Nursing Faculty Use of High-Fidelity Human Patient Simulation in Undergraduate Nursing Education: A Mixed-Methods Study

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ABSTRACT

High-fidelity human patient simulation (HFHPS) is an innovative teaching tool. However, limited data exist regarding factors affecting faculty use of HFHPS in undergraduate nursing education. Using a convergent, parallel, mixed-methods design, predictors of undergraduate faculty (N = 139) use of HFHPS were explored. Data were collected using a Web-based survey. Results indicated a high percentage of HFHPS use in nursing programs but a low percentage of HFHPs substituting for traditional clinical hours. Faculty who substituted clinical hours with HFHPS had lower self-efficacy beliefs around HFHPS than other faculty surveyed. Qualitative data supported the quantitative findings, including themes that HFHPS provided a safe environment for learning, but it was a mixed result. Results support that nursing faculty’s beliefs about HFHPS were strongly associated with HFHPS use. Specifically, self-efficacy beliefs and further exploration of the meaning of a safe environment for student learning should be addressed in future studies. [J Nurs Educ. 2014;53(3):142-150.]

Nurse educators began using high-fidelity human patient simulators approximately 15 years ago to augment instruction within graduate nursing anesthesia programs (Nehring & Lashley, 2004). Subsequently, the use of high-fidelity human patient simulation (HFHPS) as a teaching method has become commonplace in undergraduate nursing programs. This expansion has been attributed to a growing awareness of HFHPS capabilities and the importance of experiential learning opportunities for students (Akhtar-Danesh, Baxter, Valaitis, Stanyon, & Sproul, 2009; Kardong-Edgren, Starkweather, & Ward, 2008; Valler-Jones, Meechan, & Jones, 2011).

The availability of clinical sites where students can complete traditional clinical hours has been declining due to competition among nursing schools for these sites and the more restrictive policies about the number of trainees permitted within these health care organizations (Feingold, Calaluce, & Kallen, 2004; Nehring, 2008). Consequently, HFHPS has been proposed as substitute for traditional clinical hours, with certain boards of nursing permitting the substitution of HFHPS hours for clinical hours (Akhtar-Danesh et al., 2009; Nehring, 2008). The use of HFHPS experiences to achieve clinical learning is consistent with the National League for Nursing’s (2005) core competencies, which included the implementation of advanced technologies for the support of the teaching–learning process.

Despite the increased use of HFHPS, faculty have expressed mixed views regarding the integration of HFHPS into an established curriculum (Jones & Hegge, 2007; Kardong-Edgren et al., 2008). Although evidence suggests that HFHPS is pedagogically sound and leads to positive learning outcomes, faculty report reluctance to use HFHPS in undergraduate nursing education, especially to supplement or replace traditional clinical hours (Cant & Cooper, 2009; Elfrink, Kirkpatrick, Nininger, & Schubert, 2010; Feingold et al., 2004; Fountain & Alfred, 2009; King, Hindenlang, Moseley, & Kuritz, 2008).

The current research focuses on undergraduate nursing faculty with access to functioning HFHPS. Using Creswell’s and Plano Clark’s (2011) convergent parallel design, the purpose of this study was to investigate teacher factors, student factors, and educational practices as outcome predictors of undergraduate nursing faculty use of HFHPS.
The following research questions were addressed:

- Quantitative Research Question 1. Are teacher factors (comfort level with implementing HFHPS in the nursing program, faculty age, self-efficacy about achieving student outcomes with HFHPS, confidence in HFHPS teaching skills, perception of the quality and availability of existing clinical sites), student factors (type of undergraduate nursing program, student readiness for HFHPS learning), and educational practices (presence of a HFHPS skills laboratory coordinator, student-to-faculty ratio during the HFHPS experience) predictors of faculty use of HFHPS as a substitute for traditional clinical hours?
- Qualitative Research Question 2. What are faculty experiences in using HFHPS?
- Mixed Methods Research Question 3. In what ways do the quantitative and qualitative findings converge?

