

Preparing New Nurses To Improve The Systems In Which They Work: A Matter Of Degree Or Skillset?

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Abstract

The multitude of players, rules, and economic factors involved in organizing and delivering healthcare in the US today requires a highly skilled workforce, who can go above and beyond excellence at the practitioner level by acting as change agents to continuously improve the systems in which they work. Early acquisition of quality and safety competencies, along with leadership and inter-professional collaboration, systems thinking, and health economics are essential for preparing new nurses for the demands of their future jobs. Using these competency domains as a framework for evaluation, the purpose of this descriptive study was to examine program coordinators' assessments by comparing them across all types of nursing programs. Seventy-nine pre-licensure nursing program coordinators in California completed an electronic evaluation survey for an overall return rate of 55 percent. In general, all domains examined, with the exception of health economics, had relatively high levels of competency in all pre-licensure programs according to program coordinators assessments. Nevertheless, there were gaps in students' skills across the different programs that can inform continuous improvement efforts in pre-licensure nursing education. As this study was the first to report on competency level assessments for domains that go beyond quality and safety such as health economics, future studies offering practical strategies to carve out space in the nursing curricula and progressively integrate these competencies throughout the different types of pre-licensure programs are needed.

Keywords: Pre-licensure Nursing Education, Change Management, Healthcare Improvement, Health Economics, California.

Introduction

More than ten years ago, the Institute of Medicine (IOM) published two groundbreaking reports: (1) *To Err is Human* (1999) and (2) *Crossing the Quality Chasm* (2001) that demonstrated that US healthcare suffered from serious deficiencies. *To Err is Human* determined healthcare was unsafe by estimating that avoidable medical errors contributed to 44,000–98,000 deaths at US hospitals annually (IOM, 1999). Subsequent studies have suggested these may be underestimates (Leape et al., 2009). *Crossing the Quality Chasm* went beyond safety and established that the healthcare system was incapable of providing the public with high quality care (Berwick, 2002). It also stated that for the system to achieve high levels of quality, the entire field needed to be redesigned (IOM, 2001). Together, the two reports called for a healthcare system that is safe, effective, patient-centered, efficient, delivered on a timely basis, and absent of disparities based on race or ethnicity (Berwick, 2002).

The relationship of high quality and safe patient care with the way health professionals are educated was emphasized in the IOM report entitled: *A Bridge to Quality* (2003). This report identified five core competencies to be incorporated into health professions education to ensure that clinicians are prepared to meet the needs of the 21st century health system. These competencies are the ability to (A) provide patient-centered care; (B) work in interdisciplinary teams; (C) employ evidence-based practice; (D) apply quality improvement (QI); and (E) utilize informatics. Recent studies have also linked concepts of human interaction, patient safety, systems theory, and possession of management and communication skills to high quality care (Berwick, 2011 and Leape et al., 2009).

Since these reports were released, the social imperative for a better healthcare system has increased. As a result, efforts have proliferated on both public and private sectors, but

improvement progress has been painstakingly slow (Leape et al., 2009 and Dentzer, 2011). For example, while the science behind measuring healthcare quality or documenting its absence continues to evolve (Dentzer, 2011), many organizations—including academic institutions—still struggle with the implementation of a culture of trust, reporting transparency, and discipline (Leape et al., 2009). Similarly, while most published quality improvement curricula for the health professions demonstrate improvement in learner’s knowledge or confidence to perform QI (Boonyasai et al., 2007), this development has been primarily discipline-specific and has lacked inter-disciplinary focus (Kiersma, Plake, and Darbishire, 2011). As a result, many clinicians are not trained to lead the scale and type of systemic change that is required in healthcare today (Berwick, 2011).

Most recently, as the costs of US healthcare have become less and less sustainable (2010 healthcare expenditures amounted over ten times the spent in 1980), special attention has been given to the efficiency of the system: its ability to produce better patient outcomes while controlling the costs of health and illness (Berwick, 2011; Martin, Lassman, Washington, & Catlin, 2012). Given these circumstances, nursing, like any healthcare profession, can become an object of change, or an agent of change. On one side, due to poor articulation of its economic value, nursing may be affected by the organizational and economic shifts most quickly and severely than other disciplines (Keepnews, 2011). On another side, as the largest healthcare workforce in the US spanning across a multitude of settings, nursing is positioned well to lead systemic improvement efforts in many organizations (IOM, 2010). According to Edward Deming’s theory of “Profound Knowledge”, not all changes result in improvement, but improvement cannot come without change (Deming, 1994). Therefore, if the system ought to change, nurses cannot continue to receive training to care for patients following existing

processes in already established institutions. Instead, nursing education needs to shift its emphasis to the development of knowledge, skills, and attitudes (KSAs) needed to transform systems of healthcare delivery (Berwick, 2011 and Leape et al., 2009).

