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Featured Article

Emerging Evidence Toward a 2:1 Clinical to Simulation Ratio: A Study Comparing the Traditional Clinical and Simulation Settings

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simulation;
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Millers pyramid;
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Abstract
Background: There is limited evidence comparing the clinical and simulation environments.
Methods: This multicenter observational study compared traditional clinical to simulation on the type, number, and level of educational activities as determined by Miller's Pyramid.
Results: Forty-two students' experience revealed that skills, physical assessment, teaching, and critical thinking activities occurred more frequently in simulation, with safety interventions more common in clinical. In addition, in simulation, students performed a greater percentage of activities in higher levels of Millers Pyramid, "Knows How"; 12.8% as compared with 8.6% in clinical, and "Does"; 66.3% as compared with 46.2% in clinical. Notably, the activities in "Does" were completed in approximately 1/5 of the time in simulation; 440 minutes, as compared with clinical; 2,137 minutes.
Conclusion: The intensity and efficiency of simulation was demonstrated through the completion of more activities in higher levels of Millers Pyramid in significantly less time than clinical providing emerging evidence toward a 2:1 clinical to simulation ratio.

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The clinical experience has been previously perceived as the gold standard of experiential learning in medical surgical nursing education. It provides students with the opportunity

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to apply theoretical knowledge gained in the classroom in supervised clinical situations. It allows a student to combine knowledge gleaned from previous clinical, lecture, skills experiences, group projects, and simulations. An underlying assumption of the reliance on clinical hours is that with enough time in clinical, students will gain whatever skills and knowledge are necessary to safely care for a patient (Dunn, 2004). In reality, however, every student gets a unique experience, although the clinical rotation occurs with the same educators, at the same time and with the same curriculum (DeVita, 2009). Simulation provides a partial remedy to the randomness of the traditional clinical day by standardizing the learner patient encounter and/or experience. Despite a lack of empirical evidence, some nursing programs have adopted a 2:1 ratio of clinical to simulation hours because of the perceived intensity and workload involved in simulation for the student (Breymier et al., 2015). The purpose of this study was to answer the research questions: (a) What are the differences in the number and types of activities (including downtime activities) performed in the clinical and simulation setting? (b) What are the differences in the time spent in learning activities in the traditional clinical setting compared with the simulation setting?

Key Points

- In simulation, students independently complete more patient care activities at higher levels of functioning categorized via Miller's Pyramid in a shorter period of time than in the clinical setting.
- The data indicate weaknesses in the clinical experience namely a limited focus on the application of knowledge and critical thinking.
- The intense, efficient learning environment of simulation is emerging evidence toward a 2:1 clinical to simulation ratio.

Review of the Relevant Literature

Clinical

Educators believe that only experiential learning can yield the skilled knowledge required to safely function in complex and rapidly changing clinical situations; there is actually a "tenacious assumption that the student learns abstract information and then applies that information in practice" (Benner, Sutphen, Leonard & Day, 2010, p. 14). In fact, few studies have examined what really happens during the clinical rotation (Oermann, 2004). There is weak evidence supporting the effectiveness of traditional clinical education models (Jayasekara et al., 2018); traditional clinical has never been rigorously tested to determine its effectiveness (Gaba, 2004). Yonge (2005) found 39 studies about clinical education, but most of these studies relied on anecdotal reports or self-report survey information. Recent studies highlight misconceptions with clinical education. Ironside, McNelis, and Ebright (2014) noted that nurses place value on clinical education because they believe it presents students with opportunities to apply what is learned in the classroom, to expose students to various patient conditions, and to present students with opportunities to learn organization and prioritization skills. Yet, clinical settings vary, leading to nonstandardized inconsistent experiences for students (LeFlore, Anderson, Michael, Engle, & Anderson, 2007).