**LITERATURE REVIEW**

The availability of HFHPS scenarios across different patient populations and complexity of patient care situations has expanded the potential for use of HFHPS within nursing curricula. Studies exploring faculty use appeared in the nursing literature as early as 2001 when Nehring, Ellis, and Lashley described the uses of HFHPS in one undergraduate nursing program. Their study produced anecdotal evidence for the wide variety of faculty uses for HFHPS, including the instruction of pathophysiology, pharmacology, physical assessment, patient safety, physiology, basic nursing skills, and student evaluation of knowledge retention and skill attainment (Nehring et al., 2001). By 2004, faculty uses of HFHPS had expanded and were reported within introductory level, as well as advanced, medical-surgical nursing courses (Nehring & Lashley, 2004). Similar descriptive studies reported the use of HFHPS by nursing faculty for the instruction of patient safety, interprofessional communication skills, patient and family interactions, physical assessment and basic nursing skills, advanced cardiac life support, professional issues, and critical care, obstetrical, pediatric, gerontological, mental health, community, and public health nursing (Adamson, 2010; Hayden, 2010; Mould, White, & Gallagher, 2011; Reising, Carr, Shea, & King, 2011; Starkweather & Kardong-Edgren, 2008).

Although the use of HFHPS within courses is occurring, data regarding the actual time spent using HFHPS within nursing curricula are scarce and almost a decade old. Nehring and Lashley (2004) conducted a survey of 34 schools of nursing and HFHPS centers in 2002. HFHPS use, as measured by clock hours, was reported to be the highest in the advanced medical-surgical courses of associate degree (ADN) nursing programs, with a mean of 11.18 (SD = 10.2) hours. Bachelor of Science in Nursing (BSN) programs reported the greatest use of HFHPS in basic skills courses, with a mean of 3.77 (SD = 10.96) hours. Slightly more than half (57.1%) of the programs surveyed counted the clock hours spent in HFHPS toward the clinical hour requirements within the curriculum. No other studies were found that described or documented use within nursing curricula.

The predictors of faculty use of HFHPS have not been systematically examined. It has been reported that faculty are drawn to the possibilities of HFHPS, yet they are frightened of the new technology (Akhtar-Danesh et al., 2009; Jones & Hegge, 2007; Nehring & Lashley, 2004). Kardong-Edgren et al. (2008) summarized the problem of underutilization of HFHPS occurring within an environment of digital immigrants (today’s aging faculty), who may be reluctant to embrace new technology by working with digital natives (students who have grown up in the digital age).

To date, there has been a noticeable lack of systematic quantitative research in the nursing literature focusing on faculty factors affecting HFHPS use. Research has primarily focused on students’ experiences with HFHPS, which include positive learning outcomes (Cant & Cooper, 2009; Corbridge et al., 2008; Curtin & Dupuis, 2008; Elfrink et al., 2010; Feingold et al., 2004; Heitz, Brown, Johnson, & Fitch, 2009; Morgan, Cleave-Hogg, DeSousa, & Lam-McCulloch, 2006; Smith & Roehrs, 2009; Starkweather & Kardong-Edgren, 2008), increased confidence (Alinier, Hunt, Gordon, & Harwood, 2006; Brenner, Audiddell, Bennett, & VanGeest, 2006; Cant & Cooper, 2009; Corbridge et al., 2008; Curtin & Dupuis, 2008; Feingold et al., 2004; Smith & Roehrs, 2009), and the ability to think critically (Bond & Spillane, 2002; Cant & Cooper, 2009; Norris, 2008). Research that focused on the faculty perspective primarily explored perceptions of increased cost, resources, and time required to teach with HFHPS (Adamson, 2010; Akhtar-Danesh et al., 2009; Feingold et al., 2004; Jansen, Johnson, Larson, Berry, & Brenner, 2009; Nehring & Lashley, 2004). Fear of technology inherently associated with HFHPS has been documented (Kardong-Edgren et al., 2008; Nehring & Lashley, 2004). However, no studies were found in the literature that comprehensively studied use of HFHPS from the nursing faculty perspective. In addition, the research has been largely atheoretical, and studies are needed that have a theoretical basis to systematically contribute to the science underlying this pedagogy.

