Phase 2: Orientation Standardization

Organizational review of the onboarding process discovered variability in orientation length and criteria for successful transition to practice throughout the hospital's ICUs. To better support the preceptors and new hires, objective criteria were developed to evaluate successful progression and completion of orientation using a constructivism approach. Constructivism is based on the work by Jean Piaget, who theorized that learners interpret what is presented to them using preexisting knowledge and ways of perceiving and acting (Byrnes, 2001). Fundamental to the principles of constructivism is Piaget's belief that knowledge is not the ability to memorize facts but instead the ability to develop a broader understanding of the material presented (Kurt, 2021; Piaget, 1973). In nursing, we must connect didactic knowledge to clinical care experiences that transcend beyond *knowing* into actually *doing*, which will advance students' abilities to develop a sense of salience (Benner et al., 2010; Penn, 2008). The use of a constructivist theory provides continuity and coherence in learning that extends through transition to practice (Benner et al., 2010).

Experiential competency-based skills component

A standardized orientation plan with objective criteria was created using tenants of constructivism, establishing progressive weekly milestones for NLs, preceptors, and new hires to understand expectations for success during orientation. A consistent length of orientation was implemented within the ICUs; newly licensed RNs were allotted 12 weeks, and experienced RNs were allotted 8 weeks. The first week of orientation was a 5-day centralized, hospital-based program, focused on electronic health record, life support, and other regulatory training needs. The first 2 weeks on the unit each consisted of five 8-hour shifts. Studies have demonstrated that 12-hour shifts can place individuals at higher risk for sleep deprivation, which can decrease an individual's ability to retain information (Caruso, 2014; Thompson, 2019). Allowing for more frequent, shorter shifts in the first 2 weeks enhanced the newly hired RNs' abilities to learn unit routines.

To facilitate regular feedback throughout orientation, weekly self- and preceptor evaluations were used to generate discussions about learners' successes and opportunities. NLs met with each new hire and preceptor biweekly, at minimum, to determine if milestones were met. If milestones were not met, unit NLs collaborated with the NPD specialists to create learning improvement plans to assist with remediation. As suggested by Elmers (2010), NPD specialists routinely rounded on new hires and preceptors to seek feedback regarding strengths and opportunities. The partnership with NPD specialists further supported the onboarding program and ability of new hires to successfully complete orientation.

Phase 3: Didactic Components

Onboarding into ICUs requires additional resources that support clinical thinking, particularly for the newly licensed RN (Powers et al., 2019). Moreover, cardiothoracic surgery is a specialized field that is not a common component of traditional RN training programs. To enhance support of new hires in the CTICU, five core classes were created covering a range of material to promote effective onboarding such as advanced hemodynamics (see Supplemental Digital Content 1, http://links.lww.com/JNPD/A60). Didactic education is needed to allow time outside the stressful clinical setting for the new hire to process new concepts. However,

adult learners are unique in that most adult learners do not retain material unless reviewed numerous times (Hermsen et al., 2019). Traditional methods of lecture only simply do not result in adequate learning, particularly for adult learners. Simulation and case studies have demonstrated to improve learner retention on the subject matter (Hermsen et al., 2019; Montenery, 2017). Therefore, each class employed multiple learning modalities including lecture, case scenarios, and hands-on simulation to enhance learning.

Phase 4: Preceptors and Teaching Styles

The relationship between a preceptor and orientee has a large impact on RN turnover, and fostering positive experiences for both preceptors and new hires is critical (Poradzisz et al., 2012; Sorrentino, 2013). Learning styles (LSs) and personality characteristics influence the success of learning (Dickerson, 2017; Elmers, 2010; Willemsen-McBride, 2010). Our team implemented the use of an LS assessment to pair the new hires and preceptors (Pena et al., 2021). Each preceptor and new hire completed the LS assessment electronically. Results of their assessment were used to pair the preceptor and new hire based on their primary LS. This purposeful matching of new hires and preceptors helped to promote consistency in the orientation experience and better learning for the new hire (Pena et al., 2021).

