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# Regulation of Simulation Use in United States Prelicensure Nursing Programs

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## KEYWORDS

simulation;  
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Nursing;  
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regulation

## Abstract

**Background:** Simulation usage has proliferated throughout nursing education. Although nursing programs have sought integration of simulation to substitute traditional clinical learning hours, the variability of regulations between states raises questions about consistency of learner outcomes.

**Methods:** The Boards of Nursing (BONs) of the United States and the District of Columbia were queried by internet, phone, and email to discover regulations and guidelines for the use of simulation in nursing education.

**Results:** More than half of the BONs reported regulations for simulation use, but they varied greatly. Some had regulations defining a percentage of traditional clinical hours that could be replaced with simulation. A few BONs specified an equivalent ratio of hours between simulation and clinical, but most did not. Some BONs described requirements for simulation instructors, but few provided specific criteria.

**Conclusions:** This search revealed great variability in how BONs are defining and regulating the use of simulation in prelicensure nursing education including the amount of traditional clinical hours that can be replaced with simulation. Because a description of measured learning that occurs during traditional clinical learning hours is lacking, inconsistency in regulation will persist.

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Simulation is advancing as an integral component of the preparation of nursing professionals and has been used

increasingly as an alternative teaching-learning method to traditional clinical experiences. Clinical situations can be replicated in a controlled environment using manikins, standardized patients, or virtual means, to allow participants to apply knowledge and skills without risk to patient safety. Within the United States, each state Board of Nursing (BON) is enacting legislation and rules to regulate the use of simulation in prelicensure nursing education. Because of the rapid rise of simulation usage, the International Nursing Association for Clinical Simulation and Learning (INACSL) Board of Directors formed a committee charged with compiling national and international regu-

lations and making it accessible online. This article describes the purpose, process, and findings of a search for simulation regulations within the United States.

### Key Points

- Simulation use has increased in nursing education programs, yet consistent regulatory guidelines are lacking.
- The individuality of state board of nursing regulation of traditional clinical education contributes to the variability of regulation of simulation within the United States.
- A description of measured learning in traditional clinical environments is needed if simulation is considered an equivalent replacement.

## Background

### Governance of Nursing Education Programs

Higher education within the United States is governed through a triad approach consisting of the U.S. Department of Education (USDE), state authorizing agencies, and accrediting organizations (United States Department of Education, 2019). It is the role of the USDE to ensure compliance with federal aid, collect higher education data, and enforce educational laws of privacy and civil rights. State authorizing agencies, which are state BONs, approve the initial operation of a degree-granting program and monitor adherence to state educational requirements (Spector, Hooper, Silvestre, & Qian, 2018). Accrediting organizations oversee the quality of programs within higher

education by establishing criteria for standards that must be met to demonstrate excellence.

The National Council of State Boards of Nursing (NCSBN), governed by a board of directors and the Delegate Assembly, advocates from a national level for the implementation of regulations that promote patient safety across the nation (NCSBN, 2018). A focus of the NCSBN is to protect the public by ensuring that nurses possess necessary knowledge and skills before entering practice through each state BON licensure processes. For graduates to be eligible to obtain nursing licensure, the program must be approved by the state BON and may require accreditation by a recognized accrediting body (NCSBN, 2018). A chief difference in purpose between the BON and an accreditor is that the mission of the BON is to protect the public, whereas the mission of an accreditor is to ensure continuous quality program improvement (Spector et al., 2018). Currently, there are two accreditors recognized by the USDE: The Accreditation Commission for Education in Nursing (ACEN, 2017) and the Commission on Collegiate Nursing Education (CCNE, 2017), whereas the National League for Nursing Commission for Nursing Education Accreditation (NLN CNEA, 2017) is a third organization currently seeking USDE recognition.

### Regulatory System of the State Boards of Nursing

The 10th Amendment of the U.S. Constitution stipulates that all forms of licensure are governed by a state-based regulatory system which allows for “individual state jurisdiction with its inevitable variations and uniqueness” (Poe, 2008, p. 268). As such, each BON is a unique governmental agency that enacts the state Nurse Practice Act and regulates the initial approval and ongoing regulation of nursing education programs. In the pursuit of ensuring public safety, each BON maintains jurisdiction to determine state-specific regulations for nursing programs to ensure that nurses demonstrate minimum competence for licensure to practice within an authorized scope (NCSBN, 2018). Because of each state’s individual jurisdiction, the legislative and governing process of enforcing the Nurse Practice Act and regulating nursing education programs varies between the BONs.