Nursing is one of a few professions that has multiple educational paths for entry. In most states, a person can enter the profession after completing an entry-level master degree program (ELM), a baccalaureate degree program (BSN), an associate degree (ADN), or a 3-year, hospital based diploma program in nursing. Since the 1950s, diploma programs have waned while associate and BSN programs have become more popular (Spetz, 2002).

To address the challenge of preparing all pre-licensure nurses (associate, diploma, baccalaureate, and master's entry levels) with the competencies needed to continuously improve the quality and safety of the healthcare systems in which they work, the Robert Wood Johnson Foundation (RWJF) funded the Quality and Safety Education for Nurses (QSEN) project. Following the work outlined in the IOM health professions education report (2003), the QSEN group has: (A) defined six core competencies, including the five outlined by the IOM report and added safety; (B) identified targets for the Knowledge, Skills, and Attitudes (KSAs) to be developed in nursing pre-licensure programs for each competency; (C) piloted implementation of these concepts at 15 nursing schools; (D) supported the development of a Web site and materials for helping faculty incorporate the content; and (E) conducted eight QSEN Institutes across the country to teach nursing faculty how to integrate the QSEN competencies into pre-licensure nursing curricula (Barnsteiner, Disch, McGuinn, Chappell, & Swartwout, 2013).

In addition to quality and safety curricula, other competencies such as leadership and inter-professional collaboration, systems thinking, and basic health economic concepts are needed to improve today's healthcare systems. Using all these competencies as a framework for

evaluation, this study attempted to find out if there was a difference among pre-licensure nursing programs in California in their preparation of entry-level nurses to effect change in the systems of healthcare delivery in which they work.

Literature Review

In order to better understand the state of the science related to pre-licensure nursing curricula, a systematic review of the literature was conducted. The following databases were accessed to search for articles published between 2007 and September 2013: PubMed, Cochrane, MEDLINE, and Google Scholar. The following MeSH terms were used: “safety management” or “patient safety” or “quality improvement” or “quality assurance” or “leadership” or “health economics” or “inter-professional” or “change management” or “complex systems” or “systems theory” and “education, nurs*” and “curriculum.” Only articles that described the above competencies in US nursing curriculum were included.

One hundred seven articles were identified and the abstracts evaluated for inclusion and exclusion criteria. Studies that were not about curriculum or any of the above competencies, or were not in English were excluded. Articles that focused on curriculums outside the United States, as well as editorials, letters to the editor, and commentaries, also were excluded. Finally, systematic reviews pertaining to health professions at large or other health-related professions were kept. A total of 34 articles were included.

Health Professions Competencies Development

The emphasis of a standard core set of competencies for all healthcare professions found in the IOM Health Professions report (2003) has contributed to various education initiatives.

A systematic review of the literature from 1966 to 2010 of health professional curricula, including medicine, nursing, pharmacy, and dentistry showed that multiple methods such as

lectures, workshops, objective structured clinical examinations, standardized patients, simulation exercises, root cause analysis, quality assurance projects, and other interactive learning methods have been used to promote patient safety. This development of patient safety curricula, however, has been primarily discipline-specific, with little inter-disciplinary research found (Kiersma, Plake, and Darbshire, 2011). Another systematic review and meta-analysis found moderate to large effect sizes for the relationship between simulation technology as an instructional approach and safety knowledge, skills, and behaviors (inclusive of patient outcomes) in health profession education, broadly speaking (Cook et al., 2011).

To address the 2003 IOM report highlighting the importance for inter-professional education and the need to increase the science of patient safety and quality improvement, the Department of Veterans Affairs (VA), in 2009, started the enrollment of nurse fellows in their well recognized VA National Quality Scholars (VAQS) program (Patrician et al., 2013). Five advanced academic degrees, 42 projects, 29 teaching activities, 44 presentations, 36 publications, six grants funded or submitted, and two awards have resulted since nurses fellows joined the VAQS program in 2009 (Estrada et al., 2012).

Nursing Competencies Development

In 2006, the American Association of Colleges of Nursing (AACN), which accredits both baccalaureate and master's programs, revised the 1998 version of the Essentials of Baccalaureate Education for Professional Nursing Practice to include competencies related to quality and patient safety. The most recent version of the Essentials document not also incorporates these competencies but also describes the related outcomes expected of bachelors of science in nursing (BSN) graduates (AACN, 2008; Forbes and Hickey, 2009). A list of the Essential elements of this document is listed in Table 1. Similarly, the National League for Nursing Accreditation

