Available online at www.sciencedirect.com

ScienceDirect

Nurs Outlook 67 (2019) 345–353

Nursing Outlook

www.nursingoutlook.org

Advancing the clinical nurse leader model through academic-practice-policy partnership

Miriam Bender, PhD, RN, CNL[a,*], Patricia Baker, MSN, RN-BC, CNL, ANOD[b], James L. Harris, PhD, APRN-BC, MBA, CNL, FAAN[c], Lisle Hites, MS, Med, PhD[d], Robert J. LaPointe, MSN, RN, CNL, CCRN[e], Elizabeth A. Murphy, BSN, MSBA, RN, NEA-BC, FACHE[f], Linda Roussel, PhD, RN, FAAN, NEA-BC, CNL[g], LeeAnna Spiva, PhD, RN[h], Joan M. Stanley, PhD, CRNP, FAAN, FAANP[i], Patricia L. Thomas, PhD, RN, FACHE, NEA-BC, ACNS-BC, CNL[j], Marjory Williams, PhD, RN, NEA-BC[k]

[a]Sue & Bill Gross School of Nursing, University of California, Irvine, CA
[b]UT Health School of Nursing, San Antonio, TX
[c]University of South Alabama, Mobile, AL
[d]Department of Health Care Organization and Policy, The University of Alabama at Birmingham, Birmingham, AL
[e]Corporal Michael J Crescenz VA Medical Center, Philadelphia, PA
[f]Mercy Health Saint Mary's, a member of Trinity Health, Grand Rapids, MI
[g]Texas Woman's University, Denton, TX
[h]WellStar health System, Marietta, Georgia
[i]American Association of Colleges of Nursing, Washington, DC
[j]Kirkhoff College of Nursing, Cook-DeVos Center for Health Sciences, Grand Rapids, MI
[k]Central Texas Veterans Health Care System, Temple, TX

ARTICLE INFO

Article history:
Received 29 August 2018
Received in revised form
12 February 2019
Accepted 12 February 2019
Available online February 16, 2019.

Keywords:
Clinical nurse leader
Participatory approach
Nursing care model

ABSTRACT

The nursing profession is tasked with identifying and evaluating models of care with potential to add value to health care delivery. In consideration of this goal, we describe the Clinical Nurse Leader (CNL) initiative and the activities of a national-level CNL research collaborative. The CNL initiative, launched by the American Association of Colleges of Nursing in collaboration with education and healthcare leaders, has delineated CNL education curriculum and practice competencies, and fostered the creation of academic-practice-policy partnerships to pilot CNL integration into frontline nursing care delivery. The partnership has evolved into an Agency for Healthcare Research and Quality affiliate practice-based research network, the CNL Research Collaborative, which links research, policy, education, and practice stakeholders to advance the CNL evidence base. We summarize foundational CNLRC research to explain CNL

Disclosures: All authors declare no competing interests. This work was supported in part by resources at the Central Texas Health Veterans Care System. Content is not intended to represent the views of the Department of Veterans Affairs or the United States Government.

* *Corresponding author:* Miriam Bender Sue & Bill Gross School of Nursing, University of California, Irvine, 252 Berk Hall, Irvine, CA 92697-3959.
E-mail address: miriamb@uci.edu (M. Bender).

https://doi.org/10.1016/j.outlook.2019.02.007

Evidence based nursing

practice, quantify CNL effectiveness, and bring clarity to how CNLs can be implemented to consistently influence care, quality, and safety.

Cite this article: Bender, M., Baker, P., Harris, J.L., Hites, L., LaPointe, R.J., Murphy, E.A., Roussel, L., Spiva, L., Stanley, J.M., Thomas, P.L., & Williams, M. (2019, July/August). Advancing the clinical nurse leader model through academic-practice-policy partnership. Nurs Outlook, 67(4), 345–353. https://doi.org/10.1016/j.outlook.2019.02.007.

Introduction

The Institute of Medicine (IOM) report titled "To Err is Human," almost two decades ago, informed the nation that healthcare delivery was "floundering" in its ability to provide consistently high-quality care to all Americans (IOM, 2001). In 2011, the IOM recommended that the nursing profession lead the way in developing and implementing innovative nursing models of care that can consistently add value to the health care system if widely implemented (IOM, 2011). Numerous studies provide substantial evidence that increasing Registered Nurse (RN) hospital staffing reduces the incidence of avoidable adverse events that lead to avoidable patient harm or even death (Needleman, 2017). What remains less clear is how to organize RNs into care delivery models that consistently result in high quality safe care (Bender & Feldman, 2015; Butler et al., 2011; Kitson, Muntlin Athlin, & Conroy, 2014). This is a critical knowledge gap that must be addressed.

The Clinical Nurse Leader (CNL) initiative was developed in direct response to the challenges articulated in the IOM reports. In 1999, the American Association of Colleges of Nursing (AACN) initiated a series of task forces to examine what the 'nurse of the future' could be in terms of updated educational competencies, and discuss how these competencies could be integrated into redesigned nursing models of care to directly and positively influence healthcare delivery (Stanley, Hoiting, Burton, Harris, & Norman, 2007). This work led to the development of the CNL masters-level education curriculum, with five program models (e.g. postbachelor, entry-level, postmaster certificate, etc.), that includes end-of-program competencies and recommendations for practice integration. The purpose of this article is to describe the evolution of the CNL initiative and provide a comprehensive review of the research conducted by the national-level CNL Research Collaborative (CNLRC) to advance the CNL evidence base.