Each BON develops state-specific regulations for nursing programs that monitor the preparation of nurses who are competent to practice. Owing to the clinical nature of the nursing profession, these regulations include criteria for required clinical learning experiences, clinical instructor preparation, and student-to-faculty ratios in

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patient-care environments (Spector et al., 2018). The state BONs specify the settings in which these clinical learning experiences can take place including prehospital, inpatient, community centers and long-term care facilities. However, sites for appropriate learning opportunities are becoming increasingly limited across the nation because of escalating health care system constraints, staffing models, patient safety requirements, and a growing faculty shortage (Hayden, Smiley, & Gross, 2014b; Jeffries, Dreifuerst, Kardong-Edgren, & Hayden, 2015). Despite these limitations, each nursing program is required to provide clinical learning opportunities to ensure students are prepared for practice and remain compliant with the state regulations. One solution to meet this challenge is the use of simulation.

### Simulation as an Alternative Clinical Teaching-Learning Method

Simulation is one alternative method used increasingly for providing direct patient-care learning experiences across nursing education (Smiley, 2019). Simulation immerses learners in clinical situations that replicate reality, then a trained debriefer facilitates a reflective dialogue to help learners make meaning of the experience, acquire new knowledge, and apply this knowledge to future clinical situations (Adamson, 2015). Debriefing is the component of simulation that has been found to be most significant to learning (Shinnick, Woo, Horwich, & Steadman, 2011) because it facilitates the development of clinical reasoning (Dreifuerst, 2012; Forneris et al., 2015; Mariani, Cantrell, Meakim, Prieto, & Dreifuerst, 2013;) and improves teamwork, situational awareness, and skills necessary for nursing practice (Levett-Jones & Lapkin, 2014). However, as programs of nursing have sought to increase simulation use because of documented positive learning outcomes (Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014a; Adamson, 2015; Boling & Hardin-Pierce, 2016; Dreifuerst, 2012), each BON is confronted with developing specific guidelines that safeguard the integrity of this emerging alternative clinical learning environment as a replacement for traditional experiences (Spector et al., 2018).

As simulation usage has proliferated throughout nursing education, scrutiny of its use as an alternative learning experience has concurrently increased. This is further complicated by the individuality of state BON regulations. Although nursing programs have sought curricular integration of simulation to both supplement and substitute traditional clinical learning hours (Jeffries et al., 2015; Woda, Dreifuerst, & Garnier-Villarreal, 2019), the variability of permitted use within and between states (Bailey & Mixer, 2018) raises questions about the consistency of outcomes that learners can achieve. To that end, in 2009, the INACSL Board of Directors determined that standards of best practice for the use of simulation were necessary. Since the original seven Standards of Best Practice, Simulation<sup>SM</sup>, were

published in 2011, the standards have been updated twice using a review process based on new evidence, extensive literature reviews, and feedback from external reviewers (Sittner, 2016). There are currently eight Standards of Best Practice, Simulation<sup>SM</sup> (INACSL, 2016), which serve to guide best practice in the design, implementation, and evaluation of simulation activities. Although educators are seeking to align simulation curricula with the standards, there is little evidence describing programs' adherence because the standards are not regulations, but represent evidence-based practice.

The INACSL Standards of Best Practice: Simulation<sup>SM</sup> provide programs with a framework for implementing simulation pedagogy, yet faculty and administrators look to the BONs for clear regulatory guidance on the use of simulation as a form of clinical education. To understand the impact of simulation on new nursing graduates' readiness for practice, the NCSBN conducted a landmark multi-site longitudinal study, the National Simulation Study (NSS), which demonstrated that up to 50% of simulation can be effectively substituted for traditional clinical experiences in prelicensure programs with similar or better readiness for practice than new graduates who were prepared with traditional clinical experiences (Hayden et al., 2014a). After the dissemination of the NSS findings, an expert panel was convened by the NCSBN to develop national guidelines to assist state BONs in developing regulations for the use of simulation in prelicensure programs (Alexander et al., 2015). These guidelines specified that to effectively substitute simulation for traditional clinical experiences, the NSS methodology must be replicated which included high-quality scenarios facilitated by faculty formally trained in simulation and debriefing (Alexander et al., 2015; Jeffries, et al., 2015).