Phase 5: Preceptor Development

Being responsible for training RNs at the bedside is a challenge due to the many roles the preceptor must assume such as educating the orientee, evaluating progression, and providing feedback, all while providing direct patient care (Elmers, 2010). RNs require targeted education to understand their responsibilities as a preceptor, develop their teaching skills, evaluate and teach to specific LSs, and deliver feedback (Figueroa et al., 2013). To evaluate for areas of opportunity, unit preceptors completed a satisfaction survey in July 2016 developed by an NPD specialist. The survey consisted of Likert scale and open-ended questions. Of the 68 preceptors, 38 (55.8%) responded to the survey. Common themes included more clarity on responsibilities of the preceptor, providing feedback, and how to develop critical thinking. A focus group composed of preceptors, unit NLs, and NPD specialists discussed the need for preceptor development and, using the themes identified, defined an approach to support preceptor needs.

To formulate multimodal teaching strategies that promoted adult learning principles, tools and education were developed by the focus group. First, a preceptor manual was created to promote consistency in content taught to new hires. Next, a 4-hour unit-based class was created to teach the roles and responsibilities of the preceptor, effective methods for delivering feedback, and how to develop critical thinking. Lastly, the "married state" preceptorship model was reviewed, which is a strategy to ensure that the preceptor is always available to the new hire supporting quality of care and patient and RN safety (Figueroa et al., 2013).

RESULTS

At baseline (2014), the CTICU RNs (n = 132) had a mean age of 34 years (SD = 8.88), were predominantly female (79.5%), and had a BSN or MSN (78.0%; see Table 1). Also, 42.4% of RNs were within their first year of hire, and 37.9% had less than 2 years of RN experience. The mean years of experience was 2.8 years (median = 1.5, range: 0–27, 4.4). Following the intervention (2020), the CTICU RNs (n = 247) had a mean age of 30 years (SD = 7.6), were predominately female (74.5%), and had a BSN or MSN (86.6%). The CTICU had 32% of RNs within their first year of hire, and 45.7% had less than 2 years of experience. The mean years of experience was 3.17 (median = 1.9, range: 0–31.1, SD = 4.07). There was no statistical difference between the two cohorts.

Turnover prior to implementation was 40.6%. After implementation, a 17.1% reduction in turnover was observed between 2015 and 2017. Turnover then stabilized relative to our internal target and was compared to the ICU national average of 17.62% (range: 16.4–18.7, SD = 0.90) over the next 3 years (see Figure 1; NSI Nursing Solutions, Inc., 2021). Length of orientation was variable for both experienced and newly licensed RNs (range: 27–112 days). The standardization of orientation length resulted in a consistent

TABLE 1 Demographics of Registered Nurses Pre- and Post-Intervention

Characteristic	Pre-Intervention (2014) (n = 132)	Post-Intervention (2020) (n = 247)
Age, years		
Mean (SD)	34 (8.88)	30 (7.6)
Median	29	27
Gender		
Male	27 (20.5%)	63 (26.7%)
Female	105 (79.5%)	184 (74.5%)
Level of education		
BSN or MSN	104 (78.0%)	214 (86.6%)
ADN or diploma	28 (22.0%)	33 (13.4%)
Experience		
Within first year of hire	56 (42.4%)	79 (32%)
<2 years of RN experience	50 (37.9%)	113 (45.7%)

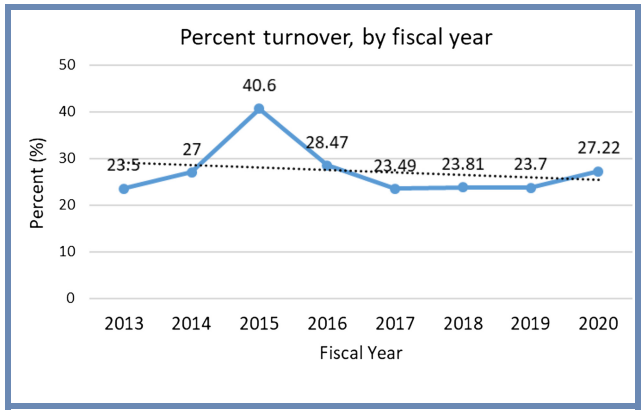

FIGURE 1. Percent turnover, by year. This figure is available in color online (www.jnpdonline.com).

duration for both newly licensed RNs and experienced RNs at 84 and 56 days, respectively. Consistency in preceptor/new hire dyads and satisfaction with orientation improved (Pena et al., 2021).