History of the CNL Academic-practice-policy Task Forces

In 1999, the AACN convened the first of three task forces comprised of nurses, educators, and healthcare professionals to discuss how nurses could be better educated and mobilized to meet the changing needs of the healthcare landscape (Stanley et al., 2007). The task force was charged with examining issues and trends for new education and licensure models and recommendations for future action (Tornabeni, 2006). The results were presented to the AACN membership in 2002. The taskforce ultimately recommended redesigning nurse education models to better prepare nurses to function within and help lead the redesign the healthcare environment (Long, 2004; Stanley et al., 2007). A second task force was then established and charged with articulating basic nursing competencies necessary for providing high quality care in a redesigned healthcare landscape. Healthcare practice leaders with a history of nursing care innovation were invited to participate and help design the nursing 'competencies of the future' (Drenkard, 2004; Drenkard & Cohen, 2004; Sherman, Clark, & Maloney, 2008). All participants were asked to envision the ideal nurse of the future and what their activities and responsibilities would entail (Long, 2004; Tornabeni & Miller, 2008). One realization was that whichever model was decided upon, it would necessitate unprecedented practice-academic collaboration. Practice settings would need to be redesigned so that the nurse of the future could become a part of the new delivery system and existing education curricula would need to change drastically to prepare these new nurses to practice effectively. These models would need to be piloted and evaluated before they could be considered the new standard of education and practice. The second task force resulted in the first working paper on the CNL role, and a commitment from the AACN to provide leadership in facilitating the new academic-practice partnerships necessary to pilot and evaluate the CNL model (Tornabeni & Miller, 2008).

A third taskforce, the CNL Implementation Task Force, was established in 2004 and charged with overseeing the evaluation of the first CNL implementation education-to-practice partnerships (Stanley et al., 2007; Tornabeni & Miller, 2008). The participants included equal representation from practice and education leaders. The American Organization of Nurse Executives became a key stakeholder as the CNL role aligned well with their guiding principles for the redesign of patient care delivery and the nurse's position within that model (Haase-Herrick & Herrin, 2007). The CNL Implementation Task Force developed the curriculum framework and end-of-program competencies for CNL education, as well as a standardized evaluation framework for CNL pilot implementations (Bartels, 2005; Harris, Walters, Quinn, Stanley, & McGuinn, 2006).

Outcomes of Task Force Partnerships

Seventy-nine schools of nursing and 136 practice sites were involved in the first phase of the pilot CNL education and practice implementation (Tornabeni, 2006). The CNL Implementation Task Force produced a number of significant outcomes, including the CNL curricular framework and end-of-program CNL competencies in the AACN CNL White paper (2007), CNL preceptor guidelines, a CNL Performance Assessment Tool, and a CNL Implementation Toolkit (Stanley et al., 2007). The 2007 AACN CNL White Paper represented the culmination of learning that had co-occurred between academic, practice, policy leaders over the course of the three task forces. The authors of the white paper agreed that the CNL must be educated at the master's level. To that end, the curriculum was developed in line with the following CNL end-of-program competencies: (a) nursing leadership, (b) care environment management, and (c) clinical outcomes management. The CNL would use these competencies at the microsystem front line of care to accomplish 15 essentials of care, including knowledge management, evidence based practice, team coordination, and lateral integration of care (AACN, 2007).

In a literature review describing published reports from 13 health systems that piloted the CNL role as part of the task force, it was noted that the context of implementation and CNL practice varied widely across settings (Bender, 2014). All reports described improved quality and safety outcomes, although metrics varied widely and did not lend themselves to comparison across pilot sites. However, qualitative data collected during the CNL pilots in one study highlighted the enthusiasm practice leaders expressed when participating in the CNL pilot, both in coleading the task force planning and implementation phases and in witnessing the results (Sherman, 2008).

Identified Barriers to CNL Adoption

Despite these advances, questions remained about CNL practice and its integration into health care delivery. As a report in the *American Journal of Nursing* stated: "Although some leaders, organizations, and institutions have enthusiastically accepted the CNL, others remain unconvinced" (Nelson, 2010, p. 22). Ongoing concerns included role overlap, mostly with the Clinical Nurse Specialist (CNS) role, and the lack of rigorous scientific data on CNL practice effectiveness (Bender, 2014). In response, articles were written to delineate CNL practice from other roles such as the CNS and the case manager (Foster et al., 2011; Stachowiak & Bugel, 2013; Thompson & Lulham, 2007). There remained confusion about the defining of CNL. This lack of CNL practice clarity limited the ability to clearly articulate or measure CNL practice, and to link this practice specifically to quality and safety outcomes (Bender, 2014; 2017).

The Clinical Nurse Leader Research Collaborative

The annual AACN CNL Summit has become the premiere setting for knowledge dissemination about CNL education, research, and practice. Through this venue, academic, clinical, and research scholars began concerted efforts to reduce identified CNL knowledge gaps. This group has now formalized into the CNLRC. The CNLRC is an Agency for Healthcare Research and Quality affiliate practice based research network (https://pbrn.ahrq.gov/pbrn-registry/clinical-nurse-leader-research-collaborative). The CNLRC aims (a) to explain CNL practice, (b) to quantify CNL effectiveness, and (c) to bring clarity about how CNLs can be implemented to consistently influence care quality and safety (Williams & Bender, 2015). The CNLRC includes health service researchers, practicing CNLs, CNL educators, leaders of health systems integrating CNLs into their nursing models of care, and policy leaders. Currently, CNLRC board members represent regional and national health systems across the nation ($n = 6$), universities with CNL education programs or CNL research hubs ($n = 4$), and the AACN. The CNLRC is accomplishing its mission and vision through a participatory approach that captures and leverages experience and expertise from diverse practice, education, policy, and research perspectives at all phases of inquiry-to-dissemination (Bender et al., 2019). Collaborators include educators, active CNLs, and health system leaders that have connected with the CNLRC via outreach and through CNLRC participation in the annual AACN CNL Summit.