Given these literature gaps, a convergent parallel design was used to examine theory-based factors influencing HFHPS use among undergraduate nursing faculty. The conceptual basis for the study was the Nursing Education Simulation Framework, which proposes that interplay among faculty and teacher factors, student factors, and educational practices influences the outcomes of the HFHPS experience, including its use and faculty satisfaction (Jeffries & Rogers, 2007). The exploration of these factors allowed for the examination and consideration of how they may impact further integration of HFHPS into undergraduate nursing curricula.

**METHOD**

**Design**

A mixed-methods, convergent parallel design was used. The convergent parallel design is a one-phase mixed-methods design that is used when a researcher desires to directly evaluate and compare quantitative and qualitative results (Creswell & Plano Clark, 2011; Teddlie & Tashakkori, 2009). This design was appropriate, as there is limited research that focuses on faculty factors affecting the use of HFHPS in undergraduate nursing education. This research design triangulated and validated
quantitative findings with supplemental and valuable qualitative data. All data were obtained via Zoomerang®, a Web-based data collection application.

**Setting and Sample**

The convenience sample consisted of 139 undergraduate nursing faculty teaching in the United States. To participate in the study, faculty had to (a) be an RN, (b) have access to functional HFHPS equipment (defined as an HFHPS that functions sufficiently in a scenario to provide realistic physiological and pharmacological responses to student and faculty interventions), (c) have taught in an undergraduate nursing course with a clinical component within the previous 12 months, and (d) be employed full time or part time as nursing faculty. Exclusion criteria included faculty working as a coordinator of an HFHPS skills laboratory or learning resource center.

**Instruments and Measures**

**Demographic Data Form.** Participants completed a series of questions about age, gender, race and ethnicity, years of experience as nursing faculty, highest level of education completed, and employment status. Participants also provided data regarding their work environment, including type of undergraduate nursing program and primary course taught in the program.

**Clinical Site Scale.** The Clinical Site Scale was an investigator-developed (A.H.D.) scale that was used to measure faculty perceptions of the quality and availability of existing traditional clinical sites within their nursing program. This was a four-item scale, with a possible score of 4 to 20, where participants indicated on a 5-point Likert scale how much they agreed or disagreed with each statement. Higher scores indicated more positive faculty perceptions of existing traditional clinical sites. Content validity evidence was obtained, with a review by two experts (L.P.K., S.S.G.) in nursing education and methodology and psychometrics. Cronbach’s alpha for the study was 0.74.

**Student Readiness for Simulation Learning Scale.** The Student Readiness for Simulation Learning Scale was an investigator-developed (A.H.D.) scale that was used to measure faculty perceptions of student readiness for active participation in a simulation learning experience. This was a one-item Likert scale with a possible score of 0 to 10. Higher scores indicated more positive faculty perceptions of student readiness for simulation learning. Evidence for content validity was established with the same experts described previously.

**Comfort Levels Scale.** Faculty comfort with using HFHPS was measured with subscale C of the Comfort Levels Using High-Fidelity Simulation instrument developed by Jones and Hegge (2007). The subscale includes 12 items based on a 5-point Likert scale, ranging from 1 (no comfort) to 5 (total comfort). Items measured faculty comfort using HFHPS throughout the curriculum and how HFHPS promoted active learning and student interaction. Acceptable reliability and validity data have been reported (Jones & Hegge, 2007). Possible scores ranged from 12 to 60, with higher scores indicating greater comfort. Cronbach’s alpha in this sample was 0.94.

**Modified Teacher’s Sense of Efficacy Scale.** HFHPS teaching skills self-efficacy was measured with the 12-item Modified Teacher’s Sense of Efficacy Scale, which is a reliable and valid instrument developed by Tschannen-Moran and Hoy (2001). The instrument was modified slightly to measure self-efficacy with teaching HFHPS by including pertinent terminology with the permission of Dr. Anita Hoy. The focus of this instrument was on self-efficacy beliefs about achieving student outcomes during HFHPS, including motivating students and helping them value HFHPS. The instrument uses a 9-point Likert scale format, ranging from 1 (nothing) to 9 (a great deal). Possible scores ranged from 12 to 108, with higher scores indicating a greater sense of self-efficacy with teaching with HFHPS. In this sample, Cronbach’s alpha was 0.89.