Work environment, as assessed using The Magnet Self-Assessment of Organizational Culture results, improved between 2015 and 2019 for the domains Adequacy of Staffing and Resources, Professional Development, and Interprofessional Relationships (see Figure 2). The domains of Fundamentals of Quality Nursing Care Overall, Autonomy, and RN-to-RN Teamwork and Collaboration declined (see Figure 2). Several nurse-sensitive indicators were measured during the implementation of this study including falls, pressure injuries, CLABSIs, and CAUTIs. Falls, pressure injuries, and CLABSIs all demonstrated a downward trend, and CAUTIs remained stable throughout the intervention period, despite a shorter orientation length (see Figure 3).

DISCUSSION

Despite the CTICU RN cohorts decreasing in experience, prescribing orientation lengths based on experience had no adverse or unintended effects on patients or RNs. The Magnet Self-Assessment of Organizational Culture results reflect an improved work environment, nurse-sensitive indicators remained stable or improved, and RN turnover decreased. Consistency in the onboarding process may better prepare NLs to make proactive hiring decisions to fulfill unit-based staffing models, which is supportive of improved work environment and RN retention.

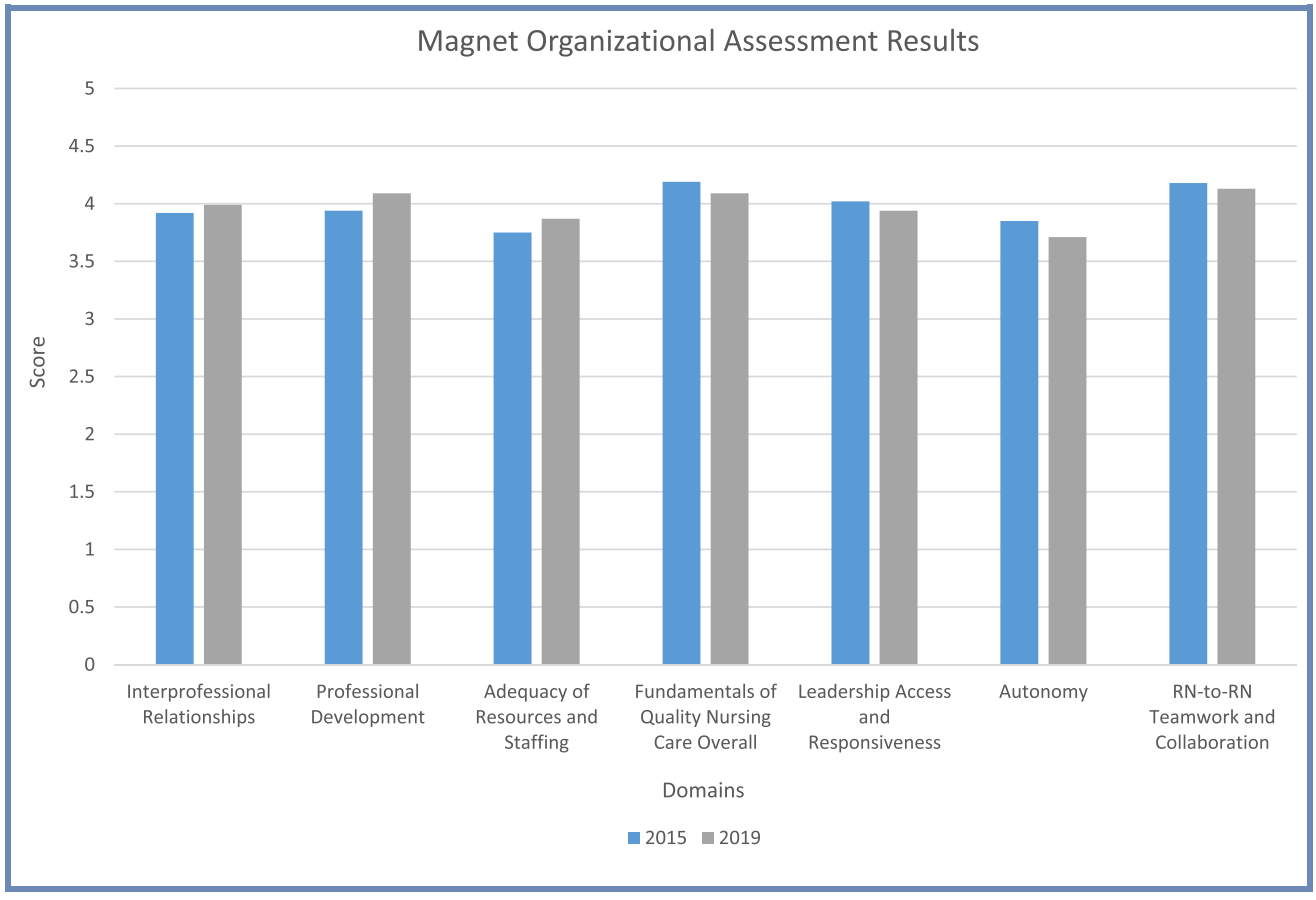

FIGURE 2. Magnet self-assessment organizational work culture results. This figure is available in color online (www.jnpdonline.com).