Papathanasiou, Tsaras, and Sarafis (2014) found noticeable gaps between expectations and realities of the clinical setting, demonstrating that students perceived their clinical learning environment to be highly focused on tasks. Similarly, direct observations of students and faculty in clinical revealed that faculty and student interactions focused mostly on task completion versus problem solving or critical/clinical reasoning in complex patient situations and that students spend a considerable amount of time (downtime) with tasks completed, standing around or looking for something to do (Ironside et al., 2014). Other themes of the clinical setting include "missed opportunities for learning, getting the work done as a measure of learning, failure to engage as a part of the team, and failure to enact situation-specific pedagogies to foster clinical learning" (McNelis, Ebright, Dreifuerst, & Zvonar, 2014, p.32). Pauly-O'Neill and Cooper (2013) identified gaps in quality and safety education competencies, finding that students in traditional clinical rotations spend little to no time engaged in quality improvement, evidence-based practice, or informatics. These revelations in conjunction with statements from organizations that nurses are not prepared to enter the clinical arena after graduation (Benner et al., 2010; Berkow, Virkstis, Stewart, & Conway, 2008) beg the question, "Are traditional clinical experiences providing students with the learning necessary for safe practice and optimal patient outcomes?" It also leads to a bigger question, "What can be done to make clinical courses more relevant to clinical nursing practice?"

Simulation

The National Council of State Boards of Nursing Simulation Study (Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014) demonstrated that simulation can effectively be substituted for traditional clinical experiences in prelicensure nursing education. A meta-analysis of eight studies by Cant and Cooper (2017) showed that simulation significantly improved clinical knowledge (CI 3.25-6.82) and a significant positive relationship between simulation performance and clinical performance exists ($r = 0.87$, $p < .001$) (Victor, Ruppert, & Ballasy, 2018). To date, only one study has quantitatively documented what occurs during a clinical experience compared with simulation. Pauly-O'Neill, Prion and Nyugen (2013) compared the time students were engaged in a traditional pediatric clinical to the time students were engaged in a pediatric simulation. They found more meaningful work occurred in the simulation setting compared with the traditional clinical setting. Gaining a better understanding of the clinical experience and how it compares to simulation is crucial. Findings from analyses of typical clinical and simulation days may provide support for alternative models of traditional clinical education (Ironside et al., 2014).

Theoretical Framework

The theoretical framework used in this study was Miller's Pyramid of Competence, commonly used in health care education (Miller, 1990). It is represented as a pyramid with stages to illustrate the process by which different learning competencies are acquired during the training period. The base of the pyramid, "*Knows or Knowledge,*" identifies what the student knows is necessary to perform effectively. The second level, "*Knows How,*" is an assessment of competence or the ability to learn and apply knowledge. "*Knows*" and "*Knows How*" reflect cognition. In the third level, "S*hows How,*" the student must demonstrate competence through performance in a supervised setting. The fourth level "D*oes*" is what the student does when functioning independently in the clinical setting. "*Shows How*" and "*Does*" reflect behaviors.

In this study, activities and discussions were categorized within Miller's Pyramid of Competence. "*Knows*" was defined as fact-gathering activities: looking through the chart, looking up meds, receiving report or preconference/postconference activities, and debriefing focused on direct recall. "*Knows How*" was application of "K*nows*" demonstrated via discussion of the plan of care with the instructor or health care provider, preconference/postconference activities, and debriefing focused on interpretation and application. "*Shows How*" were activities/skills and patient teaching completed with support or supervision. "*Does*" were activities/skills and patient teaching completed independently. Data were coded through Miller's Pyramid to determine the level or quality of the learning activity; "K*nows How*" being a higher level of cognitive activity than *"Knows"* and *"Does"* a higher level of behavior than *"Shows How"*.

Methods

From February 1, 2017 to December 1, 2017, this observational descriptive mixed method study of prelicensure nursing student activity in clinical and simulation was conducted during medical/surgical clinical nursing courses in three geographically diverse regions of the USA.