**Modified Teacher Confidence Scale.** An adapted version of the reliable and valid Teaching Confidence Scale (Hoy, 2000) was used to measure faculty teaching skills confidence with HFHPS. With the permission of Dr. Anita Hoy, minor modifications to the wording of this instrument were made so that it reflected HFHPS teaching skills confidence. The items of this questionnaire primarily focused on confidence in HFHPS teaching skills, such as locating resources and assessing learner needs. The 32-item instrument used a 6-point Likert scale, ranging from 1 (disagree) to 6 (agree). Higher scores indicated greater confidence, with a possible range of 32 to 192. Cronbach’s alpha in this sample was 0.96.

**Simulation Use.** Participants were asked to indicate a target clinical course in which they were course faculty. Within the course, they indicated the number of required clinical hours and the number of hours spent in HFHPS activities. On the basis of these data, a percentage of clinical hours spent in HFHPS was calculated.

**Qualitative Data.** To address the qualitative research question, data were obtained using one open-ended survey item: “Tell me of your experience in using high-fidelity human patient simulation.” Participants typed their response to this item within a text window in Zoomerang.

**Procedures**

Following approval by the institutional review board, recruitment procedures proceeded for the study. Nursing faculty were recruited through two Web-based nursing education electronic mailing lists. One focused on general nursing education and the other focused on nursing faculty with an interest in HFHPS. An informational e-mail was distributed to addresses from the electronic mailing lists, detailing the research project and providing an active Web link to access study forms.

All study materials, including the informed consent and study questionnaires, were converted into an online survey via an active Web link within Zoomerang. Faculty interested in participating in the study clicked on the active link in the informational e-mail that directed them to the survey site. When the active link was clicked, the individual was presented with the informed consent within Zoomerang and then subsequently progressed to the survey items. The Web-based survey took approximately 30 minutes to complete. Recruitment and data collection occurred over a 4-week period in 2012.

All research data obtained from Zoomerang were held on a fire-walled, password-protected information technology server and then were exported into Microsoft® Excel. The Excel data were imported into the SPSS® version 17.0 software. Text data
Overview of Data Analyses
Quantitative data were imported into the SPSS software, and data cleaning was conducted. All interval and ratio data were examined for normality. Data were analyzed using descriptive statistics, chi-square analysis, and the Kruskal-Wallis test, which is a nonparametric equivalent of one-way analysis of variance. Prior to conducting specific data analyses, statistical assumptions were assessed. For all statistical analyses, the level of significance was $p < 0.05$ using two-tailed tests.

To analyze the qualitative narrative data, text responses for the open-ended item were downloaded verbatim from Excel into Microsoft Word. A paper copy of the text data was printed and organized. Responses to the open-ended item were organized in a manner that permitted codifying and categorizing of the qualitative data. Descriptive coding, sometimes called topic coding, was the method used “in the transitional process between data collection and more extensive data analysis” (Saldaña, 2009, p. 4). Descriptive coding is defined by Tesch (1990) as “identification of the topic, not abbreviations of the content. The topic is what is talked or written about. The content is the substance of the message” (p. 70). In the current study, descriptive coding was used to analyze the basic topics within the narratives.

The qualitative data were further examined for recurrent themes. Validity and trustworthiness were ensured through the use of the mixed-methods framework by Creswell and Plano Clark (2011), as well as the use of evaluative criteria from Lincoln and Guba (1985). Within the convergent parallel design, quantitative and qualitative data were analyzed separately, and then quantitative findings and qualitative themes were examined for areas of convergence. Convergence involved reaching a common conclusion from the quantitative and qualitative results and was the culmination of the mixed method design (Creswell & Plano Clark, 2011).

A power analysis conducted prior to commencing the study indicated that 122 participants were required to have a power of 0.80 to detect a relationship between the independent and dependent variables using two-sided significance tests, with an alpha of $p < 0.05$. The final analytic sample of 139 participants provided sufficient statistical power for the study.