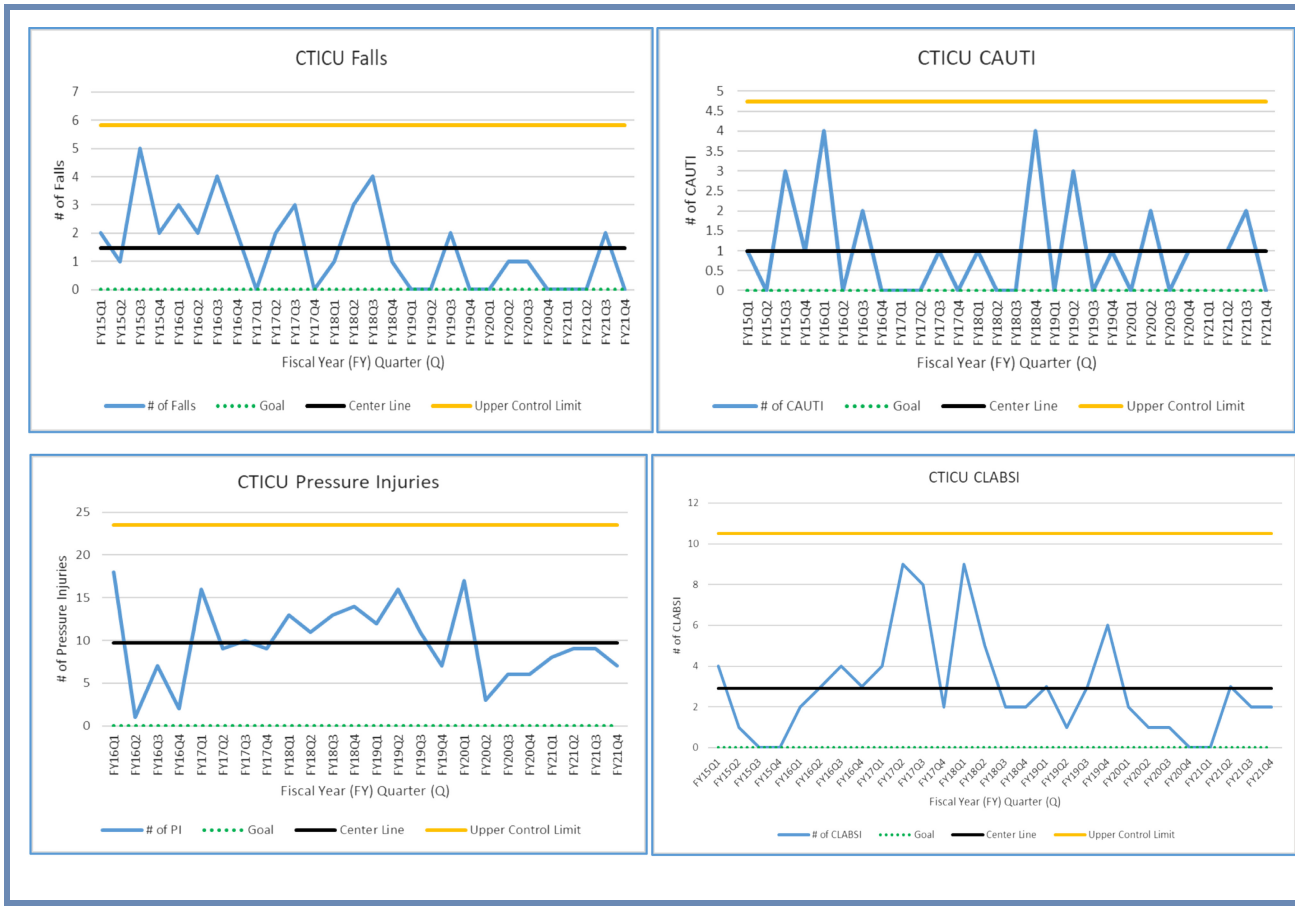

FIGURE 3. Nurse-sensitive quality indicators. This figure is available in color online (www.jnpdonline.com).

This work contributes evidence that a standardized approach to onboarding RNs to an ICU may be effective in meeting operational and clinical goals (Kester et al., 2020). For example, similar to other authors, these results demonstrate that a lengthy orientation with excessive didactic components may not be needed to improve RN retention or clinical care delivery. These operational and clinical goals were, in the present study, safely and effectively achieved despite shorter orientation time. By selecting ideal candidates, enhancing the content to support orientation, and preparing preceptors, orientation was a consistent and efficient process that resulted in each new hire having a positive onboarding experience. In addition, NLs can be more effective in delivering feedback to encourage new hires and correct issues real time (Tang & Hudson, 2019). It also allows for rapid improvement when new evidence or best practices emerge.

Onboarding positively affects the satisfaction and retention of the newly hired RN (Shinners & Franqueiro, 2015; Tomietto et al., 2014). The organization had a nurse residency program in place prior to this intervention, and it was not modified during the study period. Using consistent, evidence-based approaches to facilitate an effective onboarding program may help NLs improve operational planning, which, in turn, leads to an improved work environment and staff engagement. Given the high levels of RN turnover across the United States, nursing departments must invest in establishing a stable onboarding program to fulfill the needs of the organization, nursing team, and future hires.

LIMITATIONS

