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Short Communication

Faculty's Perception on Student Performance using vSim for Nursing® as a Teaching Strategy

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Abstract During the COVID-19 pandemic, clinical nurse educators within pre-licensure baccalaureate educational programs had to quickly adapt to new ways of teaching. Hospital-based clinicals no longer permitted students to attend and some schools of nursing (SON) transitioned to virtual simulation learning environments. These alternative learning strategies were imperative for students continued progression. The first purpose of this pilot study explored nursing faculty's perceived effectiveness of using vSim for Nursing® to replace clinical practice. A second purpose examined the effectiveness of faculty preparation.

Effectiveness was evaluated using an adapted version of the Simulation Effectiveness Tool – Modified (SET-M). Mean scores indicated that faculty strongly agreed on its effectiveness for students' learning, with all items ranging 57.9%-97.4%. Majority of faculty strongly agreed that their preparation was highly effective, ranging 86.8%-97.4%. Faculty perceived vSim for Nursing® to be an effective tool for replacement of clinical practice and felt prepared to meet the students' learning outcomes. Evidence to support the effectiveness of vSim is needed so faculty can make data driven decisions to support student success in clinical practice. Debriefing continues to be a prominent component to any form of simulation. Supporting and preparing faculty to meet students' competencies further ensures successful transition as a professional.

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Virtual Simulation in Nursing Education

The purpose of this pilot study explored faculty perceptions of vSim for Nursing® effectiveness as a clinical replacement and their preparedness to meet the clinical objectives in a large diverse urban SON. vSim for Nursing® is a form of virtual reality, a computer-based simulation experience allowing participants to interact with virtual patients within an ostensibly real-world environment. vSim for Nursing® is a Web-based interactive learning platform with simulated nursing case scenarios allowing students the opportunity to interact with their patient and receive performance feedback (Foronda et al., 2016). This virtual simulation (vSim) learning format, which can also be referred to as screen-based simulation, promotes practice of nursing skills, knowledge, critical thinking, decision-

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making, and reasoning (Laerdal, 2020). Formatting of all preset vSim scenarios is uniform, beginning with suggested readings, quizzes and graded simulated experience and customized feedback corresponding to student-selected actions/interventions (Foronda et al., 2016; Laerdal, 2020).

An extensive literature search yielded a gap in faculty's objective assessment of virtual simulation as a practical learning format and their readiness to use it. Numerous studies on students' perspective demonstrated its ability to promote nursing concepts understanding and improving skills development while advancing clinical reasoning and judgement (Foronda et al., 2016; Padilha, Machado, Ribeiro, & Ramos, 2018). Virtual simulation provides opportunities to practice skills, with immediate feedback, encouraging achievement of required competencies. However, there are few studies on nurse educators' perspectives of virtual simulation effectiveness. Early studies evaluating faculty perceptions of virtual simulation have suggested its' capacity to improve learning outcomes (Jenson & Forsyth, 2012; Tiffany & Hoglund, 2016). One study explored faculty's readiness to integrate virtual simulation in teaching intravenous catheter insertion skills resulting in positive evaluation of its' benefits and value (Jenson & Forsyth, 2012). In a course using Second Live for graduate nurse educator students, findings revealed increased personal awareness of attitudes, biases and judgements with related appreciation and understanding of persons different from oneself (Tiffany & Hoglund, 2016). Virtual simulation can be perceived as a practical teaching pedagogy, especially when faculty are equipped to fully participate in the process. As the literature revealed, screen-based simulation can be an applicable educational format, improving foundational knowledge while enhancing higher levels of critical thinking, reasoning, and professional judgement.

Methodology

This pilot project explored faculty's perceived effectiveness of using vSim for Nursing® to replace clinical practice.

Virtual Simulation Clinical Day

Participants were assigned by clinical groups and consisted of: (a) generic sophomore nursing students enrolled in fundamental course/clinical, (b) generic junior nursing students enrolled in pediatric course/clinical, and (c) accelerated nursing students enrolled in maternity, and pediatric courses/clinicals. Each clinical group was assigned the same four virtual simulation case scenarios. As the Simulation Coordinator, the researcher chose these case scenarios as they best corresponded to the didactic content. Twenty-four hours prior to the assigned clinical day, each student independently completed the designated vSim scenario. Together with their clinical educator, debriefing occurred on their assigned clinical day.

Participants

Thirty-eight faculty participated (35 females/3 males) with majority having a Masters in Nursing (MSN) degree [n = 26]). Two faculty were assigned to two clinical groups.