Because of the positive NSS findings (Hayden et al., 2014a), many programs of nursing sought to integrate more simulation within their curriculum, although not all used the standardized NSS approach. Since the NCSBN established simulation guidelines (Alexander et al., 2015), nursing programs held the expectation that BONs would establish consistent regulations for the use of simulation. However, the broad NCSBN recommendations (Alexander et al., 2015) did not have these results nor dispel the confusion about simulation integration because of the individuality and variability between the BONs.

### Regulation of Supervised Clinical Experiences

The NCSBN defines supervised clinical experiences as practical learning activities designed for students to apply nursing knowledge and skills in the direct care of patients under the supervision of an instructor who has met BON requirements (NCSBN, 2005). Because nurses are licensed to practice in all patient settings, programs must comply with BON requirements for providing both course content and clinical hours spent in supervised practical learning

experiences in a variety of patient settings (Spector et al., 2018). However, the NCSBN acknowledges that while there is evidence of the quality, there is little evidence of the quantity of hours of clinical learning experiences necessary for preparing competent nurses (Benner et al., 2010; Spector et al., 2018). Consequently, the NCSBN does not suggest a required number of hours, but merely states that “the number of hours should be comparable to clinical hours in similar programs” (Spector et al., 2018, p. 24). In an NCSBN survey (Smiley, 2019), the range of clinical hours across baccalaureate programs in 2017 was reported between 432 and 960 ( $n = 279$ ), whereas the hours in associate degree programs ranged from 270 to 855 ( $n = 294$ ). The NCSBN recognizes the legal jurisdiction of each state BON to determine minimum requirements for clinical hours. Yet, this wide variability of the acceptable number of hours is incongruent with “evidence-based regulatory excellence for patient safety and public protection” (NCSBN, 2019).

### Simulation Hours Substituted for Traditional Clinical Hours

With the increasing use of simulation, questions remain regarding how simulation hours are counted proportionately to traditional clinical hours. Specifically, as simulation use has accelerated, the unremitting question has been how many clinical hours each BON allows to be replaced with simulation (Hayden et al., 2014a; Smiley, 2019). Inherent in this question is the presumption that one hour of time in traditional clinical settings is equivalent to one hour in simulation despite little supporting evidence beyond the NSS (Hayden et al., 2014a). However, now there is also emerging evidence to support a ratio of two hours of time in traditional clinical settings as equivalent to one hour in simulation (Sullivan et al., 2019). Historically, 16 state BONs approved the use of simulation as a replacement for clinical hours in 2006 (Nehring, 2008). Twenty-two BONs allowed unspecified amounts of clinical replacement with simulation, whereas four states (CA, FL, VT, and VA) allowed up to 25% of traditional clinical hours to be replaced with simulation. At the same time, 21 BONs did not address the use of simulation (Hayden, Smiley, & Gross, 2014b). In the most recent NCSBN survey that assessed simulation usage in nursing education, 60.9% of respondents in RN programs ( $n = 852$ ) reported substituting some number of simulation hours for traditional clinical hours (Smiley, 2019), an increase from 48.5% in 2010 ( $n = 878$ ) (Hayden, Smiley, & Gross, 2014b). Moreover, Breymier, Rutherford-Hemming, Horsley, Smith, and Connor (2015) reported that 32% of the respondents in a survey of simulation usage indicated that their program used an equal ratio of simulation to clinical hours, which is consistent with the NSS 1-to-1 ratio. Just over half (55%) of the respondents indicated not using an equal ratio of simulation as a substitution, using 2-to-1 or 3-to-1 instead (Breymier et al., 2015). Yet, in the NCSBN survey, 82.9% of

respondents reported using a 1-to-1 ratio (Smiley, 2019), demonstrating confusion and inconsistency in reporting.

Nursing education has valued clinical learning experiences as an essential element for learning nursing practice, a tradition that was established decades ago as an apprenticeship-style of training. These practical experiences later evolved to university-based learning that remains the undisputed gold standard of achieving nursing competence (Ironside & McNelis, 2010). Practical clinical experiences are grounded on the assumption that the patient-care environment is the best platform for applying concepts learned in the classroom, thereby lessening the theory-practice gap (Hatzenbuehler & Klein, 2019; Ironside, McNelis, & Ebright, 2014), yet there is little evidence that supports this assumption. Moreover, there is little documentation describing the learner outcomes that occur during each hour of traditional clinical experiences, or the value of varying length of a clinical day (6, 8, 10, or 12 hours). Although the focus of the NSS was to investigate outcomes associated with varying percentages of simulation use, further examination of specific learning experiences in traditional clinical settings is needed if simulation continues to be substituted for it (McNelis et al., 2014). The absence of this description prevents efforts to define how to best measure substitution with any alternative teaching-learning method (Bowling, Cooper, Kellish, Kubin, & Smith, 2018; Ironside & McNelis, 2010).