RESULTS

Faculty Characteristics
Table 1 summarizes the demographic characteristics of the study sample. The mean age of the study participants was 50.1 years ($SD = 8.8$ years), and they were predominantly White, non-Hispanic, and married females. The majority of the participants held a Master of Science in Nursing degree and were employed full time in baccalaureate programs. Most participants reported their clinical specialty to be medical–surgical nursing. Zip code data were collected from participants indicating the location of their schools of nursing. Faculty from 35 of the 50 states were represented. Of these faculty, the greatest percentage of the sample were from Alabama, with 16%.

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
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<td>2.2</td>
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<tr>
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<td></td>
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<tr>
<td>African American</td>
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<td>2.2</td>
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<tr>
<td>White</td>
<td>133</td>
<td>95.7</td>
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<tr>
<td>Two or more races</td>
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<td>1.4</td>
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<tr>
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<td>Highest degree held</td>
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<td></td>
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<td>BSN</td>
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<td>2.9</td>
</tr>
<tr>
<td>MSN</td>
<td>97</td>
<td>69.8</td>
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<tr>
<td>DNP</td>
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<td>5</td>
</tr>
<tr>
<td>EdD</td>
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<td>0.7</td>
</tr>
<tr>
<td>PhD</td>
<td>29</td>
<td>20.9</td>
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<tr>
<td>Employment status</td>
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<tr>
<td>Full time</td>
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<td>94.2</td>
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<tr>
<td>Part time</td>
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<td>5.8</td>
</tr>
<tr>
<td>Type of undergraduate program</td>
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<td></td>
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<tr>
<td>ADN</td>
<td>38</td>
<td>27.3</td>
</tr>
<tr>
<td>BSN</td>
<td>98</td>
<td>70.5</td>
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<tr>
<td>Clinical specialty</td>
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<td>Nursing fundamentals</td>
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<tr>
<td>Pediatrics</td>
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</tr>
<tr>
<td>Obstetrics–gynecology</td>
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<td>7.9</td>
</tr>
<tr>
<td>Critical care</td>
<td>12</td>
<td>8.6</td>
</tr>
<tr>
<td>Psychiatric–mental health</td>
<td>3</td>
<td>2.2</td>
</tr>
<tr>
<td>Other</td>
<td>13</td>
<td>9.4</td>
</tr>
</tbody>
</table>

Note. BSN = Bachelor of Science in Nursing; MSN = Master of Science in Nursing; DNP = Doctor of Nursing Practice; EdD = Doctor of Education; PhD = Doctor of Philosophy; ADN = Associate in Nursing degree.

* Mean age ($SD$) of the study sample was 50.1 (8.8) years.

^ Percentages may not equal 100 due to rounding.

Sum does not equal 139 due to missing data.
Georgia represented 13%, 8% represented New York, and 4% represented Pennsylvania and California.

**Use of HFHPS**

Among the sample, 75.5% (n = 105) reported that there was a simulation laboratory coordinator in their school of nursing. The participants reported the number of faculty who supervised a typical simulation scenario, as well as the number of students who participated in simulation experiences. From these data, a student-to-faculty ratio was calculated. The majority of the sample (50.5%) reported student-to-faculty ratios of 3:1 or lower. However, there was wide inconsistency in this variable, with 40 participants reporting student-to-faculty ratios of 2:1 or lower and seven participants reporting student-to-faculty ratios of 10:1 or higher. One participant reported having 130 students with one faculty member present in a simulation.

One hundred twenty-six faculty (90.6%) reported that simulation was used as a teaching method within their course. Almost 68% (n = 94) reported that simulation was used to substitute for traditional clinical hours. A ratio of substituted hours with simulation to total clinical hours was calculated and multiplied by 100 to create a percentage of hours substituted for traditional clinical hours. Among faculty who substituted simulation hours for traditional clinical hours, the observed range for the percentage of traditional clinical hours substituted was 1.25% to 100% with a median of 8.3%. These data revealed that although a large percentage of faculty reported substituting simulation for traditional clinical hours within their target course, the actual mean percentage of HFHPS hours substituted for traditional clinical hours was low.