Sampling Approach on One Clinical Day During Week 3 and Week 7

A convenience sample of 63 students across three prelicensure programs participated in the study. Institutional review board and hospital approval were obtained as appropriate for all study sites. All students in the first or second medical-surgical—focused clinical course were eligible for the study. These courses offer similar types of clinical experiences and are generalizable to most prelicensure programs. Students were informed about the study during their clinical orientation and those who elected to participate provided informed consent. On the day of data collection, students were randomly chosen (simple randomization) for observation. A student was excluded if, on the day of observation, he/she was assigned a specialty experience (observation in a procedural area) or assigned to a high-risk nursing unit as these experiences were not generalizable. A study participant was only observed once, either in the simulation or clinical setting but not both. To keep the experience as natural as possible, neither the clinical faculty nor the students knew the date of data collection ahead of time.

Instrument/Protocol Development and Observer Training

Data Collection

A data collection tool and training video were developed to support consistent data collection for both clinical and simulation. All members of the research team watched the video and then recorded student actions on the tool from a videotaped simulation scenario. As a group, the training observation data and tool were reviewed and protocols determined for data collection.

Data Coding Guide

A coding guide was developed to determine student activity type and the Miller's Pyramid level with specific examples. Activity categories included medication administration, physical assessment, teaching, documentation, safety interventions, and communication. All categories were subcoded as independently performed or performed under supervision (including personnel type—instructor, nurse, provider). In addition, all data except those not directly associated with patient care (downtime, lunch/breaks, or gathering supplies) were assigned a Miller's category. The coding of the observational sessions was done four times. It was first done by the observer as quickly as possible after the observational experience. Second, the principal investigator (PI) and each observer reviewed the coding for each of their observations. Third, the PI and the research team member responsible for the database did a primary review of the coding from all the observations. With each review, refinements were made in determining the type of activity and, very importantly, the assigned Miller's code. A secondary review of all observational coding was done again by the PI and research team member responsible for the database to ensure that the data collection and coding protocols were consistently applied to all observations.

Data Collection Protocols

Clinical Day Protocol

On the clinical day, all activities performed by the student were recorded from the beginning to the end of the day including postconference. Time waiting for the instructor or nurse, or time spent engaged in activities not related to patient care (working on other school projects, standing around), was recorded and categorized as downtime.

Simulation Day Protocol

The structure of the simulation day at each site was unique. One used a six-hour simulation day where students were exposed to four different simulation scenarios. For others, it was three, two-hour sessions, all on separate days. To achieve consistency in simulation data collection, three discrete scenarios at each school per clinical course were observed. The students came to their simulation session in their clinical groups and all had the opportunity to be the RN during one scenario. Data were collected on students in the RN role. If students performed in the scenario as a pair, all activities performed by both were recorded as a single unit. All simulation scenarios were appropriate for the level of the course and the simulation objectives at all study sites included physical assessment, medication administration, teaching, Situation-Background-Assessment-Recommendation communication, and clinical intervention as appropriate. Trained faculty facilitated simulation activities in two of the sites. The third site used formally trained facilitators in addition to clinical faculty. Data were collected from the beginning to the end of the simulation experience including all prebrief and debrief activity. Simulation setup and breakdown were not observed. Time spent waiting to resolve operational/computer/manikin issues was recorded and categorized as downtime.

At the end of all simulation and clinical observations, participating students completed the Clinical Learning Environment Comparison Survey tool; a validated tool exploring the student's perceptions of the differences between the traditional clinical and simulation environments (Leighton, 2015) and a short qualitative survey about the observation experience. The Clinical Learning Environment Comparison Survey and qualitative data will be analyzed and presented separately.

Statistical Analysis

Data are expressed as absolute numbers with percentages. STATA, version 10 (Stata Corp, College Station, TX) was used for analysis of descriptive statistics. Data are presented in aggregate form and by individual site.