Questions regarding substitution of required traditional clinical hours persist despite the lack of a description of what those hours should or do entail. Given the variety of simulation use that is prevalent in prelicensure nursing programs, there is a need to focus the attention of nurse educators, academic leaders, and BON members on the status of regulation and guidance for simulation. Therefore, the purpose of this article is to report the findings of a search of the U.S. BONs for regulatory guidelines of simulation usage and to offer recommendations for future regulatory efforts.

### Method

The BONs of the United States and the District of Columbia (DC) were queried by internet, phone, and email to discover documented regulations and guidelines for the use of simulation in nursing education. Initial inquiry began with an internet search of the website of each BON. If no documented regulations were readily available online, direct contact was made with the BON via phone or email. In addition, phone or email communication occurred with individuals identified as having a role in simulation education within that state.

Data collected included the following for each state: date of established simulation regulation; percent of clinical hours allowed to be replaced with simulation; ratio of simulation to clinical hours; definition of simulation; and simulation educator requirements. Only data that was

**Table 1** State Boards of Nursing Simulation Regulations

State	Established Simulation Regulations	Up to 50% Sub	Up to 30% Sub	Up to 25% Sub	Other Sub	No Defined Sub	Ratio of Simulation to Clinical	Definition of Simulation	Educator Requirements
AL	X					X			X
AK									
AZ	X					X		X	X
AR									
CA	X			X					
CO	X				X		1:1 or 1:2	X	X
CT									
DE									
DC	X		X					X	X
FL	X	X							
GA	X					X		X	
HI									
ID									
IL	X			X					
IN	X			X				X	
IA	X	X						X	
KS									
KY	X	X							X
LA	X	X						X	
ME									
MD									
MA									
MI	X				X			X	X
MN	X	X						X	X
MS	X			X			1:1	X	X
MO	X					X		X	X
MT									
NE									
NV	X			X				X	X
NH	X	X						X	
NJ									
NM	X	X						X	X
NY									
NC	X				X			X	X
ND									
OH	X				X			X	X
OK	X		X				1:1	X	X
OR									
PA									

*(continued on next page)*

Table 1 (continued)

State	Established Regulations	Up to 50% Sub	Up to 30% Sub	Up to 25% Sub	Other Sub	No Defined Sub	Ratio of Simulation to Clinical	Definition of Simulation	Educator Requirements
RI									
SC	X	X						X	X
SD	X	X						X	X
TN	X	X						X	X
TX	X	X						X	X
UT									
VT				X			1:1	X	X
VA	X		X	X				X	X
WA	X							X	X
WI	X	X						X	X
WV									X
WY									

documented and publicly accessible were collected and compiled into an excel spreadsheet using the exact BON wording to preserve data integrity. No anecdotal reports or survey data were collected.

## Results

### State Boards of Nursing with Established Simulation Regulations

Of the 50 states in the United States and the DC, 30 BONs had documented regulations for the use of simulation in a nursing program, whereas 21 BONs had no simulation regulations that could be located or officially verified (Table 1). Simulation was described and defined by 23 of the BONs with regulations, although seven BONs (AL, CA, FL, IL, KY, SD, and VA) did not provide a description of what qualifies as simulation although there were established regulations for its use in nursing programs.

### Clinical Hour Replacement with Simulation

Twenty-five BONs had documented regulations defining a percentage of clinical hours that could be replaced with simulation. Of these, 13 BONs allow up to 50% of the clinical hours to be replaced with simulation (FL, IA, KY, LA, MN, NH, NM, SC, SD, TN, TX, WA, and WI). Other state BONs allow for smaller percentages of replacement of clinical hours with simulation including 30% replacement ( $n = 2$ ; DC and OK), and 25% replacement ( $n = 7$ ; CA, IL, IN, MS, NV, VT, and VA). Four BONs identified regulations for the use of simulation but did not specify an exact allowable percentage of replacement (AL, GA, MO, and RI).