Commission, which accredits associate degree programs, developed a curriculum related standard (4.10) that states the expectation of aligning educational outcomes with “nationally established patient health and safety goals” (NLNAC, 2013, p.4). Another initiative derived from the IOM Health Professions report (2003) is the Quality and Safety Education for Nurses (QSEN) project. Funded by the Robert Wood Johnson Foundation, the QSEN initiative has (A) defined six core competencies, including the five outlined by the IOM health professions report and added safety; (B) identified targets for the Knowledge, Skills, and Attitudes (KASs) to be developed in nursing pre-licensure programs for each competency; (C) piloted implementation of these concepts at 15 nursing schools; (D) supported the development of a Web site and materials for helping faculty incorporate the content; and (E) conducted eight QSEN Institutes across the country to teach nursing faculty how to integrate the QSEN competencies into pre-licensure nursing curricula (Barnsteiner, Disch, McGuinn, Chappell, & Swartwout, 2013). Parallels exist between the QSEN competencies and AACN’s latest Essentials, such as shared focus on organizational and systems leadership for quality care; scholarship for evidence-based practice; information management and application of patient care technology; healthcare policy, finance, and regulatory environments associated with quality and safety; and inter-professional communication and collaboration for improving patient health (Barton, Armstrong, Preheim, Gelmon, & Andrus, 2009).

Most recent studies have found that, despite the efforts on educating new nurses in quality improvement (QI) methodologies following competency-based principles in the last few years, no much difference was found in the participation of new nurses in hospital quality improvement activities before and after those interventions (Djukic et al., 2013). About 40% of new nurses thought that they were “poorly” or “very poorly” prepared about or had “never heard

of QI. Their perceptions of preparations varied widely by the specific topic. BSN graduates reported significantly higher levels of preparation than ADN graduates in evidence-based practice; assessing gaps in practice; teamwork; and collaboration; and many of the research-type skills such as data collection, analysis, measurement, and measuring resulting changes (Kovner, Brewer, Yingrengreung, and Fairchild, 2010). A cross-sectional study in which students (n = 238) in all 4 years of an undergraduate nursing program were asked to complete the Health Profession Education in Patient Safety found that students reported confidence in learning about a variety of patient safety competencies. However, there were decreasing levels of confidence in the third- and fourth-year students and low-to-moderate correlation between classroom and clinical responses. These findings support the importance of consistently engaging students in safety principles early in and throughout their healthcare programs (Duhn et al., 2012).

Preliminary, unpublished work by Platt, Kwasky, and Spetz (N.d.) on health economics competences for BSN programs was the only source of information found in relation to health economic competencies in pre-licensure nursing curricula.

Table 1. The Essentials of Baccalaureate Education for Professional Nursing Practice	
ESSENTIAL ELEMENT	
I	Liberal Education for Baccalaureate Generalist Nursing Practice
II	Basic Organizational and Systems Leadership for Quality Care and Patient Safety
III	Scholarship for Evidence-Based Practice
IV	Information Management and Application of Patient Care Technology
V	Healthcare Policy, Finance, and Regulatory Environments
VI	Inter-professional Communication and Collaboration for Improving Patient Health Outcomes
VII	Clinical Prevention and Population Health
VIII	Professionalism and Professional Values
IX	Baccalaureate Generalist Nursing Practice

Nursing Competencies Development: California

A four-year initiative funded by the Gordon and Betty Moore Foundation was launched in 2009 to implement and evaluate the impact of incorporating QSEN content into nursing curricula in 22 schools of nursing in the San Francisco Bay Area. As of 2013, the majority of schools have instituted many of the KASs for the 6 QSEN competencies; significant curricular change is occurring; and academic-clinical partnerships have been strengthened. Despite this progress, inter-professional experiences continue to show particularly low inclusion in the curricula. One major limitation of this study is that only BSN programs were included in the rigorous evaluation or “deep dive” of the QSEN long-term impact on nursing curricula, leaving ADN programs out of the more extensive longitudinal assessment (Disch, Barnsteiner, and McGuinn, 2013).

Finally, the literature review helped affirm that no prior studies had been conducted that described the current state of nursing education in California with respect to competencies that went beyond quality and safety but that are also needed to effect change and improve systems of healthcare delivery.

Methods

This descriptive study was conducted using survey methods and an electronic survey management program (Survey Monkey).

Sample

Pre-licensure programs offered by 131 schools and approved by the California Board of Registered Nursing (CABRN) (n = 143) were the target sample for associate (n = 88), baccalaureate (n = 38), and master’s entry level (n = 17) nursing programs. A list of all the approved pre-licensure programs and their phone numbers was retrieved from the CABRN

website on February 6, 2013. Contact e-mail addresses for program directors/coordinators at each institution were obtained browsing schools' websites or via phone. If a school had more than one program and, as a result, more than one program coordinator or director, attempts were made to obtain the e-mail addresses of all program coordinators involved. Contact e-mail addresses could not be found for 11 programs. As a result, the total number of pre-licensure program coordinators eligible to participate was 132, representing 121 schools in California.