Instruments

An adapted version of the 19-question open domain Simulation Effectiveness Tool – Modified (SET-M) (Leighton, Ravert, Mudra, & Macintosh, 2015) was used. The SET-M tool is aligned with the International Nursing Association for Clinical Simulation and Learning (INACSL) Standards of Best Practice, Quality and Safety Education for Nurses (QSEN) practices, and American Association of Colleges of Nursing (AACN) baccalaureate essentials (Leighton et al., 2015). Two additional questions explored faculty's perception of meeting clinical goals and outcomes.

To explore if faculty felt they were prepared to teach using vSim, the researcher developed two preparatory materials: *Virtual Simulation for Instructors Only* (VoiceThread and PowerPoint), and *Virtual Simulation Overview* (written instructions). Each preparatory material had a corresponding survey. Six survey questions explored the *Virtual Simulation for Instructors Only* material while four survey questions pertained to the *Virtual Simulation Overview* material. All items had a Licker Scale of 1=Strongly Agree; 2=Somewhat Agree; 3=Do Not Agree. Unfortunately, the researcher could not attest that the educator reviewed these materials in advance of their assigned vSim experience. To elicit faculty feedback, an open-ended space for feedback, "please share your thoughts on this experience," provided additional data. Six questions obtained demographic data. Data collection occurred through April - June, 2020. University Institutional Review Board approval was obtained prior to data collection.

Results

Adapted SET-M Findings

As shown in Table 1, frequencies for all items demonstrated majority strongly agreed with all twenty-two items, ranging from 57.9% (n = 22) to 97.4% (n = 37). Five items had over 89.5% (n = 34), three items had over 78.9% (n = 30), seven items had over 68.4% (n = 26), and seven items had over 57.9% (n = 22). All items had minimal somewhat agreed responses, ranging from 2.6% (n = 1) to 36.8% (n = 14) with ten items over 26.3% (n = 10).

Table 1 Adapted Simulation Effectiveness Tool Modified (SET-M) n = 38 (%).

Survey Items: I (nurse educator) perceived:	Strongly Agree	Somewhat Agree	Do Not Agree	Mean	SD
1. Students' confidence was increased	27 (71.1%)	8 (21.1%)	3 (7.9%)	1.37	0.63
2. Students' learning process was increased	26 (68.4%)	10 (26.3%)	2 (5.3%)	1.38	0.59
3. Students are better prepared to respond to changes in their patient's condition	24 (63.2%)	11 (28.9%)	3 (7.9%)	1.46	0.65
4. Students' ability of assessment skills were increased	24 (63.2%)	10 (26.3%)	4 (10.5%)	1.47	0.69
5. Students developed a better understanding of the pathophysiology	27 (71.1%)	9 (23.7%)	2 (5.3%)	1.34	0.58
6. Students' felt more confident of their nursing assessment skills	23 (60.5%)	13 (34.2%)	2 (5.3%)	1.45	0.60
7. Students' felt empowered to make clinical decisions	23 (60.5%)	12 (31.6%)	3 (7.9%)	1.47	0.65
8. Students developed a better understanding of medications	22 (57.9%)	13 (34.2%)	3 (7.9%)	1.5	0.65
9. Students had the opportunity to practice their clinical-decision making skills	27 (71.1%)	11 (28.9%)	0	1.29	0.46
10. Students were able to prioritize care and interventions	29 (76.3%)	7 (18.4%)	2 (5.3%)	1.29	0.57
11. Students were more confident in their communication skills	26 (68.4%)	8 (21.1%)	4 (10.5%)	1.42	0.68
12. Students were more confident in their ability to teach patients about their illness and interventions	24 (63.2%)	11 (28.9%)	3 (7.9%)	1.45	0.65
13. Students were more confident in their ability to report information to health care team	22 (57.9%)	14 (36.8%)	2 (5.3%)	1.47	0.6
14. Students were more confident in providing interventions that foster patient safety	30 (78.9%)	6 (15.8%)	2 (5.3%)	1.26	0.56
15. Students were more confident in using evidence-based practice to provide nursing care	27 (71.1%)	11 (28.9%)	0	1.29	0.46
16. The debriefing process contributed to the students' overall learning	36 (94.7%)	2 (5.3%)	0	1.05	0.23
17. The debriefing process allowed the student to verbalize their feelings before focusing on the scenario	34 (89.5%)	4 (10.5%)	0	1.11	0.31
18. The debriefing process was valuable in helping the student improve their clinical judgment	34 (89.5%)	4 (10.5%)	0	1.11	0.31
19. The debriefing process provided opportunities for the student to self-reflect on their performance during e-learning experience	35 (92.1%)	3 (7.9%)	0	1.08	0.27
20. The debriefing was a constructive evaluation of the e-learning experience	37 (97.4%)	1 (2.6%)	0	1.03	0.16
21. Overall, I felt this e-learning experience met the learning needs of the students	30 (78.9%)	7 (18.4%)	1 (2.6%)	1.24	0.49
22. Overall, I felt this e-learning experience met the learning objectives for the students	30 (78.9%)	8 (21.1%)	0	1.21	0.41

Table 2 Virtual Simulation for Instructors Only Material / Virtual Simulation Overview Material n = 38 (%).