Three BONs specified a percentage range or other allowance for clinical hour replacement. The Colorado BON allows up to 50% replacement of traditional clinical hours with simulation if the program is accredited and up to 25% if the program is not. North Carolina allows no more than 25% in focused client care and no more than 50% in any other clinical experience; all simulation is limited to no more than 25% if a program is not accredited. Ohio allows up to 50% replacement with mid- or high-fidelity simulation in pediatrics and obstetrics only. The Michigan BON allows no more than 50% replacement for RN programs and up to 100% replacement with simulation in practical nursing programs for pediatrics and obstetrics courses only.

### Ratio of Simulation Hours to Clinical Hours

The search for simulation regulations included an investigation of the ratio of hours of simulation that are considered equivalent to hours of traditional clinical time. Three BONs specified that one hour in simulation should be counted as equal to one hour in the clinical environment (MS, OK, and VA). One BON allowed one hour of

simulation to be counted as either one or two hours of clinical time, if the nursing program was nationally accredited (CO). The remaining 25 BONs of the 30 with identified regulations did not define an equivalence ratio between simulation and clinical hours.

### Requirements for Simulation Educators

Twenty BONs described requirements for instructors who participate in simulation, whereas ten BONs did not. The requirements for preparing educators to facilitate simulation varied widely. Although some BONs referred to the INACSL Standards of Best Practice, Simulation<sup>SM</sup>, or the NCSBN guidelines as the criteria for preparing educators, many broadly stated that faculty need to be trained in the use of simulation. Common language was used across the BONs, including the need for documented and focused training, maintaining competencies in simulation and debriefing, and participating in ongoing professional development. Arizona identified the need for educators to be prepared to respond to “the psychological impact of simulation on students.” Overall, the BONs with requirements for preparing educators in simulation pedagogy broadly identified that educators must be adequately prepared and trained to use simulation. However, few states provided specific criteria for achieving or measuring this.

### Discussion

Given the individual state-based regulation of nursing licensure, the lack of consistency in guiding the use of simulation in nursing education is not surprising. The first challenge for nursing programs seeking guidance is accessing the BON regulations for their respective state. Anecdotal reports from educators were not always consistent with the data made publicly accessible by the BONs. Although some BONs had information readily available on their website, other websites were arduous to navigate, requiring reading meeting minutes to discern the consensus of the BON. Still other states' BON regulations were included on state licensure websites that included all licensures for that state. In addition, communication of new or updated regulations to nursing program administrators and faculty varied greatly between states. It was not clear how this communication was occurring and if there were clear processes in place for programs to verify regulatory changes. In fact, during this review process, a change in one state's regulations was inadvertently found on the state nursing association's website and not directly from an official BON source. In another case, a change in regulations was denied by the BON representative when in fact it had been published in their records for over a year.

The findings of this search revealed great variability in the percentage of simulation hours that BONs approve for replacing traditional clinical hours. In fact, only 12 states

require a minimum number of traditional clinical hours (NCSBN, 2019). This was not surprising, given that the number of required clinical hours also varies considerably by state. For regulatory bodies, this is perhaps the most common query with the most inconsistent response. Yet, this question is not easily answered because regulations often specify a percentage or a number of hours of clinical time can be substituted when in fact the state BONs must carefully consider several factors that impact such a decision, including the quality of the clinical experiences.

One factor that state BONs must consider in determining guidelines for clinical replacement is the number of traditional clinical hours required by each state BON. Each of the NSS sites required a minimum of 600 hours of traditional clinical experiences to be eligible to participate in the study (Alexander et al., 2015). Because the reported range of clinical hours in prelicensure nursing programs is as low as 270 and as high as 960 (Smiley, 2019), the vast difference between 50% of 270 hours and 50% of 960 hours is an important consideration. This also further complicates the concept of defining the substitution of simulation to clinical in ratios of hours of 1-to-1, 1-to-2, or 1-to-more.

Another aspect is that while the NSS demonstrated that up to 50% of clinical hours could be replaced with simulation, an often-overlooked contributing element to the positive outcomes achieved is the prescriptive methodology that was used. To anticipate similar results in education practice, the same methodology must be fully replicated, which includes the use of vetted scenarios, high-quality simulation, and a theory-based debriefing method (Alexander et al., 2015; Hayden et al., 2014a).