Instrument

The 29-item survey entitled *California Entry-Level Nursing Programs Inventory of Competencies* (Appendix A) included: (A) three demographic questions; (B) eleven paired questions to: (1) assess leadership and inter-professional (IP) collaboration, systems thinking, quality improvement, patient safety, and healthcare economics competencies, and (2) determine the existence of this content in course assignments, lectures, and other curricular vehicles; and (C) four questions about the assessment of quality and safety competencies along with healthcare economics and its perceived barriers in nursing programs at large. The survey questions about leadership, systems thinking, quality improvement, and patient safety were based on AACN essentials (2008) and QSEN content (Cronenwett et al. 2007). The questions on healthcare economics were based on the preliminary work of Platt, Kwasky, and Spetz (N.d.) An expert panel of four nursing faculty and three practice members, established the face validity of all the questions, and pilot-tested the survey to ensure its readability and ease of use. Changes were made on the basis of the panel's recommendations.

Procedure

All surveys were administered via an electronic management system (Survey Monkey). The program coordinators' 132 e-mails were uploaded into Survey Monkey's invitation collector

to send personalized cover letters with unique survey links per addressee. The SurveyMonkey server limited responses to one per e-mail address, keeping track of who responded without making it visible to the investigator. As a result, the investigator could not link respondents e-mails to their specific answers. To avoid confusion in situations where the same program director oversees multiple programs, instructions were included in the demographic section of the survey for respondents to "...choose the program [they were] the most familiar with from the list [included]" (Herrera, 2013). Following the Dillman design method (2007), the cover letter explained the project's purpose and usefulness to encourage participation. The letter contained a link to the electronic survey, provided instructions in case the message was delivered in error and an option to opt-out from the survey. Respondents were assured of the confidentiality of the information they shared, and response to the survey served as consent. The survey was open for 12 days and 3 electronic reminder notices containing a link to the survey were sent to non-responders before the survey closed on April 12, 2013.

Data Analysis

The survey management service provided data on school demographics, survey questions, and open-ended comments to the investigator as a relational database. Quantitative data were downloaded to an Excel spreadsheet and descriptive statistics were used to examine the responses to each survey question. Qualitative data were reviewed for themes. Programs were classified as ADN (including LVN to ADN), BSN (including Accelerated BSNs), and ELM. The altogether, comprehensive results by specific competency level and teaching methodology are shown in Table 2. This data set was organized and collapsed to obtain compound results by competency domain. Assessment of student competencies and respective pedagogical modalities used were compared for each competency domain across all pre-licensure programs.

Table 2 (continued). Altogether Results by Competency Level and Teaching Methodology

Competency Areas	Outcome		Response Options	ADN		BSN		ELM			
	AND & BSN	ELM		n	%	n	%	n	%		
Systems Thinking	Demonstrate an awareness of complex organizational systems.	Apply complexity science and systems theory in designing / evaluating care delivery systems to reduce care fragmentation and improve patient outcomes.	Highly Competent	1	2.1%	2	10.5%	1	12.5%		
			Moderately Competent	27	57.4%	9	47.4%	6	75.0%		
			Slightly Competent	15	31.9%	8	42.1%	1	12.5%		
			Not a Competency for Us	4	8.5%	0	0.0%	0	0%		
			<i>Teaching methodology (respondents could choose more than one option)</i>								
			Single Course	16	34.0%	10	52.6%	0	0%		
			2 or more Courses	26	55.3%	8	42.1%	8	100%		
			Project	3	6.4%	4	21.1%	3	38%		
			Seminar	8	17.0%	6	31.6%	2	25%		
			Talk	3	6.4%	2	10.5%	1	13%		
			Not Applicable	4	8.5%	0	0.0%	0	0%		
Quality Improvement (QI)	Apply concepts of quality and safety using structure, process, and outcome measures to identify clinical questions and change current practice.	Implement evidence-based plans based on trend analysis and quantify the impact on quality and safety.	Highly Competent	8	17.8%	6	31.6%	3	37.5%		
			Moderately Competent	31	68.9%	7	36.8%	5	62.5%		
			Slightly Competent	3	6.7%	4	21.1%	0	0%		
			Not a Competency for Us	3	6.7%	2	10.5%	0	0%		
			<i>Teaching methodology (respondents could choose more than one option)</i>								
			Single Course	6	12.8%	0	0.0%	0	0%		
			2 or more Courses	40	85.1%	16	88.9%	8	100%		
			Project	10	21.3%	11	61.1%	3	38%		
			Seminar	9	19.1%	8	44.4%	1	13%		
	Talk	8	17.0%	3	16.7%	1	13%				
	Not Applicable	2	4.3%	1	5.6%	0	0%				
	Apply quality improvement processes to effectively monitor performance measures, including nurse sensitive indicators in the environment of care.	Use quality improvement methods to promote culturally responsive, safe, timely, effective, efficient, equitable, and patient-centered care.	Highly Competent	7	15.2%	4	21.1%	2	25.0%		
			Moderately Competent	25	54.3%	7	36.8%	6	75.0%		
			Slightly Competent	12	26.1%	7	36.8%	0	0%		
			Not a Competency for Us	2	4.3%	1	5.3%	0	0%		
<i>Teaching methodology (respondents could choose more than one option)</i>											
Single Course			8	17.0%	4	21.1%	0	0%			
2 or more Courses			35	74.5%	14	73.7%	7	88%			
Project			9	19.1%	8	42.1%	4	50%			
Seminar	7	14.9%	7	36.8%	2	25%					
Talk	9	19.1%	3	15.8%	1	13%					
Not Applicable	1	2.1%	1	5.3%	0	0%					