By pooling knowledge and questions, a consensus framework has emerged that prioritizes CNL knowledge generation needs (see Figure 1). The CNLRC used the empirically validated CNL Practice Model to categorize elicited questions based on where they fit in the CNL pathway. While there is an increasing knowledge being generated about CNL practice, in terms of domain 'readiness for CNL integrated care delivery', much less is known about how responsive CNL curricula are related to changes in CNL practices, which are themselves a response to emerging clinical and organizational needs. Another elicited question was more structural in nature, regarding what roles CNLs are filling in healthcare systems when they are not moving into formally designated CNL-integrated nursing care delivery models. The following sections showcase some of the research the CNLRC conducted to answer questions articulated in Figure 1.

Describing CNL Practice in the United States

A necessary first step was to determine where, to what extent, and by whom the initial vision of CNL practice was being achieved, through a descriptive study to ascertain certified CNL demographics,

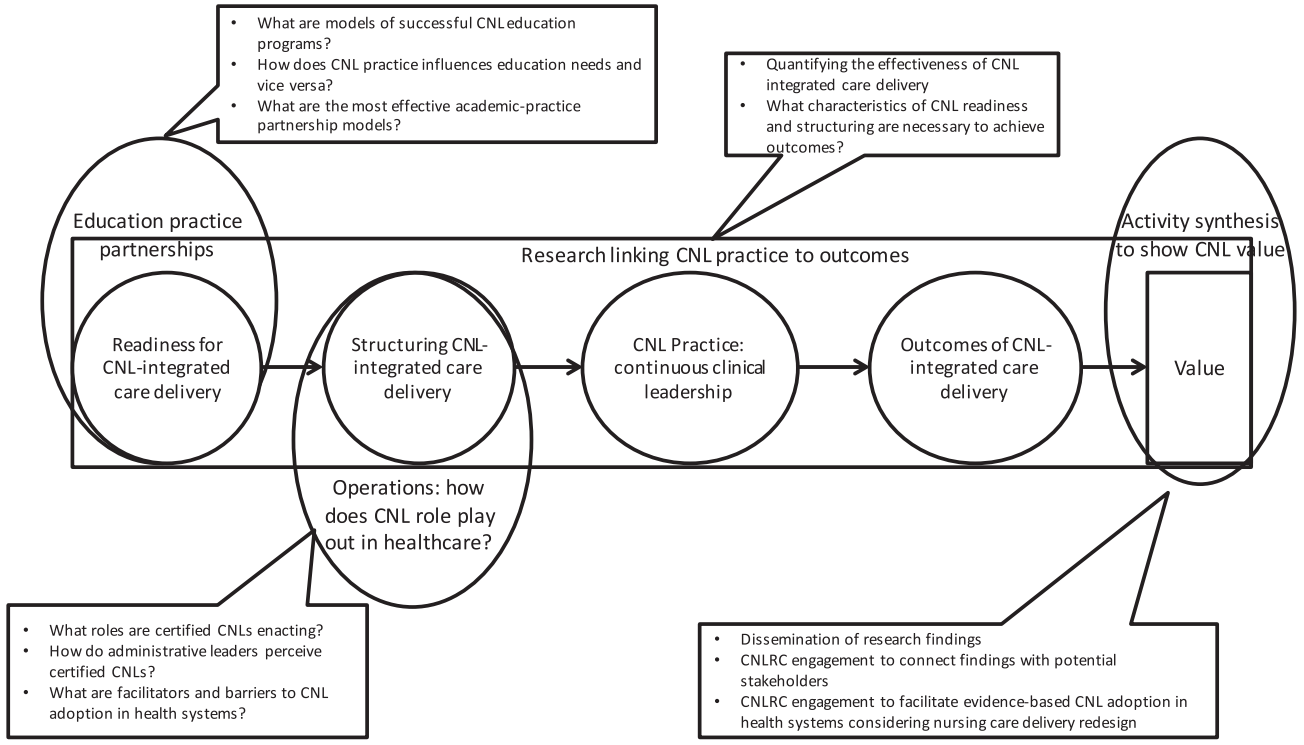

Figure 1 – The CNLRC's pragmatic CNL knowledge generation framework.

practice settings, and role enactment across the United States. A survey was developed and administered to a nationwide sample of over 1,000 certified CNLs, plus managers, leaders, educators, clinicians, and change agents involved in planning or integrating CNLs into a health system's nursing care delivery model (Bender, Williams, & Su, 2016a). The certified CNL response rate to the survey was 19%, and showed that 60% have greater than 10 years of RN experience, and 75% have additional specialty certifications. Fifty-eight percent of certified CNLs reported practicing in a formal CNL role and reported a high degree of accountability for all nine AACN CNL essential competencies. In another study, a systematic literature review was conducted to identify roles enacted by certified CNLs not in formal CNL roles (Clavo, Bender & Harvath, 2018). Roles identified include: faculty, 62%; clinical management/executive, 12%; specialty clinician, 11%; and staff nurse, 9%. These CNLs were accomplishing activities such as expert commentary, research, and curriculum development/testing. This raises interesting questions for further inquiry about the dimensionality of CNL competencies, and how it might play out in formal CNL roles vs. CNLs in more traditional roles. Answers to these questions will also highlight their distinctiveness from other clinical roles such as the CNS.