Results

Owing to differing academic schedules and timing of medical surgical classes, each study site observed a varied amount of both clinical and simulation sessions. There were also variations in the numbers of students in the classes and type of hospital and clinical unit (general medical/surgical floors including surgical, medical, and oncology specialties) used for data collection. Table 1 describes the observational experience by site. Over three semesters, 21 students were observed in the hospital clinical environment and 21 students (student pairs) were observed in the simulation setting. The typical clinical day of two study sites was an 8.5-hour day (7 a.m.-3:30 p.m.), whereas one site offered a 5.5-hour clinical rotation (7 a.m.-12:30 p.m.). At all sites, students were expected to provide total patient care for their clinical assignment; however, only 57% (12/21) of the students were assigned to give meds on the

Table 1 Overall Study Observations by Site

Observation Detail	Site 1		Site 2		Site 3	
# Sim observations	12		6		3	
# Clinical observations	15		4		2	
Hospital type	Academic		Community		Community	
Floor type	Medical/surgical Trauma/transplant Oncology		Medical/surgical Oncology		Medical/surgical Oncology	
Cohort size	140/84 (study observed 2 cohorts of students)		74		61	
Clinical group size	8-10		8-10		8-10	
Course observations	1	2	1	2	1	2
1 = Med/Surg 1 2 = Med/Surg 2	14	13	6	4	5	0

day of observation. The student patient ratio at all sites was similar with each student assigned to a minimum of one patient. Only five students observed in this study were assigned to care for two patients on the day of observation. To determine when most activities occurred during the clinical shift, all observations were recorded in real time. Most activities occurred between 7 a.m. and 11 a.m., which corresponded to the general routine of a hospitalized patient when morning care, assessments, vital signs, and medication administration occur. Simulation observations occurred at the simulation center of each study site. Sixty-six percent (14/21) of the simulations were manikin based and the remainder used trained simulated patients. Figure 1 illustrates the observations; number of activities, hours observed, and subsequent numbers of Miller's codes.

Activities Coding

Table 2 provides the detail of student activities in the simulation and clinical environment. Of note, in simulation, students typically performed more activities in shorter time frames compared with clinical. Examples include physical assessment, skills, and medication administration. Other notable differences include increased patient teaching activities and an increased frequency of prebriefing and debriefing activities in simulation. More time was spent in chart review, documentation, and patient care rounds in clinical (see Table 2).

Miller's Pyramid Coding

All activities that had a direct impact on patient care were assigned a Miller's Code. Of the 1,917 activities observed, 1,658 qualified for a Miller's Code; 366 in simulation and 1,292 in clinical. Figure 2 demonstrates the aggregate compilation of activities in each Millers category separated by simulation vs. clinical. Of note are the categories of "*Knows How*" and *"Does."* Students in simulation

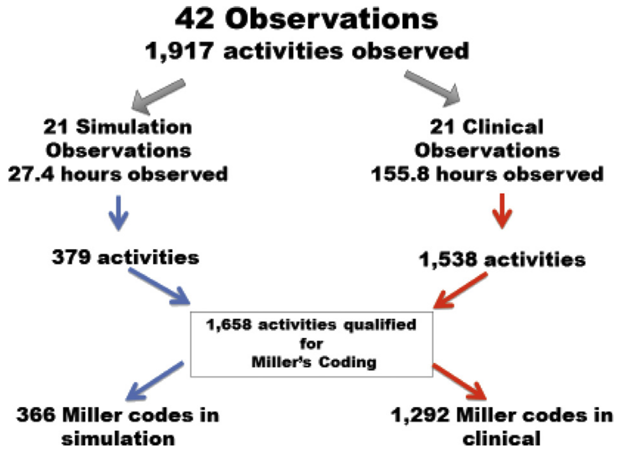

Figure 1 Schematic of observation activities and Miller codes.

performed more time in the "*Knows How*" category (12.8% activities in 809 minutes vs. 8.6% activities in 762 minutes) in the clinical setting. Although students functioned independently ("*Does*") in both settings, 66.3% of activities occurred in only 440 minutes in simulation compared with 46% of activities in 2,137 minutes in clinical.