Table 2 (continued). Altogether Results by Competency Level and Teaching Methodology

Competency Areas	Outcome ADN, BSN, and ELM	Response Options	ADN		BSN		ELM		
			n	%	n	%	n	%	
Patient Safety	Promote factors that create a culture of safety and continuous improvement.	Highly Competent	20	42.6%	6	31.6%	1	12.5%	
		Moderately Competent	21	44.7%	10	52.6%	5	62.5%	
		Slightly Competent	5	10.6%	3	15.8%	2	25.0%	
		Not a Competency for Us	1	2.1%	0	0.0%	0	0%	
		<i>Teaching methodology (respondents could choose more than one option)</i>							
		Single Course	2	4.3%	0	0.0%	1	13%	
		2 or more Courses	44	93.6%	19	100.0%	6	75%	
		Project	12	25.5%	8	42.1%	4	50%	
		Seminar	9	19.1%	5	26.3%	3	38%	
		Talk	7	14.9%	4	21.1%	1	13%	
		Not Applicable	1	2.1%	0	0.0%	0	0%	
Health Economics	Define basic economic concepts (e.g. resource scarcity, opportunity cost, production function, etc.) and identify how their application may affect the daily activities of healthcare staff and care delivery.	Highly Competent	1	2.2%	0	0%	0	0%	
		Moderately Competent	13	28.3%	6	31.6%	6	75.0%	
		Slightly Competent	23	50.0%	10	52.6%	2	25.0%	
		Not a Competency for Us	9	19.6%	3	15.8%	0	0%	
		<i>Teaching methodology (respondents could choose more than one option)</i>							
		Single Course	12	26.1%	9	50.0%	2	25%	
		2 or more Courses	23	50.0%	6	33.3%	5	63%	
		Project	3	6.5%	5	27.8%	3	38%	
		Seminar	7	15.2%	4	22.2%	2	25%	
		Talk	5	10.9%	0	0.0%	2	25%	
	Not Applicable	8	17.4%	2	11.1%	0	0%		
	Describe how incentives (financial and non-financial) may influence healthcare decision-making and the interactions among payers, providers, and patients.	Highly Competent	2	4.3%	0	0%	1	12.5%	
		Moderately Competent	13	28.3%	7	36.8%	5	62.5%	
		Slightly Competent	20	43.5%	11	57.9%	1	12.5%	
		Not a Competency for Us	11	23.9%	1	5.3%	1	12.5%	
<i>Teaching methodology (respondents could choose more than one option)</i>									
Single Course		10	21.7%	12	63.2%	1	12.5%		
2 or more Courses		22	47.8%	5	26.3%	6	75.0%		
Project	0	0.0%	4	21.1%	1	12.5%			
Seminar	6	13.0%	2	10.5%	2	25.0%			
Talk	4	8.7%	1	5.3%	2	25.0%			
Not Applicable	12	26.1%	1	5.3%	1	12.5%			

Table 2 (continued). Altogether Results by Competency Level and Teaching Methodology

Competency Areas	Outcome ADN, BSN, and ELM	Response Options	ADN		BSN		ELM		
			n	%	n	%	n	%	
Health Economics (Continued)	Describe the influence of health insurance in healthcare consumption and provider reimbursement.	Highly Competent	3	6.4%	1	5.3%	0	0%	
		Moderately Competent	16	34.0%	4	21.1%	6	75.0%	
		Slightly Competent	15	31.9%	12	63.2%	2	25.0%	
		Not a Competency for Us	13	27.7%	2	10.5%	0	0%	
		<i>Teaching methodology (respondents could choose more than one option)</i>							
		Single Course	21	44.7%	9	47.4%	2	25%	
		2 or more Courses	13	27.7%	6	31.6%	6	75%	
		Project	2	4.3%	2	10.5%	2	25%	
		Seminar	6	12.8%	2	10.5%	2	25%	
		Talk	10	21.3%	2	10.5%	1	13%	
	Not Applicable	4	8.5%	2	10.5%	0	0%		
	Use cost-benefit and cost-effectiveness analytical techniques to assist in resource allocation decisions of competing quality and safety initiatives.	Highly Competent	2	4.3%	0	0%	0	0%	
		Moderately Competent	5	10.6%	5	26.3%	6	75.0%	
		Slightly Competent	18	38.3%	6	31.6%	1	12.5%	
		Not a Competency for Us	22	46.8%	8	42.1%	1	12.5%	
		<i>Teaching methodology (respondents could choose more than one option)</i>							
		Single Course	9	19.6%	6	31.6%	3	37.5%	
		2 or more Courses	13	28.3%	5	26.3%	4	50.0%	
		Project	2	4.3%	3	15.8%	3	37.5%	
		Seminar	2	4.3%	2	10.5%	1	12.5%	
Talk		5	10.9%	1	5.3%	1	12.5%		
Not Applicable	21	45.7%	7	36.8%	1	12.5%			