CNL Education and Practice Integration

Since the task force pilot, schools offering CNL programs have increased from 79 to 91 across the nation, and there are currently an estimated 7,000 certified CNLs in the United States and Japan (https://www.aacnnursing.org/Portals/42/CNL/CNLStats.pdf). Numerous reports have been published describing academic initiatives to develop and implement curricula to educate students in emerging CNL masters programs, including both didactic and clinical immersion structures and processes (Fox, 2017; Gazaway, Anderson, Schumacher, & Alichnie, 2018; Gerard, Rn, Grossman, & Godfrey, 2012; Hicks & Rosenberg, 2016; Jukkala, Greenwood, Motes, & Block, 2013; Lammon, Stanton, & Blakney, 2010; Maag, Buccheri, Capella, & Jennings, 2006; McKeon et al., 2009; Moore, Schmidt, & Howington, 2014; Nance-Floyd & Zomorodi, 2018; Webb & McKeon, 2014; Wesolowski, Casey, Berry, & Gannon, 2014). A textbook, currently in its 3rd edition, provides practice based evidence and subject matter expertise to help both academic instructors and clinicians understand CNL competencies and how they can be implemented in practice (Harris, Roussel, & Thomas, 2018).

CNL Practice integration has become a focused topic of inquiry. For example, the VA, recognizing the need for guidance in relation to CNL integration into practice, launched a CNL Implementation & Evaluation Service in 2011. The service identified common areas for facilitation efforts, including developing CNL strategic plans, preparing environments for CNL practice, developing capacity to implement the CNL, and supporting the growth of CNL structures and processes in VAs across the nation (Williams, Avolio, Ott, & Miltner, 2016). One outcome of this effort was the development and pilot testing of a curriculum to facilitate CNL transition to practice (Kaack et al., 2018). The

curriculum was based on lessons learned from the CNL Implementation & Evaluation Service, and utilized Benner's novice-to-expert model and the validated CNL Practice Model to structure CNL practice development and integration, respectively. The CNL development model is a robust tool that can be applied to support consistent and effective CNL practice integration.

Explaining CNL Practice

Despite this encouraging growth in CNL education and adoption across the nation, one reason for the lack of robust evidence for CNL practice was the lack of a formal conceptualization of CNL practice. This limited the ability to explicitly link CNL practice to quantified improvements in quality and safety outcomes. To address this gap, a grounded theory analysis was conducted with existing CNL literature to clarify what CNL practice is and to guide the development of appropriate measurement tools (Bender, 2016a; 2016b). The analysis produced a preliminary CNL practice model that delineated CNL-specific activities and described factors related to organizational readiness for care delivery structure and implementation of CNL practice that are critical to outcomes including improved care environments and quality. The model was refined through a modified Delphi study with members of the CNLRC (Bender, Spiva, Su, & Hites, 2018). The original domains from the grounded theory study underwent significant revision to better reflect a multiprofessional understanding of readiness (readying the environment for CNLs), structuring (defining a CNL competency-based workflow), practice (continuous clinical leadership), and expected outcomes (improved care environments and care quality outcomes).

Through these analyses, the core phenomenon of CNL practice was conceptualized as continuous clinical leadership at the patient-health care interface. CNL continuous clinical leadership involves four core activities: facilitating effective ongoing communication, strengthening intra and interprofessional relationships, building and sustaining teams, and supporting frontline interdisciplinary clinical staff engagement in clinical quality improvement. The study also identified readiness and structuring elements that are considered necessary to enable the enactment of continuous clinical leadership practices by CNLs at the microsystem level. Organizational readiness includes acknowledgment of care delivery gaps by health system clinicians and leaders/managers, and subsequent consensus that CNL education and competencies have the potential to close these gaps. Organizational readiness is reflected by the development of an implementation strategy that is capable of preparing the clinical environment for change. Structuring elements include an appropriate administrative reporting structure for CNLs, as well as the clinical redesign of microsystem level care delivery to incorporate a consistent, competency-based CNL workflow.

Development of Tools to Measure CNL Practice and Outcomes

The CNLRC-led Delphi study also resulted in CNLRC-led development of a CNL Practice Survey that operationalized the refined CNL Practice Model (Bender, Avolio, et al., 2018). The refined model and survey instrument were empirically validated using structure equation modeling and confirmatory factor analysis, using data from the previously described national-level 2015 study (Bender, Williams, Su, & Hites, 2017). The model and survey instrument were further validated in a pattern matching case study at a regional health system comprising of four hospitals and an ambulatory clinic network that implemented CNLs into the majority of their care delivery units in 2010 (Bender, Spiva, et al., 2018). Structure equation modeling confirmed the CNL Practice Model's fit with the pattern matching case study data. Overall, the empirical findings supported the hypothesized relationship between CNL-integrated care delivery structure and CNL practice. In addition, the findings provided data supporting specific structuring characteristics, such as who a CNL reports to that can influence CNL practice, and thereby the individual's ability to achieve expected outcomes. The study also resulted in a validated survey instrument that is now being used to measure the effectiveness of CNL practice in health systems across the country.