Downtime was defined as time not engaged in patient care activities. Of note, 9.7% of all activities observed in the clinical setting were categorized as downtime. This included time waiting for the clinical instructor or RN, using clinical time to complete school assignments, and general downtime defined as socializing with other students or "standing around doing nothing." Only one site of the three recorded student downtime in simulation, which lasted 9 minutes. This included time spent waiting to resolve operational, computer, or manikin issues.

Discussion

Activities: Simulation Versus Clinical

When examining activities, most differences can be explained by the nature of the two environments. In simulation, students function independently in the role of the nurse with specific objectives in each scenario; therefore, the percentage of activities observed corresponds to a directed and focused experience. There were more physical assessments, skill activities, and teaching in simulation than in clinical. Physical assessment and skills may be due to the scripted nature of the scenario session. Students are expected to minimally do one set of vital signs and a focused assessment in each scenario and, as the scenario evolves, repeat assessments may be required. In clinical, assessments are a part of the clinical day, but there may only be one assessment completed at the beginning of the shift. Surprisingly in this study, observed students did not routinely complete a focused physical assessment on their assigned patients.

The increased number of skill interventions in simulation may also be a component of the scripted simulation environment as skills are built into the scenarios. The increased number of teaching activities may be due to repeated teaching of the patient as the simulation evolves; students update the patient about what is happening and what the plan of care is as changes are occurring. The limited teaching in clinical is unexpected and unfortunate but may be a function of the availability of family members or the late time of patient discharge; discharge teaching may be delayed until later in the day when most clinical learning time is over. In the clinical environment, most activities completed were safety interventions, for example, washing hands and identifying the patient with fewer safety interventions in simulation. One explanation for this could be that students do not enter and exit the patient room

Table 2 General Categories of Activities: Simulation vs. Clinical

Activity	Simulation: # Activities Observed in Sim N = 379 (%)	Simulation: # Minutes Recorded N = 1,646 Minutes (% Time)	Clinical: # Activities Observed in Clinical N = 1,538 (%)	Clinical: # Minutes Recorded N = 9,024 Minutes (% Time)
Chart review/information gathering*	65 (17.1%)	112 (6.8%)	299 (19.4%)	1,759 (19.4%)
Physical assessment	53 (13.9%)	55 (3.3%)	120 (7.8%)	500 (5.5%)
Skills	30 (7.9%)	17 (1%)	50 (3.2%)	238 (2.6%)
Medication administration	49 (12.9%)	34 (2%)	167 (10.8%)	966 (10.7%)
Activities of daily living	1 (<1%)	NR	65 (4%)	238 (2.6%)
Safety interventions	46 (12.1%)	230 (13.9%)	333 (21.6%)	639 (7%)
Documentation	0	0	100 (6.5%)	622 (6.8%)
Gathering supplies	7 (1.8%)	2 (<1%)	63 (4%)	154 (1.7%)
Teaching	57 (15%)	145 (8.8%)	101 (6.5%)	605 (6.7%)
Patient care rounds	N/A	N/A	33 (2.1%)	202 (2.2%)
Prebriefing/debriefing/postconference	68 (17.9%)	1,042 (63.3%)	32 (2%)	872 (9.6%)
Lunch	N/A	N/A	24 (1.5%)	892 (9.8%)
Downtime				
Standing around	3 (<1%)	9 (<1%)	63 (4%)	604 (6.6%)
Waiting for nurse	N/A	N/A	21 (1.3%)	101 (1.1%)
Waiting for clinical instructor	N/A	N/A	39 (2.5%)	322 (3.5%)
Working on school assignment	N/A	N/A	27 (1.7%)	310 (3.4%)
Total Downtime	3 (<1%)	9 (<1%)	150 (9.7%)	1,337 (14.6%)

Note. NR = Not recorded; N/A = not applicable.
* Onsite preparation for simulation and clinical.

multiple times during a simulation scenario. Over the course of the day in the clinical environment, students repeatedly enter and exit the patient's room. As might be expected, more time was spent documenting in clinical as charting practice is typically not the focus of a simulation. In addition, students spent more time in chart review in clinical. This may be due simply to the relatively short encounter in simulation as opposed to the longer clinical day.