Results

Demographics

Responses were returned from 79 of the 143 program coordinators for an overall return rate of 55%. Fifty-one program coordinators did not respond the survey, one respondent opted-out, and an undeliverable e-mail message was received from another. Return rates were 58% (n = 51/88) for ADN programs, 50% (n = 19/38) for BSN programs, and 53% (n = 9/17) for ELM programs. By self-report, 76% (n = 60/79) of respondents were nursing program directors or coordinators, 30% (n = 24/79) identified themselves as Deans (including Associate Deans), 24% (n = 19/79) as Faculty members, and the remaining 19% (n = 15/79) respondents identified themselves as Other (this free text category included Chairs, Assistant Directors, and Lecturers). Fifty one percent (n = 40/79) of the respondents were from schools located in Southern California, 41% (n = 32/79) represented schools from Northern California, and 9% (n = 7/79) respondents belonged to schools in the Central Valley.

Assessment of Competencies

The majority of respondents (> 90%) reported they taught aspects of each competency domain in all nursing programs, using one or more of the teaching modalities listed in the survey (Table 3). The assessment of competency domains by program type (in order, with the highest competency level first) were:

- ADNs: Patient Safety, Leadership & IP Collaboration, QI, Systems Thinking, Health Economics
- BSNs: Patient Safety, Leadership & IP Collaboration, Systems Thinking, QI, Health Economics
- ELMs: QI, Leadership & IP Collaboration, Systems Thinking, Patient Safety, and Health Economics

The average percentage of program coordinators who reported higher levels of competency for each of the domains were: Leadership and IP Collaboration (87%), Patient Safety (82%), Quality Improvement (80%), Systems Thinking (76%), and Health Economics (45%).

Table 3 shows the breakdown of the combined highly competent and moderately competent responses for each competency domain by program type.

	ADN		BSN		ELM		Mean
Quality Improvement	78%	(71)	63%	(24)	100%	(16)	80%
Patient Safety	87%	(41)	84%	(16)	75%	(6)	82%
Leadership & IP Collaboration	87%	(81)	79%	(30)	94%	(15)	87%
Systems Thinking	68%	(63)	68%	(26)	93%	(14)	76%
Health Economics	30%	(55)	30%	(23)	75%	(24)	45%

Out of the three types of pre-licensure programs, ELMs reported top scores were the highest in 4 out of the 5 competency domains. ELM programs reported: (A) the highest scores for QI (100%), Leadership & IP Collaboration (94%), Systems Thinking (93%), and Health Economics (75%), and (B) the lowest score for Patient Safety (75%). The highest score for the Patient Safety domain was found in ADN programs (87%).

ADN top scores were higher than BSN scores in all competency domains but Health Economics. Actually, ADN and BSN Health Economics scores were the same (30%) and the lowest top scores of all. Health economics was highlighted as the least integrated competency across all pre-licensure programs.

Teaching Modalities

Almost every pedagogical method listed in the survey was used by some nursing program to teach each of the competency domains (Table 4). The most common methods by competency (in order, with most frequent first) were:

- Quality improvement: 2 or more courses, Project, Seminar, Talk, Single course
- Patient Safety: 2 or more courses, Project, Seminar, Talk, Single Course
- Leadership & IP Collaboration: 2 or more courses, Project, Seminar, Talk
- Systems Thinking: 2 or more courses, Single Course, Seminar, Project, Talk
- Health Economics: 2 or more courses, Single Course, Seminar, Talk, Not Taught, Project

For the QI, Safety, and Leadership / IP Collaboration competency domains, the two most frequent teaching modalities used were: two or more courses and projects, whereas for Systems Thinking and Health Economics the most common pedagogical methods were: single courses and two or more courses (Table 4).

On one side, all competency domains were more frequently taught in two or more courses. On the other side, four percent of program coordinators stated some aspects of the five competency domains listed in the survey were not part of their curricula. The average use of teaching modalities reported by program coordinators across the 5 competencies was: 2 or more courses (46%), project (15%), seminar (14%), single course (12%), talk (10%), and none (4%).