**Research Question 1**

To facilitate interpretation of the quantitative data, Table 2 summarizes the study variables, instruments, and descriptive statistics for the variables. It was anticipated that research question 1 would be addressed with multiple linear regression. However, the outcome variable of HFHPS use, as measured by the percentage of simulation hours substituted for traditional clinical hours, did not meet a major assumption of multiple linear regression, which is that the dependent variable must be normally distributed. Consequently, a univariate approach to address the research question was used. The sample was divided into three groups: faculty who reported they did not use simulation in the clinical course (n = 9), faculty who reported simulation was used...
TABLE 3
Comparison of Simulation Use Groups of Predictor Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>No Simulation (n = 9)</th>
<th>Simulation–Substitution Group (n = 32)</th>
<th>Simulation–Substitution Group (n = 94)</th>
<th>Test Statistic</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>71</td>
<td>76.5</td>
<td>64.8</td>
<td>2.2</td>
<td>0.33</td>
</tr>
<tr>
<td>Clinical Site Scale</td>
<td>49.2</td>
<td>66.6</td>
<td>71.5</td>
<td>2.50</td>
<td>0.29</td>
</tr>
<tr>
<td>Student Readiness for Simulation Learning Scale</td>
<td>54.7</td>
<td>57.5</td>
<td>73.1</td>
<td>4.83</td>
<td>0.09</td>
</tr>
<tr>
<td>Comfort Levels Scale</td>
<td>56.8</td>
<td>79.7</td>
<td>66.6</td>
<td>3.54</td>
<td>0.17</td>
</tr>
<tr>
<td>Modified Teacher’s Sense of Efficacy Scale</td>
<td>82.4</td>
<td>81.2</td>
<td>63.1</td>
<td>6.14</td>
<td>0.046</td>
</tr>
<tr>
<td>Modified Teacher Confidence Scale</td>
<td>65</td>
<td>82</td>
<td>65</td>
<td>4.5</td>
<td>0.11</td>
</tr>
</tbody>
</table>

in the course but not as a substitute for traditional clinical hours (n = 32), and faculty who reported using simulation to substitute for traditional clinical hours (n = 94). Because of the small sample size in the no–simulation group, Kruskal-Wallis, the nonparametric equivalent of the one-way analysis of variance, was used to compare groups on the continuous predictor variables. Table 3 reports the group comparisons on the different variables that were proposed as predictors in the research question. The analysis demonstrated that faculty in the simulation–substitution group reported significantly lower self-efficacy for achieving student outcomes with simulation than faculty in the no simulation and simulation–no substitution groups.

Chi-square analysis was used to compare the simulation group, which did not substitute simulation hours for traditional clinical hours, and the group that substituted simulation hours for traditional clinical hours on the nominal level predictor variables of type of program (ADN versus BSN). The simulation substitution group had a greater proportion of BSN faculty (77.1%) compared with the no substitution group, where (56.3%) taught in BSN programs (χ² = 5.2, p = 0.04).

Research Question 2

One hundred twenty-five respondents answered the open-ended survey item. Although multiple themes were noted in the data, for this study, data from the two most relevant themes are reported. The two themes that emerged from the descriptive coding and qualitative analysis were (a) providing a safe environment and (b) a mixed blessing.

Providing a Safe Environment. Faculty described their experiences with simulation through the use of the term safe in their narratives. One participant stated, “Simulation scenarios provide a safe environment for students to prioritize nursing care, combine learning, and even make mistakes while faculty can watch and provide feedback.” Other faculty members described the emphasis on a safe environment in terms such as “make it safe, make it honest” and “it is considered a safe environment for them and a place where it is ok to make errors.” Faculty believed they were “able to teach learning activities in a safe environment.”