This study has several limitations. First, the orientation documents, although created through sound educational theories, were not validated prior to use. Second, although the subcategories of the Magnet survey remained the same in 2015 and 2019, the questions in the survey changed, which could lead to different responses and scores. Third, although LS were accounted for, intergenerational differences were not accounted for, which could lead to ineffective preceptor/new hire dyads (Quek & Shorey, 2018). Lastly, an increase in turnover was seen in fiscal year 2020 because of challenges related to the COVID-19 pandemic, including lucrative travel contracts and lack of clinical sites for RN students, leading to decreased baseline RN skills.

CONCLUSION AND RECOMMENDATIONS

This study demonstrates the value of shorter orientation terms and the need to further evaluate the benefit of consistent orientation practices, including time spent in bedside learning and didactic learning. Furthermore, consistent orientation tools and documents should be validated and disseminated. Creating and sustaining a structured onboarding program is a long journey that requires planning a multiprong approach and dedicated leaders and staff. As outlined in the literature, enhanced onboarding and orientation is a critical component of patient and staff safety and satisfaction, and strategies to implement strong onboarding and orientation programs are critical for NLs.

References

Benner, P., Sutphen, M., Leonard, V., & Day, L. (2010). *Educating nurses a call for radical transformation*. Jossey-Bass.

Byrnes, J. (2001). *Cognitive development and learning in instructional contexts*. Allyn & Bacon.

Caruso, C. C. (2014). Negative impacts of shiftwork and long work hours. *Rehabilitation Nursing*, *39*(1), 16–25. 10.1002/rnj.107

Dickerson, P. S. (Ed.). (2017). *Core curriculum for nursing professional development* (5th ed.). Association for Nursing Professional Development.