Virtual Simulation for Instructors Only Material	Strongly Agree	Somewhat Agree	Do Not Agree	Mean	SD
1. I listened to the VoiceThread of the Virtual Simulation for Instructors Only and found it prepared me to facilitate the virtual experience	36 (94.7%)	2 (5.3%)	0	1.05	0.23
2. I listened to the VoiceThread of the Virtual Simulation for Instructors Only and found it to be helpful	37 (97.4%)	1 (2.6%)	0	1.03	0.16
3. The Virtual Simulation for Instructors Only for met all the objectives stated to successfully meet the clinical learning outcomes	36 (94.7%)	1 (2.6%)	1 (2.6%)	1.08	0.36
4. The Virtual Simulation for Instructors Only gave me the confidence to successfully meet the clinical learning objectives	37 (97.4%)	1 (2.6%)	0	1.03	0.16
5. The Virtual Simulation for Instructors Only prepared me to facilitate the experience	36 (94.7%)	2 (5.3%)	0	1.05	0.23
6. I found the Virtual Simulation for Instructors Only helpful	36 (94.7%)	2 (5.3%)	0	1.05	0.23
Virtual Simulation Overview Material	**Strongly Agree**	**Somewhat Agree**	**Do Not Agree**	**Mean**	**SD**
1. I felt the students were prepared to engage in the virtual simulation discussion	33 (86.8%)	5 (13.2%)	0	1.13	0.34
2. I reviewed the students vSim scores prior to the scheduled virtual simulation	34 (89.5%)	1 (2.6%)	3 (7.9%)	1.18	0.56
3. I found the pre-assignment contributed to the students' ability to engage during the virtual simulation	37 (97.4%)	1 (2.6%)	0	1.03	0.16
4. I found the pre-assignment contributed to my ability to engage the students during the virtual simulation	35 (92.1%)	3 (7.9%)	0	1.08	0.23

Eight items did not receive any do not agree responses with the remaining ranging from 2.6% (n = 1) to 10.5% (n = 4). The debriefing items had the dominant strongly agreed upon responses, ranging from 89.5% (n = 34) to 97.4% (n = 37).

Virtual Simulation for Instructors Only and Virtual Simulation Overview Findings

As shown in Table 2, the six *Virtual Simulation for Instructors Only* items received significant strongly agreed responses ranging from 94.7% (n = 36) to 97.4% (n = 37). All six items had minimal somewhat agree responses ranging from 2.6% (n = 1) to 5.3% (n = 2). Only one question had a do not agree response of 2.6% (n = 1). Also shown in Table 2, the four *Virtual Simulation Overview* items had strongly agreed responses ranging from 86.8% (n = 33) to 97.4% (n = 37) with only one question receiving 7.9% (n = 3) as do not agree responses. Somewhat agree responses ranged from 2.6% (n = 1) to 13.2% (n = 5).

"Please Share Your Thoughts on This Experience" Feedback

The open-ended space supports findings to the effectiveness of virtual simulation. The major student-related

themes that emerged was regarding the vSim debriefing process, as faculty felt students "exhibited a willingness to contribute more"; "were engaged and eager to share the experience"; "discussion flowed smoothly" and "students…used intelligent and relative questions." A "greater awareness of nursing priorities" was also noted with additional statements as "found the pretest helpful in focusing their thinking to the patient at hand" and "the postpartum hemorrhage scenario…they were truly stressed about saving the patient…focused."

Educators' preparedness was expressed with statements such as they "felt more confident," "the material gave me a lot of confidence"; "I love…vSim and they loved it," "was very productive" and "program was good and easy." As this experience was scheduled due to COVID-19, using vSim was seen as a positive experience: "this reinforced the cohesiveness of the clinical class in this unique circumstance"; "a good alternative to meet…missing clinical hours," and "students…asked to do the other…exercises for practice."

Discussion

vSim Effectiveness

Faculty perceived virtual simulation to be meaningful and an effective pedagogy ensuring students' clinical progression. Educators strongly agreed, with 71.1% (n = 27), that using vSim enhanced students' overall confidence. Development of students' knowledge of nursing care concepts (Foronda et al., 2016; Padilha et al., 2018) was supported by the data to foster nursing care concepts (Foronda et al., 2016; Padilha et al., 2018) was confirmed with 78.9% (n = 30) strongly agreed responses for providing interventions that foster patient safety and 76.3% (n = 29) for students' ability to prioritize care and interventions. Faculty's perception of student confidence in using evidence-based practice to provide nursing care and having opportunities to practice clinical-decision making skills both received 71.1% (n = 27). Promoting clinical learning skills, enhanced reasoning, and judgement are fostered with screen-based simulation (Foronda et al., 2016; Jenson & Forsyth, 2012; Padilha et al., 2018).