The CNLRC is also focused on developing tools for measuring the outcomes of CNL-integrated care delivery. However, CNL-integrated care delivery is a complex healthcare intervention, proposed to facilitate a wide range of outcomes through numerous cross-disciplinary mechanisms of action. This makes linking CNL practice, even when it is able to be measured, with outcomes challenging from an internal validity perspective. Interrupted time series (ITS) design is a strong approach for measuring complex interventions, which measures change over time, and can account for potential study biases such as preintervention trends, seasonality and random fluctuation. This has been used successfully in the past to correlate CNL practice to quality outcomes (Bender, Connelly, Glaser, & Brown, 2012). However, traditional statistical methods do not model changes in outcome variation or correlation before and after interruption, and must assume a prespecified change point. CNLRC-driven research has resulted in the development of a 'robust' ITS model that overcomes these limitations, and is capable of estimating the change point in outcomes after an interruption (i.e. introduction of the intervention) and differences in both variation and correlations between outcomes both pre- and postinterruption (Cruz, Bender, & Ombao, 2017).

Measuring CNL Practice and Outcomes

Current efforts are focused on quantifying the effect of the CNL model on changes in nationally endorsed and standardized quality and safety outcomes. The 'robust' ITS modeling approach was used with patient satisfaction data (7 metrics in total) collected from a Michigan health system that integrated CNLs into their care model (Bender, Cruz, Murphy, Ombao, & Gillen, 2018). Results showed that the outcome change point differed across units. The intervention had an 'anticipatory' effect in some units, based on activities by CNL students before they graduated and took on the full CNL role accountabilities, yet took up to two months postformal implementation to have a change effect for other units. This suggests that some CNL students were making significant changes in their units from the start of their clinical immersion project. However, for unknown reasons based on the data from this study, the effort to instigate change for others took much longer. Quality outcomes improved significantly for the unit with the lowest scores pre-CNL, but not in other units. All unit's average pre-CNL estimate intercepts (for all seven measures) were 70 or above (on a 0–100 scale), suggesting that the hospital and CNL units were already 'high performers' before the nursing model redesign. This suggests that pre-CNL unit-level contextual factors such as existing levels of performance influence outcomes, with higher performing units showing perhaps less capacity for further improvement through CNL integration than lower performing units. This is a finding with implications on the selection of units that may benefit more or less from a redesign to integrate CNLs into the nursing model of care and comprises an important line of inquiry for future research.

However, a unique study finding, made possible with the 'robust' ITS modeling approach, was the significant decrease in variation in patient satisfaction scores for all outcomes at the hospital (55%–71%) and unit level (0%–55%). This means that the integration of CNLs into the health system's nursing care model resulted in improved and sustained consistency of care quality outcomes. To our knowledge, this is the first study quantifying improvements in consistency of outcomes after a systematic redesign of a frontline nursing model of care (Bender, Cruz, et al., 2018). Consistent outcomes are arguably as critical to quality as overall outcome improvement, because consistency in achieving outcomes month after month imply processes that can mitigate the inevitable contingencies that arise in practice. The results suggest CNLs are associated with stable clinical microsystem practices that help to reduce clinical variability, thus improving care quality. The study is currently being replicated in four other health systems across the nation to determine the generalizability of quality improvement findings. Further advances in the ITS modeling approach have also been completed, to assist with power analysis and meta-analysis design considerations. This allows possible multiunit analyses for outcomes in units with similar patient populations to determine the overall effect size for each outcome (Cruz, Gillen, Bender, & Ombao, 2019).

Evidence-based CNL Implementation

While quantification of the CNL care model effectiveness remains paramount, a recent systematic review of the CNL literature concluded that the context of CNL implementation in both the AACN task force case studies, and other more recent reports, showed wide variability in terms of how the CNL model was structured in clinical units and CNLs held accountabilities (Bender, 2014). A recent study aimed to identify organizational and implementation factors influencing perceived success of CNL initiatives across the country (Bender, Williams, Su, & Hites, 2016b). Through generalized linear modeling, the study identified five factors associated with perceived CNL success: phase of the CNL initiative in the organization, CNL practice consistency, CNL instructor or preceptor involvement, CNL reporting structure, and CNL setting ownership status. Participants in early phase CNL initiatives reported significantly lower success scores than those in more mature phases ($B = 28.92$, $p < .001$). Initiatives that incorporated CNL preceptors were perceived as more successful than those that did not ($B = 6.24$, $p = .002$). The levels of consistency in CNL practice, and CNLs reporting to unit managers were both associated with significantly lower scores ($B = 17.72$, $p < .001$ & $B = 6.13$, $p < .001$, respectively). Finally, there was a slightly, but significantly, lower reporting of success at Federal settings than other types of settings ($B = 5.58$, $p = .018$).

The CNL reporting structure was also found to be a barrier to CNL success in the pattern matching CNL case study (Bender, Spiva, et al., 2018). Interviews with health system multidisciplinary clinicians and administrative leaders elucidated how specific structuring characteristics, like reporting to a director, was linked to consistency in CNL workflow, while CNL reporting to a unit manager was linked to significantly less consistency in CNL workflow. Inconsistent CNL workflow led to inconsistent outcomes. Overall, the empirical findings supported the hypothesized relationship between CNL structuring and practice, and provided data supporting specific structuring characteristics, such as who a CNL reports to, that can influence CNL practice consistency, and thereby its ability to achieve expected outcomes.