Elmers, C. R. (2010). The role of preceptor and nurse leader in developing intensive care unit competency. *Critical Care Nursing Quarterly*, *33*(1), 10–18. 10.1097/CNQ.0b013e3181c8e0a9

Figueroa, S., Bulos, M., Forges, E., & Judkins-Cohn, T. (2013). Stabilizing and retaining a quality Nursing work force through the use of the married state preceptorship model. *Journal of Continuing Education in Nursing*, *44*(8), 365–357. 10.3928/00220124-20130603-08

Hermsen, J. L., Mokadam, N. A., & Verrier, E. D. (2019). Flipping the classroom: How to optimize learning in the didactic setting. *Thoracic Surgery Clinics*, *29*(3), 279–284. 10.1016/j.thorsurg.2019.04.002

Kester, K. M., Lindsay, M., & Granger, B. (2020). Development and evaluation of a prospective staffing model to improve retention. *Journal of Nursing Management*, *28*, 425–432. 10.1111/jonm.12945

Kurt, S. (2021, February 21). *Constructivist learning theory*. Educational Technology. https://educationaltechnology.net/constructivist-learning-theory/

Montenery, S. (2017). Problem-based learning for didactic presentation to baccalaureate nursing students. *Creative Nursing*, *23*(2), 102–111. 10.1891/1078-4535.23.2.102

Myers, S., Reidy, P., French, B., McHale, J., Chisholm, M., & Griffin, M. (2010). Safety concerns of hospital-based new-to-practice registered nurses and their preceptors. *Journal of Continuing Education in Nursing*, *41*(4), 163–171. 10.3928/00220124-20100326-02

NSI Nursing Solutions, Inc. (2021). *2021 NSI national health care retention & RN staffing report*. https://www.nsinursingsolutions.com/Documents/Library/NSI_National_Health_Care_Retention_Report.pdf

Pena, H., Kester, K., & O'Brien, S. (2021). Using learning style assessments to effectively match preceptors and orientees. *Journal for Nurses in Professional Development*, *37*(1), 12–17. 10.1097/NND.0000000000000697

Piaget, J. (1973). *To understand is to invent*. Grossman.

Poradzisz, M., Kostovich, C. T., O'Connell, D. O., & Lefaiver, C. A. (2012). Preceptors and new graduate nurse orientees: Implications of psychological type compatibility. *Journal for Nurses in Staff Development*, *28*(3), E9–E15. 10.1097/NND.0b013e31825515ec

Powers, K., Herron, E. K., & Pagel, J. (2019). Nurse preceptor role in new graduate nurses' transition to practice. *Dimensions of Critical Care Nursing*, *38*(3), 131–136. 10.1097/DCC.0000000000000354

Quek, G. J. H., & Shorey, S. (2018). Perceptions, experiences, and needs of nursing preceptors and their preceptees on preceptorship: An integrative review. *Journal of Professional Nursing: Official Journal of the American Association of Colleges of Nursing*, *34*(5), 417–428. 10.1016/j.profnurs.2018.05.003

Shinners, J. S., & Franqueiro, T. (2015). Preceptor skills and characteristics: Considerations for preceptor education. *Journal of Continuing Education in Nursing*, *46*(5), 233–236. 10.3928/00220124-20150420-04

Sorrentino, P. (2013). Preceptor: Blueprint for successful orientation outcomes. *Journal of Emergency Nursing*, *39*(5), e83–e90. 10.1016/j.jen.2012.05.029

Tang, J. H., & Hudson, P. (2019). Evidence-based practice guideline: Nurse retention for nurse managers. *Journal of Gerontological Nursing*, *45*(11), 11–19. 10.3928/00989134-20191011-03

Tatem, G., Kokas, M., Smith, C. L., & DiGiovine, B. (2017). A feasibility assessment of behavioral-based interviewing to improve candidate selection for a pulmonary and critical care medicine fellowship program. *Annals of American Thoracic Society*, *14*(4), 576–583. 10.1513/AnnalsATS.201611-940OC

Thompson, B. J. (2019). Does work-induced fatigue accumulate across three compressed 12 hour shifts in hospital nurses and aides?*PLOS ONE*, *14*(2), e0211715. 10.1371/journal.pone.0211715

Tomietto, M., Rappogliosi, C. M., Sartori, R., & Battistelli, A. (2014). La socializzazione organizzativa nei primi tre anni di professione infermieristica: strategie per ridurre l'intenzione di turnover [Organizational socialization in the first three years of nursing profession: Strategies to decrease turnover intention]. *Professioni Infermieristiche*, *67*(4), 195–202. 10.7429/pi.2014.674195

Willemsen-McBride, T. (2010). Preceptorship planning is essential to perioperative nursing retention: Matching teaching and learning styles. *Canadian Operating Room Nursing Journal*, *28*(1), 8.