The important distinction to note when examining activities is the difference in percentage of time spent doing the described activities; the percentage of time spent doing the same number or more activities in simulation was less than that in clinical. For instance, physical assessment accounted for 13.9% of the activities in simulation completed in 3.3% of the time as compared with 7.8% of the activities in clinical completed in 5.5% of the time. In this way, simulation appears to be a more concentrated and efficient teaching methodology compared with traditional clinical.

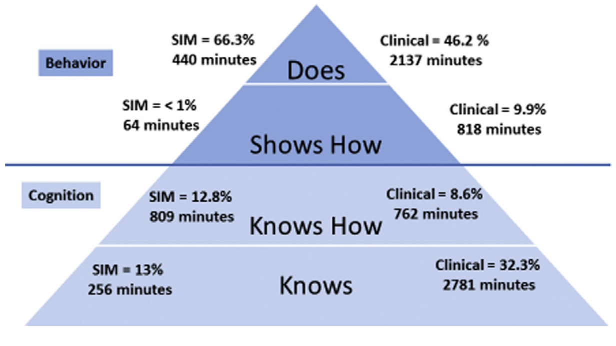

Figure 2 Percent simulation and clinical activities and time spent in minutes applied to Miller's Pyramid.

Millers: Simulation Versus Clinical

Comparing the Miller's coding reveals striking differences between simulation and clinical. In clinical, students spend 42% of their time in Miller's *"Knows"* such as clinical fact gathering, looking through charts, and looking up medications. This also reflects clinical discussions with faculty or the unit nurse that focus on direct recall such as "what medications is your patient on today." This mirrors the earlier work of Ironside et al. (2014) that found a focus on task completion versus critical/clinical reasoning in clinical. In simulation, only 16% of a student's time is spent in *"Knows."* Beyond the limited focus of faculty discussion, one explanation for the increased time in *"Knows"* in clinical may be the potential for change throughout the day requiring frequent review of the chart. In simulation, the students review the patient material once they begin care.

In simulation, students spent 51% of their time in Miller's *"Knows How"* compared with 12% of the time in the clinical setting. This reflects the level of discussion with the clinical instructor and/or unit nurse and the number and type of discussions in the postconference or debriefing sessions. The decreased number of preconference/postconference activities in clinical and their focus on recall, not application, is of concern. This represents a lost opportunity for critical thinking related to the patient experience (Ironside, et al., 2014; Benner et al., 2010). Discussions in simulation debriefing were a higher level application discussion; students were guided through reflective debriefing in which critical thinking and application of knowledge is inherent.

Not surprisingly, students spent 9.9% of time in clinical completing activities with support, *"Shows How*," as compared to <1% of time in simulation. This is inherent in the clinical environment because the activities performed with and on patients are potentially lethal. This is not the case and is, in fact, the point of simulation. In simulation, students are "the nurse" and can practice independently in a safe space.

Miller's category of *"Does"* again reflected the student's ability to function independently in simulation. Students in simulation performed 66% of activities in "*Does*" compared with 46% of activities in the clinical setting. The percentage of time completing those activities is lower; 28% in simulation vs. 33% in clinical. This reflects a more intense and efficient learning environment.

Downtime

Our findings mirrored the earlier work of Pauly-O'Neill, Prion and Nyugen (2013) and Ironside et al. (2014). Downtime activities accounted for 14.6% (1,337 minutes) of clinical time and less than 1% (9 minutes) of the time in simulation. Clinical is subject to the randomness of the day and patient activity scheduling. There is no control over what will happen (or not) on any given day. It is also greatly impacted by the instructor to student ratio. Time can be spent waiting on the clinical instructor who is working with other students. The structure of a simulation day precludes downtime by the very nature of its structure; time is not wasted with students performing nonpatient care activities.