Another recent prospective case study identified specific interactions between CNLs and the frontline clinical team that helped to explain why one hospital's CNL care model implementation resulted in heterogeneous CNL workflows with differing levels of evidence informed CNL practices across the CNL units (Bender, Burtson, & Lefkowitz, 2018). This was despite well

planned and executed system-level implementation strategies for CNL model adoption. The findings suggest that there may not be a single, standardized CNL workflow; that CNL practice will differ based on contextual needs, such as patient population needs and existing clinical routines and resource availability. However, studies have repeatedly shown certain implementation factors that influence effectiveness, such as CNL reporting structure (Bender et al., 2016b, Bender, Spiva, et al, 2018), suggesting that there is a 'core' set of CNL structures and processes that can be expected to result in care quality improvement.

Future Research

Because of this identified CNL implementation variability, it is important to account for CNL implementation in CNL effectiveness studies to establish the causal link between CNL implementation characteristics and outcomes. The CNLRC is currently launching a hybrid type two implementation-effectiveness study. The study will evaluate the effect of CNL-integrated care delivery on changes in nationally endorsed quality and safety outcomes using the 'robust' ITS approach, and identify characteristics of CNL implementation and practice that are sufficient and necessary to achieve outcomes. The study will leverage a natural experiment in CNLRC member and affiliate health systems. The study will leverage sophisticated analytic methods that capture the dynamic interdependency of contextual factors in nursing practice. This study will be the first to examine nursing as an organizational strategy to increase care quality and safety, measure its effectiveness, and to provide specific 'recipes' of successful CNL care model configurations that health systems can match to their needs to achieve intended quality and safety outcomes. The study leverages prior CNLRC efforts to conceptualize CNL practice, develop rigorous tools to measure CNL practice and outcomes, and continued academic-practice-policy partnerships, all of which has made this important national-level study possible.

Conclusion

The CNL is a nursing education and practice initiative that has expanded and grown over the course of 18 years, originating from an information-gathering taskforce to a formalized practice-research collaborative. The CNL initiative was cocreated by diverse stakeholders committed to vision that nurses, educated and organized into specific frontline models of care, have the ability to effect wide-ranging improvements in care quality and safety. Ultimately, these taskforces designed and tested a nursing model of care that could achieve these goals. The CNL care model has demonstrated its potential to achieve outcomes for patient populations with acute and chronic disease care needs. Academic-practice-policy partnership has been critical in advancing the CNL initiative. As Harris, Stanley & Rosseter express it, "clinical and academic partnerships create transformational avenues that result in patient-centered, forward-thinking, outcomes-driven work" (Harris, Stanley, & Rosseter, 2011, p. 40). With this driving spirit, the CNLRC aims to further the CNL knowledge base, through a comprehensive, theory-informed, and contextually sensitive approach to developing an evidence-based model of nursing care delivery that has great potential for transferability to health systems considering care delivery redesign to achieve consistent patient quality outcomes.

Funding

Authors did not receive any specific grants from funding agencies in the public, commercial, or not-for-profit sectors to produce this article.

Supplementary materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.outlook.2019.02.007.

REFERENCES

American Association of Colleges of Nursing (AACN). (2007). White paper on the education and role of the clinical nurse leader. Retrieved from http://aacn.nche.edu/publications/whitepapers/clinicalnurseleader07.pdf.

Bartels, J. E. (2005). Educating nurses for the 21st century. *Nursing & Health Sciences, 7*(4), 221–225.

Bender, M. (2014). The current evidence base for the clinical nurse leader: A narrative review of the literature. *Journal of Professional Nursing, 30*(2), 110–123. http://doi.org/10.1016/j.profnurs.2013.08.006.

Bender, M. (2016a). Clinical Nurse Leader integration into practice: Developing theory to guide best practice. *Journal of Professional Nursing, 32*(1), 32–40, doi:10.1016/j.profnurs.2015.06.007.

Bender, M. (2016b). Conceptualizing Clinical Nurse Leader practice: An interpretive synthesis. *Journal of Nursing Management, 24*(1), E23–E31, doi:10.1111/jonm.12285.

Bender, M. (2017). Clinical Nurse Leader integrated care delivery: An approach to organizing nursing knowledge into practice models that promote interprofessional, team-based care. *Journal of Nursing Care Quality, 32*(3), 189–195, doi:10.1097/NCQ.0000000000000247.

Bender, M., Avolio, A., Baker, P., Harris, J. L., Hilton, N., Hites, L., Roussel, L., Shirley, B., Thomas, T., & Williams, M. (2018). Developing the Clinical Nurse

Leader survey instrument: A modified Delphi study. *Journal of Nursing Care Quality, 33*(4), 300–308, doi:10.1097/NCQ.0000000000000310.

Bender, M., Burtson, P., & Lefkowitz, D. (December). The relationality of intervention, context, and implementation: A prospective case study examining the adoption of an evidence-informed nursing care model. *Abstract presented at the 11th annual conference on the science of dissemination and implementation.*

Bender, M., Connelly, C. D., Glaser, D., & Brown, C. (2012). Clinical nurse leader impact on microsystem care quality. *Nursing Research, 61*(5), 326–332. http://doi.org/10.1097/NNR.0b013e318265a5b6.