Several faculty expressed their experiences with simulation as a safe environment because students were “not afraid to ‘hurt’ the patient” while participating in simulation scenarios. This belief of a safe learning environment was further validated as faculty expanded their narrative descriptions to include how they felt simulation allowed students to experience patients and perform procedures without the associated risks to patients in the traditional clinical setting. Other faculty members described the emphasis on a real environment without the associated risks, such as, “Students can make mistakes without hurting patients.” Several faculty described simulation as an environment where mistakes were welcomed and valued as a piece of the learning puzzle. One faculty shared the impact on student learning provided by the safety of simulation as “students finally come along when they see the ‘aha’ moment after they make a mistake.”

Faculty also emphasized that students could perform tasks that are not allowed in the clinical setting. These tasks may be forbidden for students because of clinical facility policy or because they cannot be planned for with clinical assignments. One faculty member stated, “I think it’s a great tool to teach students about working with interdisciplinary teams, be able to perform duties that are not allowed in the clinical setting (e.g., hang blood), and expose them to situations that not all of the students will be able to experience (codes, hypoglycemic shock, etc.).” Several faculty members shared their experiences regarding seldom-allowed tasks by recalling: “There are all kinds of other things, like teamwork and communication skills, interactions with family, etc. that can be taught using this” and “The day provides an opportunity to challenge students with crisis situations (baby with asthma, sickle cell crisis/pain and [a] post-op[erative] boy with an allergic reaction to the antibiotic med[ication] administration).”

Mixed Blessing. The theme of a mixed blessing also emerged from the narratives. Faculty provided favorable descriptions of simulation as a teaching methodology, but they were burdened with its use due to time constraints and feelings of uncertainty related to the technology aspect of simulation. Describing the fear of technology, one participant said “nervousness” was a result of being “worried that I would not know how to use the technology.” Reflecting on the experience of working with simulation, one faculty member vividly commented:
Simulation has been a mixed blessing. It has been a great opportunity to offer students another vehicle through which to critically reflect. However, there is a trend at the institution I work at to make it as complicated as possible and really wanting patients to deteriorate. We have also had challenges related to getting the faculty to come to a common understanding of a safe learning environment. That safe learning environment is about keeping the students safe—mentally, physically, spiritually; many of our faculty are oriented to the idea that students cannot make a mistake in simulation as they will make a mistake in clinical and therefore be unsafe.

This comment provided insight into why simulation had become a mixed blessing. Instead of regarding simulation as a learning environment where mistakes can be made, this faculty participant commented on simulation as an environment where some faculty believed students might learn how to make mistakes. The faculty was fearful that students were learning to make mistakes, which could be transferred to the traditional clinical setting where actual patient harm could occur.

Research Question 3

In examining for convergence of the quantitative and qualitative results, one key area emerged. This related to decreased self-efficacy for HFHPS teaching among faculty using HFHPS and faculty perceiving HFHPS as a mixed blessing. Validation of the quantitative data became evident as qualitative themes emerged that supported data from the quantitative findings. Through quantitative analysis, lower self-efficacy with simulation teaching was noted in the faculty group that substituted simulation for traditional clinical hours. Qualitative themes supported that, although simulation was viewed as a positive teaching approach, it was a mixed blessing. This mixed blessing consensus confirmed that faculty did indeed experience feelings of lower self-efficacy within the simulation substitution group. Although these faculty members were using simulation in place of traditional clinical hours, they were not fully convinced that simulation was the best instructional method for various reasons. Faculty reported that they perceived pressure from peers and students to use more complex simulation scenarios. This greater complexity of the simulation experience may cause faculty to be more reliant on the simulator being fully functioning and the laboratory fully staffed. Faculty may experience lower self-efficacy as they realize that a simulator is nonfunctioning or the laboratory staffing is inadequate, which may prevent them from implementing a simulation scenario that required many hours of preparation and was valued by the educator. Furthermore, lower self-efficacy reported by faculty who were using simulation as a substitute for traditional clinical hours may have been observed because they were deeply immersed in simulation. This immersion allowed faculty to truly understand the challenges in assuring that complex scenarios were completed and that student learning outcomes were achieved. Also, faculty self-efficacy may also be a reflection of the uncertainty faculty felt about students making mistakes in simulation and how this will apply in real-life patient situations. All of these factors lead to lower self-efficacy concerning the use of simulation, which was viewed as a mixed blessing validating quantitative and qualitative findings.