A third consideration is the necessary preparation of educators to facilitate simulation and debriefing. Training faculty to competently engage in simulation and debriefing was an important aspect of the NSS design that must be addressed to promote similar outcomes (Jeffries et al., 2015). Yet, the BONs did not consistently address requirements for training faculty in the pedagogy of simulation, and those that did were vague. Defining the type and dose of faculty training is critical to ensuring consistent learning outcomes (Bradley, 2019). Faculty who participated in the NSS not only received consistent and repeated training in implementing scenarios and facilitating debriefing but also they demonstrated competency before inclusion in the NSS and at regular intervals throughout the duration of the study. Competence assessment after training is indeed recommended in the literature that informed the INACSL Standards of Best Practice: Simulation<sup>SM</sup> (Bradley, 2019; Bradley & Dreifuerst, 2016). However, articulation of what that training should entail, valid instruments to assess competence, and a description of a competent level in simulation and debriefing skills are gravely lacking (Bradley & Dreifuerst, 2016). However, BONs have few resources to inform these types of regulatory decisions. Therefore, if BONs allow substitution of traditional clinical time with simulation, there is a risk that faculty in

nursing programs are not prepared to translate the NSS methodology into simulation (Jeffries et al., 2015).

A fourth factor for the state BONs to consider is whether substitution should be based on an hour-by-hour calculation. There is no evidence that describes what an hour of traditional clinical time should entail, much less that time spent in traditional clinical learning environments provides the most effective learning to prepare a future nurse (Ironside et al., 2014). In fact, research has demonstrated that during a traditional eight- or twelve-hour clinical experience, most students, if not all, had many missed learning opportunities and considerable downtime while they waited for the clinical instructor or the patient. This downtime occurred so often that neither faculty nor students were surprised by it (Ironside & McNelis, 2010; McNelis et al., 2014). Alternatively, in high-quality simulation, there is little downtime or missed opportunities. Intense learning is compressed into compacted timeframes with purposeful debriefing and articulated outcomes. This must be deliberated cautiously as state BONs address substitution percentages and ratios of time. With no evidence demonstrating the learning outcomes expected from one hour in traditional clinical settings, it is challenging to benchmark against it. Breymier et al (2015) noted that 14% of nursing programs surveyed relied on their BON to determine this hour substitution ratio, yet currently, most BONs with established simulation regulations fail to do so.

A final, yet overarching, issue that requires deep contemplation is a description of measured learning that occurs during traditional clinical learning hours within nursing education. If state BONs allow any amount of replacement of traditional clinical hours in nursing programs, it seems intuitive that they would be replaced with learning experiences that are equivalent in both quantity and quality. Clearly, the measurement of clinical experiences in hours is done for convenience and consistency, yet hours vary widely across nursing programs. This results in tension over the number of hours that can be considered equivalent. Furthermore, it is impossible to determine what qualifies as an equivalent learning experience when the literature lacks a description of traditional clinical time tied to specific, measured learning outcomes. In fact, there are few reports outlining the learning that occurs in traditional clinical experiences. The few documented descriptions of traditional clinical learning focus on finishing course assignments and completing assigned total patient care. This is a sharp contrast with outcomes related to decision-making, clinical reasoning, patient-care issues, delegation, or leadership skills (McNelis et al., 2014), which can be achieved in simulation (Hayden et al., 2014a). In the limited literature describing traditional clinical learning experiences, task completion of care routinely delegated to unlicensed staff in practice remains both a priority and a measure of progression for student nurses (Henderson, Cooke, Creedy, & Walker, 2012; McNelis et al., 2014). Other clinical outcomes include the number of hours spent in clinical practice environments and improved student-faculty ratios, neither of which

describe student learning outcomes (Ironside, McNelis, & Ebright, 2014). It is also important to note that although the difference was not statistically significant, the NSS control group of students who received no more than 10% of simulation scored lower on all standardized knowledge assessments through the duration of the study than the group receiving 50% of their clinical time in simulation (Hayden et al., 2014a).

## Conclusions

Clearly, the replacement of traditional clinical hours with simulation is accelerating across nursing education; inconsistent and unclear regulations are currently part of the landscape. To advance the science, a revisioning of what constitutes clinical learning is needed, to overcome the tension of comparing simulation and traditional experiences. Then, the discipline can embrace the value of clinical learning in all settings and focus on outcomes and quality experiences instead of hours. Further research is needed to determine how to best measure clinical learning to inform regulation and expand the evidence supporting teaching and learning in all settings, including simulation, to ensure nurses are well prepared to provide safe and quality care in a complex and dynamic health care environment.

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