Bender, M., Cruz, M., Murphy, M., Ombao, H., & Gillen, D. (June). Measuring consistency in quality outcomes over time: Application of the robust interrupted time series model. *Poster presented at the academy health annual research meeting.*

Bender, M., & Feldman, M. S. (2015). A practice theory approach to understanding the interdependency of nursing practice and the environment: Implications for nurse-led care delivery models. *Advances in Nursing Science, 38*(2), 96–109. http://doi.org/10.1097/ANS.0000000000000068.

Bender, M., Spiva, L., Patrick, S., Meffert, S., Moton, L., Clark, S., Mathis, K., Leclerc, L., Knotts, K., & Mount, A. (2019). Participatory research in action: Clinical Nurse Leader co-knowledge production and quality improvement in a seamless trajectory. *Journal of Nursing Care Quality*, doi:10.1097/NCQ.0000000000000386. Published ahead of print: March 4, 2019.

Bender, M., Spiva, L., Su, W., & Hites, L. (2018). Organizing nursing knowledge and practice into care delivery models that catalyze quality: A Clinical Nurse Leader case study. *Journal of Nursing Management, 26*, 563–662, doi:10.1111/jonm.12596.

Bender, M., Williams, M., & Su, W. (2016a). Diffusion of a nurse-led healthcare innovation: Describing certified Clinical Nurse Leader integration into care delivery. *The Journal of Nursing Administration, 46*(7–8), 400–407. http://doi.org/10.1097/NNA.0000000000000365.

Bender, M., Williams, M., Su, W., & Hites, L. (2016b). Clinical Nurse Leader integrated care delivery to improve care quality and safety: Factors influencing perceived success. *Journal of Nursing Scholarship, 48*(4), 414–422, doi:10.1111/jnu.12217.

Bender, M., Williams, M., Su, W., & Hites, L. (2017). Refining and validating a conceptual model of Clinical Nurse Leader integrated care delivery. *Journal of Advanced Nursing, 73*(2), 448–464, doi:10.1111/jan.

Butler, M., Collins, R., Drennan, J., Halligan, P., O'Mathúna, D. P., Schultz, T. J., et al. (2011). Hospital nurse staffing models and patient and staff-related outcomes. *Cochrane Database of Sysematict Reviews*(7). CD007019 http://doi.org/10.1002/14651858.CD007019.pub2.

Clavo-Hall, J. A., Bender, M., & Harvath, T. A. (2018). Roles enacted by Clinical Nurse Leaders across the healthcare spectrum: A systematic literature review. *Journal of Professional Nursing, 34*(4), 259–268.

Cruz, M., Bender, M., & Ombao, H. (2017). A robust interrupted time series model for analyzing complex health care intervention data. *Statistics in Medicine, 36*(29), 4660–4676. http://doi.org/10.1111/j.1467-9892.1988.tb00459.x.

Cruz, M., Gillen, D. L., Bender, M., & Ombao, H. (2019). Assessing health care interventions via an interrupted time series model: Study power and design considerations. *Statistics in Medicine*, doi:10.1002/sim.8067 *Published ahead of print.*

Drenkard, K., & Cohen, E. (2004). Professional issues. Clinical nurse leader: Moving toward the future. *The Journal of Nursing Administration, 34*(6), 257–260.

Drenkard, K. N. (2004). The clinical nurse leader: A response from practice. *Journal of Professional Nursing, 20*(2), 89–96.

Foster, J., Clark, A., Heye, M., Rosenow, D., Baldwin, K., Villagomez, E., et al. (2011). Differentiating the CNS and CNL roles. *Nursing Management, 42*(1), 51.

Fox, O. H. (2017). Using Voice thread to promote collaborative learning in on-line Clinical Nurse Leader courses. *Journal of Professional Nursing, 33*(1), 20–26.

Gazaway, S. B., Anderson, L., Schumacher, A., & Alichnie, C. (2018). Effect of mentoring on professional values in model C clinical nurse leader graduates. *Journal of Nursing Management*. *http://doi.org/10.1111/jonm.12633*.

Gerard, S., Rn, M. G. M., Grossman, S., & Godfrey, M. (2012). Course strategies for Clinical Nurse Leader development. *Journal of Professional Nursing, 28*(3), 147–155. http://doi.org/10.1016/j.profnurs.2011.11.012.

Haase-Herrick, K. S., & Herrin, D. M. (2007). The American organization of nurse executives' guiding principles and American association of colleges of nursing's Clinical Nurse Leader: A lesson in synergy. *The Journal of Nursing Administration, 37*(2), 55–60.

Harris, J., Roussel, L., & Thomas, P. L. (2018). *Initiaitng and sustaining the clinical nurse leader role: A practical guide 3rd edition.* Burlington MA: Jones & Bartlett Learning.

Harris, J., Walters, S., Quinn, C., Stanley, J., & McGuinn, K. (2006). The clinical nurse leader role: A pilot evaluation by an early adopter. https://faculty.sites.uci.edu/ncrc/files/2016/01/8.pdf.

Harris, J. L., Stanley, J., & Rosseter, R. (2011). The Clinical Nurse Leader: Addressing health-care challenges through partnerships and innovation. *Journal of Nursing Regulation, 2*(2), 40–46.

Hicks, F. D., & Rosenberg, L. (2016). Enacting a vision for a master's entry clinical nurse leader program: rethinking nursing education. *Journal of Professional Nursing, 32*(1), 41–47. http://doi.org/10.1016/j.profnurs.2015.06.002.

Institute of Medicine (IOM). (2001). *Crossing the quality chasm: A new health system for the 21st century* (pp. 1–360). Washington, DC: National Academies Press.