	QI	Safety	Leadership / IP Collaboration	Systems Thinking	Health Economics	Mean
Single Course	7%	2%	3%	20%	28%	12%
2 or more Courses	49%	55%	50%	43%	33%	46%
Project	18%	19%	19%	11%	8%	15%
Seminar	14%	13%	15%	15%	12%	14%
Talk	10%	10%	11%	8%	10%	10%
None	2%	1%	2%	3%	11%	4%
All Methods	98%	99%	98%	97%	90%	97%

Overall Assessment of Key Competency Domains

On a 5-point scale (from strongly agree to strongly disagree), respondents’ mean scores were between “neither” to “agree” for “the extent to which nursing programs comparable to mine, in general, address [the identified competency domains] nurses need to improve the US healthcare system” (Table 4). Scores ranged from a low of 2.96 (Health Economics / ADN programs) to a high of 4.0 (Quality and Safety / both BSN and ELM programs). Differences in scores among program types were not significant for the Quality and Safety domain. However, for Health Economics, the scores range (2.96—3.63) might suggest significant differences, especially between ADN and ELM programs.

	ADN	BSN	ELM	All Programs
Quality and Safety	3.98	4.00	4.00	3.99
Health Economics	2.96	3.16	3.63	3.08
1 = Strongly disagree, 2 = Disagree, 3 = Neither, 4 = Agree, 5 = Strongly Agree.				

Barriers to teaching Key Competencies in Nursing

Sixty-three (63) respondents answered the two free-text questions at the end of the survey: “list two of the most important barriers to teaching [the identified domain] in nursing programs?” Of these, 55 relevant responses were content-analyzed, yielding 13 themes. The frequency of these themes by program type and by competency domain is shown in Table 6.

Overall, for both Quality and Safety and Health Economics, the four most common themes were: Faculty Skills and Collaboration (22%), Curriculum Constraints / Saturation (17%), Time (17%), and Credentialing rules / School Leadership (11%). The frequency distribution of these themes by program type was:

- Faculty Skills and Collaboration: ELM (35%), ADN (19%), BSN (18%)
- Curriculum Constraints/Saturation: ADN (21%), ELM (18%), BSN (16%)
- Time: ADN (21%), BSN (16%), ELM (6%)
- Credentialing rules/School Leadership: BSN (24%), ELM (24%), ADN (3%)

For the Quality and Safety domain in particular, the fifth most common theme was:

- Access to Relevant Clinicals (9%): ADN (10%), BSN (8%), ELM (6%)

In the case of the Health Economics domain, the fifth and sixth most common themes were:

- Perceived as not relevant/Non-essential (8%): ADN (12%), ELM (6%), BSN (0%)
- Perceived as a new, high-level concept (5%): ADN (6%), ELM (6%), BSN (1%)

Table 6. Barriers to teaching Quality and Safety and Health Economics dedicated courses in Nursing

	Quality & Safety				Health Economics			
	ADN	BSN	ELM	All	ADN	BSN	ELM	All
Faculty Skills and Collaboration	19% (12)	18% (7)	35% (6)	21% (25)	16% (13)	32% (12)	29% (5)	22% (30)
Curriculum Constraints / Saturation	21% (13)	16% (6)	18% (3)	19% (22)	16% (13)	16% (6)	24% (4)	17% (23)
Time	21% (13)	16% (6)	6% (1)	17% (20)	20% (16)	11% (4)	24% (4)	17% (24)
Credentialing rules / School Leadership	3% (2)	24% (9)	24% (4)	13% (15)	9% (7)	18% (7)	6% (1)	11% (15)
Access to Relevant Clinical Experiences	10% (6)	8% (3)	6% (1)	9% (10)	1% (1)	- -	- -	1% (1)
Budget / Resources	5% (3)	3% (1)	- -	3% (4)	6% (5)	3% (1)	- -	4% (6)
Licensure / NCLEX required content	5% (3)	- -	- -	3% (3)	5% (4)	- -	- -	3% (4)
Healthcare System Complexity / Fluctuation	3% (2)	- -	- -	2% (2)	4% (3)	5% (2)	6% (1)	4% (6)
Limited IP Educational Opportunities	- -	5% (2)	- -	2% (2)	- -	- -	- -	- -
Students' General Education Preparation	2% (1)	3% (1)	- -	2% (2)	1% (1)	- -	- -	3% (4)
Lack of Academic-Clinical Partnerships	2% (1)	- -	- -	1% (1)	- -	11% (4)	- -	1% (2)
Perceived as a new, high-level concept	- -	- -	- -	- -	6% (5)	3% (1)	6% (1)	5% (7)
Perceived as not relevant / non essential	- -	- -	- -	- -	12% (10)	- -	6% (1)	8% (11)

Discussion

This study is the first report on competency level assessment for domains that go beyond quality and safety in all pre-licensure nursing curricula in California. In fact, no prior report has examined the extent for which health economics competencies have been incorporated in entry-level nursing programs.

According to the perspective of program coordinators and in direct contrast with the findings of a national study on new nurses perspectives of their education (Kovner et al., 2010), the overall results described here reflect a relatively high rate of competency in the following domains: Leadership and Inter-professional Collaboration, Patient Safety, Quality Improvement, and Systems Thinking across all nursing entry-level programs. In contrast, the domain of Health Economics was consistently cited as the competency with the lowest skill level and among the topics of lowest importance and/or relevance. This last finding is in direct conflict with the social imperative to improve the efficiency and curve the costs of healthcare.