DISCUSSION

In this study, faculty use of HFHPS was quantified as the percentage of traditional clinical hours substituted with simulation. From a measurement perspective, this variable created methodological challenges, as survey data provided by a few participants were illogical. For example, the number of simulation hours reported was more than the total required clinical hours. This issue reflects a broader problem of vague and imprecise measurement of simulation use observed in the literature. For example, it is often not apparent whether simulation experiences are used as a substitute for clinical hours and as a supplement to didactic content. It is difficult to ascertain what proportion of instruction is completed with simulation of the total hours of instruction. Consequently, consistency of simulation use among courses within a specific nursing program and between different programs has not been described. For future studies, it is important to specifically ask about the use of simulation in clock hours, including how many are used to substitute for traditional clinical hours, the number used to supplement didactic content, and the total number of clock hours of clinical and classroom instruction present within the program. The wide variability of simulation use observed in this study was similar to the findings of studies conducted by Nehring et al. (2001) and Nehring and Lashley (2004). Therefore, clarity about the extent of use within nursing programs is critical to establish best practices for use as a supplement to didactic content and substitute for clinical hours.

In the current study, 79.1% of the faculty participants reported 10% or less of the simulation hours within their clinical course substituted for clinical hours. Few guidelines exist regarding the optimal mix of traditional clinical hours, simulation hours used to substitute for traditional clinical hours, and simulation hours to supplement didactic content. Because identifying and maintaining quality clinical sites continues to provide challenges to faculty and as simulation as a pedagogy advances, 10% may be determined to be too low a percentage for simulation substitution. Opponents of simulation argue that certain nursing skills can be gained only in real-life settings, where the complexities of patient care are present and students cannot anticipate how a patient care situation will end (Valler-Jones et al., 2011). Research is warranted to validate the optimal mix of simulation and real-life clinical experiences needed to ensure competent, safe, and professional graduate nurses.

Within the univariate analysis, those faculty who substituted simulation hours for traditional clinical hours reported lower self-efficacy in achieving student learning outcomes with simulation than those faculty who did not use simulation or used simulation but did not substitute. At first, this finding seemed counterintuitive. However, it may be that faculty who were using simulation to substitute for traditional clinical hours understood the reality of using simulation, including the technical component, with its associated problems, the additional time needed to implement simulation, and the challenges of conducting simulation with large class sizes. These faculty participants may have reported lower self-efficacy due to lower levels of technology self-efficacy, which has been directly linked to the acceptance and use of educational technologies (Holden
Although these faculty participants were using simulation, they had more realistic expectations about the strengths and weaknesses of this technology due to their thorough understanding of simulation and its associated challenges.

The univariate analysis of low- and high-use simulation groups further indicated a greater proportion of faculty who were in the high substitution of clinical hours for simulation group reported teaching in a baccalaureate program. Similarly, Nehring and Lashley (2004) found community college-based nursing programs (likely ADN programs) were devoting 56.3% of curricular time toward simulation, whereas universities were reporting a simulation usage rate in their curricula of 62.5%. Hanberg (2008) found that ADN faculty experienced greater perceived barriers to simulation use than did BSN faculty. More research is needed to further explore how barriers to simulation use may be manifested in different types of prelicensure programs.

LIMITATIONS

This research study had several limitations. The two instruments used were developed specifically for this research study. Moreover, instruments originally developed for student use were adapted for faculty use. Consequently, strong validity evidence for these instruments may be lower than the original versions. In addition, the convenience sample was obtained from nurse educator–focused electronic mailing lists, including one for faculty interested in simulation, so it is possible that faculty use of simulation was greater and perceptions of simulation were more positive than what would be observed in the general population of nurse educators.

CONCLUSION

Simulation has the potential to change the face of nursing education as it opens doors for students to experience today’s complex and challenging patients and it enhances their critical thinking skills. The future of nursing education should include simulation, and through this study and future studies, factors that have historically limited faculty use of this teaching tool will be understood so that faculty and students can be rewarded through their experiences with simulation.

REFERENCES


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