Observational Experience in Simulation

As the goal of this study was comparing activities, we did not collect data on students "observing" the simulation scenario, but we recognize that the observer role in simulation has tremendous value as it is considered active learning. Unlike traditional clinical experiences where students have periods of downtime, simulation allows learners to be immersed continually in clinical learning especially when the observer group uses a tool to guide the observation (O'Regan, 2016). Stegmann, Pilz, Siebeck, and Fischer (2012) reported higher learning outcomes in the group of learners who were observing the simulation compared with the group who were actively participating. Similar studies have found no difference in outcomes between learners assigned to the hands-on role versus learners assigned to the observer role (Bell, Pascucci, Fancy, Coleman, & Zurakowski, 2014; Hober & Bonnel, 2014; Kaplan, Abraham, & Gary, 2012; Thidemann & Soderhamn, 2013). When queried, learners reported that participating as an observer was a meaningful experience, which allowed them to conceptualize the learning experience, capture the big picture, and connect with the team (Hober & Bonnel, 2014). Some learners in the observation role stated they learn more by watching others than being in the active role (Harder, Ross, & Paul, 2013).

Clinical to Simulation Ratio

The data clearly demonstrate the intense, efficient learning environment of simulation allowing us to begin to define a clinical to simulation ratio. When evaluating the activities data, students completed more activities in less time in simulation. In addition, important, students had a greater percentage of activities and spent more time in *"Knows how*," indicating a greater focus on critical/clinical reasoning in simulation as compared with clinical. The data that begins to suggest a 2:1 clinical to simulation ratio the clearest is Miller's category of *"Does*." Students completed a greater percentage of activities independently in approximately 1/5 of the time in simulation; 66.3% in 440 minutes as compared with clinical; 46.2% in 2,137 minutes.

Collecting and coding data on students in the observer role would have some impact on the Miller's data and thus the clinical to simulation ratio. Based on our experience observing and coding simulation data, observing the actual simulation scenario would be considered active learning time, and time gathering data, therefore, would be coded as *"Knows*." Considering, on average, a 10 to 20 minutes scenario, there would be a slight increase in the minutes and percentage of *"Knows*." In addition, importantly, there would be a significant increase in the percentage of *"Knows How"* as, if the trend was consistent as in our observations, the prebrief and debrief would be application of knowledge and coded *"Knows How*."

Limitations

The limitations of this study are those inherent in observational field research. The observed experiences were not standardized. The clinical and simulation experience was different at each school. The clinical days were of differing lengths and times, and the simulation scenarios were not consistent across sites. In addition, the clinical and simulation faculty had differing levels of training.

Conclusion

This was an observational study describing in detail the activities of the clinical and simulation learning environments of three diverse prelicensure nursing programs. There was no manipulation of either experience; the observations were done in each setting ‘‘as is’’ as such no two clinical or simulation observations were completely alike and each student’s experience was unique. The intense, efficient learning environment of simulation is demonstrated through the efficiency of time spent in patient activities, the time spent in critical thinking, and the time spent in independent activity. In simulation, students independently complete more patient care activities at higher levels of functioning in 1/5 of the time than in the clinical setting providing emerging evidence toward a 2:1 ratio of clinical to simulation time. This study also highlights weaknesses in the clinical experience that can be improved, namely the limited focus on the application of knowledge and critical thinking and the inefficiency of student time spent in the clinical setting. In addition, observations revealed that the most active hours of the clinical day are 7 a.m.-11a.m., which could have implications on the length and structure of the clinical experience. This study was a starting point, beginning to reveal evidence of the intense, efficient learning environment of simulation. Additional studies validating these findings are necessary to further clarify the differences in the simulation and clinical environments with the goal to better inform/ define the optimal student clinical learning experience.

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