In comparison with ADN and BSN programs, ELMs have the highest rate of competency in all the domains studied but Patient Safety. Similarly to what Sullivan, Hirst, & Cronenwett found in 2009, ADN programs had the highest rate of competency for the Patient Safety domain of all pre-licensure programs. Further, also in contrast with Kovner et al. (2010), the levels of competency shown in this report for ADN prepared nurses are relatively higher than BSN RNs in 4 out of the 5 domains studied (scores for Health Economics were the same for these two groups). However, it is not yet clear whether these results are biased or significant since advanced statistics were not employed to analyze the results.

Some program coordinators emphasize the need of practical strategies to redesign the nursing curricula to systematically thread QSEN competencies throughout their programs. The Delphi study conducted by Barton, Armstrong, Preheim, Gelman, and Andrus (2009) with QSEN experts and a latest study by Armstrong and Barton (2013) are a good start in the staggered integration of knowledge, skills, and attitudes (KSAs) at different phases of the curriculum—beginning, intermediate, advance. For example, these authors recommend an emphasis on individual patients early on with a shift to teams and systems later in the curriculum. Other health professions have recommended similar approaches to the longitudinal integration of competencies for undergraduate education (Mayer, Klamen, Gunderson, & Barach, 2009).

After more than a decade of extensive work by the QSEN experts to engage school leadership and prepare faculty members across the nation to integrate quality and safety competencies in pre-licensure nursing curricula, program coordinators in California still believe some of the major barriers to carve out space for these competencies are the lack of prepared faculty to teach them, poor leadership support for faculty to dedicate time to develop coursework, and antiquated credentialing rules that keep nursing curricula saturated with outdated content. The work described by Mundt, Clark, and Klemczak (2013) to transform nursing education for better patient care in Michigan can served as a model to create a coalition of policymakers, nurse educators and practice leaders to mandate the integration of QSEN competencies in all pre-licensure programs in California.

Similarly, increasing nursing students inter-disciplinary opportunities to learn about team strategies for improving quality and patient safety coupled with the implementation of just culture in academic settings, can be beneficial to the ultimate goal of achieving a safe and highly reliable healthcare system for all.

Limitations

It is unclear if the differences found among pre-licensure nursing programs in California in their preparation of entry-level nurses are significant as only descriptive statistics were used to analyze the results.

This study only takes into consideration the perspective of the academic program coordinators. Program coordinators, such as deans, directors, and chairs may be too far from the actual “curriculum in use” to accurately respond to this type of survey. Also, educators often lack exposure to the realities of practice and, thus, might not have had a way to comprehensively assess if their students are truly achieving the competencies in question. In order to have a more accurate assessment of these competencies and their potential link to patients’ health outcomes, both perspectives from: (A) nursing administrators, who are in charge of hiring and supervising new nurses, and (B) the students themselves, who are the recipients of the education and training, are needed.

Assessment of pre-licensure programs might have been inconsistent across all participants as some of the competencies / skills used in the survey were broadly written and overlapped with each other. Additionally, only some knowledge, skills and outcomes per competency domain were included in this study (Table 2). Assessments of attitudes were omitted. As demonstrated by the QSEN work, although they might be harder to assess, attitudes should also be assessed to have a better understanding of the extent in which new nurses learn and apply new knowledge.

The list of pedagogical methods was limited and failed to include contemporary and innovative modalities such as simulation, return demonstration, web-based learning, inter-professional learning, problem-based learning, and case studies.

Finally, although the sample might have been representative of pre-licensure programs in California, it might not be generalizable outside the region.

Conclusion

The multitude of players, rules, and economic factors involved in organizing and delivering healthcare in the US today requires a highly skilled workforce, who is prepared to act as change agents and continuously improve the systems in which they work. As a result, systematic changes must occur in the way new generations of nurses are educated. Early acquisition of quality and safety competencies, along with leadership and inter-professional collaboration, systems thinking, and health economics are essential for preparing the new nurses for the demands of their future jobs.

Although responses indicated relatively high levels of skill preparedness regarding quality and safety competencies, leadership and systems thinking, there were significant gaps in graduating students' health economics skills that can guide further efforts in pre-licensure nursing programs. Aside from being poorly incorporated in nursing curricula, Health Economics skills can be perceived as either high-level or non-essential by nursing educators. Research is needed to demonstrate the value or to make the business case for integrating health economics in entry-level nursing programs. As many barriers were identified for dedicating specific courses to teach quality and safety as well as health economics in pre-licensure nursing programs, future studies are needed to offer practical strategies to carve out space in the nursing curricula and progressively integrate these competencies throughout the different types of pre-licensure programs. A thorough examination of the relationship of this integration to verifiable performance outcomes should be rigorously studied.

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