Debriefing

Debriefing is an essential element to all forms of clinical experience, be it hospital-based or virtual. It is a critical component enhancing the virtual learning experience, providing students with the opportunity to "reframe the context of a situation, facilitate students' reflection, assess critical thinking, evaluate learning, and improve future performance" (Gordon, 2017, p. 668). The debriefing process was viewed as a constructive evaluation of the experience with 97.4% (n = 37) strongly agreeing; debriefing process contributed to students' overall learning was 94.7% (n = 36) and debriefing process provided opportunities for the student to self-reflect on their performance during the virtual simulation had 92.1% (n = 35). The intentional post-simulation discussion and receiving personalized feedback can facilitate students' self-awareness and reflections on their performance, enhancing and promoting clinical reasoning on actions and interventions (Gordon, 2017).

The debriefing process can be valuable in helping the student to improve their clinical judgment had strongly agreed 89.5% (n = 34) responses while students' ability to prioritize their care and interventions had 76.3% (n = 29). Interestingly, the survey item that 'students were more confident in their ability to report information to the healthcare team' had the highest somewhat agreed responses (36.5%/n = 14) and the lowest strongly agreed upon responses (57.9%/n = 22). This is understandable given only preset dialogue and communicative options were available during the vSim experience.

Faculty Preparation

Preparing faculty is an essential element for any successful student learning experience. Pre-simulation preparation can influence educators' teaching approach, learnedness, self-confidence, self-efficacy, apprehension, and skill performance (Tyerman, Lucktkar-Flude, Graham, Coffey, & Olsen-Lynch, 2016). The *Virtual Simulation* for Instructors Only material was extremely well received. Providing both a VoiceThread and a corresponding PowerPoint proved to be an effective and beneficial preparatory process. Evaluation of faculty preparedness with content on the objectives to assist students to successfully meet the virtual simulation learning outcomes received 94.7% (n = 36) strongly agreed whereas only 2.6% (n = 1) as somewhat agreeing and do not agree responses. Confidence to successfully meet the virtual simulation learning objective received 94.5% (n = 37) strongly agreed responses with zero disagreeing. Educator confidence augments student learning.

The *Virtual Simulation* Overview material had impressive strongly agreed upon responses, with all four survey items with 86.6% (n = 33)-97.4% (n = 37). Only one item had three do not agree responses (7.9%), which was "I reviewed the vSim scores prior to the scheduled virtual simulation experience." It was not mandatory to review students' scores, though highly recommended. Furnishing faculty with the tools to utilize during the debriefing process, specific details about the simulated scenario and appropriate reflective questions encourages students' exploration of their participation and self-process (Gordon, 2017).

As this occurred during the COVID-19 pandemic, with majority of faculty being adjuncts with full-time jobs, it was understandable there may have been time constraints. The quick and unplanned pivot to online instruction due

to the pandemic demonstrated faculty's ability to quickly adapt and be flexible to a new teaching strategy. As a pedagogical tool, faculty perceptions of the virtual simulations provided a quality experience to achieve clinical learning outcomes.

Limitations

Because this was the first time this SON utilized vSim for Nursing®, a lack of experience and inconsistency of virtual teaching, confidence and comfort was expected hence the need to assess faculty knowledge, and comfort. Although nursing faculty received the *Virtual Simulation for Instructors Only* material though the researcher cannot attest that it was read. Generalization cannot be assumed as only those faculty assigned to a virtual simulation at this single-center facility were eligible.

Conclusion

Evidence to support the effectiveness of this pedagogical tool is needed so faculty can make data driven decisions to support student success. Educators' adeptness at dispensing knowledge via a virtual simulation lends legitimacy to its' application in curricula. Debriefing continues to be a prominent component to any form of simulation. Faculty positively viewed using vSim to meet clinical outcomes and continue students' educational progression. Supporting and preparing faculty to meet students' competencies further ensures successful transition as a professional. Recommendations for future research around faculty's perception and/or preparedness remains a necessity. Providing workshops to integrate screen-based simulation technology and best practices to utilize these learning pedagogies can provide faculty with the confidence needed to successfully implement into nursing curricula.

Declaration of Competing Interest

There are no conflicts of interest or financial bias, including financial, consultant, institutional, and other relationships, to disclose.

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