Institute of Medicine (IOM). (2011). *The future of nursing: leading change, advancing health*. Washington, DC: The National Academies Press.

Jukkala, A., Greenwood, R., Motes, T., & Block, V. (2013). Creating innovative clinical nurse leader practicum experiences through academic and practice partnerships. *Nursing Education Perspectives, 34*(3), 186–191.

Kaack, L., Bender, M., Finch, M., Borns, L., Grasham, K., Avolio, A., et al. (2018). A Clinical Nurse Leader (CNL) practice development model to support integration of the CNL role into microsystem care delivery. *Journal of Professional Nursing, 34*(1), 65–71. http://doi.org/10.1016/j.profnurs.2017.06.007.

Kitson, A. L., Muntlin Athlin, A., Conroy, T., & on behalf of the International Learning Collaborative. (2014). Anything but basic: Nursing's challenge in meeting patients' fundamental care needs. *Journal of Nursing Scholarship, 46*(5), 331–339. http://doi.org/10.1111/j.1365-2648.2009.05073.x.

Lammon, C. A. B., Stanton, M. P., & Blakney, J. L. (2010). Innovative partnerships: The clinical nurse leader role in diverse clinical settings. *Journal of Professional*

Nursing, 26(5), 258–263. http://doi.org/10.1016/j.profnurs.2010.06.004.
Long, K. A. (2004). Preparing nurses for the 21st century: Reenvisioning nursing education and practice. *Journal of Professional Nursing, 20*(2), 82–88.
Maag, M. M., Buccheri, R., Capella, E., & Jennings, D. L. (2006). A conceptual framework for a clinical nurse leader program. *Journal of Professional Nursing, 22*(6), 367–372. http://doi.org/10.1016/j.profnurs.2005.11.002.
McKeon, L. M., Norris, T. L., Webb, S., Hix, C., Ramsey, G., & Jacob, S. R. (2009). Teaching clinical nurse leaders how to diagnose the clinical microsystem. *Journal of Professional Nursing, 25*(6), 373–378. http://doi.org/10.1016/j.profnurs.2009.04.001.
Moore, P., Schmidt, D., & Howington, L. (2014). Interdisciplinary preceptor teams to improve the clinical nurse leader student experience. *Journal of Professional Nursing, 30*(3), 190–195. http://doi.org/10.1016/j.profnurs.2013.09.013.
Nance-Floyd, B., & Zomorodi, M. (2018). Clinical site development for the clinical nurse leader in a rural primary care setting. *Journal of Nursing Care Quality, 33*(2), 95–99. http://doi.org/10.1097/NCQ.0000000000000322.
Needleman, J. (2017). Nursing skill mix and patient outcomes. *BMJ Quality & Safety, 26*(7), 525–528. http://doi.org/10.1136/bmjqs-2016-006197.
Nelson, R. (2010). The clinical nurse leader. *American Journal of Nursing, 110*(1), 22–23. http://doi.org/10.1097/01.NAJ.0000366046.89571.24.
Sherman, R., Clark, J. S., & Maloney, J. (2008). Developing the Clinical Nurse Leader role in the twelve bed hospital model: An education/service partnership. *Nurse Leader, 6*(3), 54–58.
Sherman, R. O. (2008). Factors influencing organizational participation in the Clinical Nurse Leader project. *Nursing, 26*(4), 236. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=rzh&AN=2009995705&site=ehost-live.
Stachowiak, M. E., & Bugel, M. J. (2013). The clinical nurse leader and the case manager: Are both roles needed. *American Journal of Nursing, 113*(1), 59–63.
Stanley, J. M., Hoiting, T., Burton, D., Harris, J., & Norman, L. (2007). Implementing innovation through education-practice partnerships. *Nursing Outlook, 55*(2), 67–73. http://doi.org/10.1016/j.outlook.2007.01.009.
Thompson, P., & Lulham, K. (2007). Clinical nurse leader and clinical nurse specialist role delineation in the acute care setting. *The Journal of Nursing Administration, 37*(10), 429–431.
Tornabeni, J. (2006). The evolution of a revolution in nursing. *Journal of Nursing Administration, 36*(1), 3–6.
Tornabeni, J., & Miller, J. F. (2008). The power of partnership to shape the future of nursing: The evolution of the clinical nurse leader. *Journal of Nursing Management, 16*(5), 608–613. http://doi.org/10.1111/j.1365-2834.2008.00902.x.
Webb, S., & McKeon, L. (2014). A model for preparing faculty to teach model C clinical nurse leader students. *Journal of Nursing Education, 53*(7), 421–425. http://doi.org/10.3928/01484834-20140617-05.
Wesolowski, M. S., Casey, G. L., Berry, S. J., & Gannon, J. (2014). The clinical nurse leader in the perioperative setting: A preceptor experience. *AORN Journal, 100*(1), 30–41. http://doi.org/10.1016/j.aorn.2013.11.021.
Williams, M., Avolio, A. E., Ott, K. M., & Miltner, R. S. (2016). Promoting a Strategic Approach to Clinical Nurse Leader Practice Integration. *Nursing Administration Quarterly, 40*(1), 24–32. http://doi.org/10.1097/NAQ.0000000000000143.
Williams, M., & Bender, M. (2015). Growing and sustaining the CNL initiative: Shifting the focus from pioneering innovation to evidence-driven integration into healthcare delivery. *Journal of Nursing Administration, 45*(11), 540–543.