Innovations in Nursing Education:
Recommendations in Response to the COVID-19 Pandemic

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Supported by the Undersigned Faculty Experts, Academic Leaders,
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Impact of COVID-19 Pandemic on Nursing Education

The COVID-19 pandemic has created unprecedented challenges to nursing education in Washington and across the United States. Nursing students, restricted from participation in face-to-face learning opportunities and "hands on" clinical experiences, are in danger of not progressing in their academic studies and to degree completion. The timeline to resume traditional educational practices is unknown. Governor Inslee, in a letter to President Trump from March 18, 2020 stated:

> *"Our hospitals will be in crisis by the end of this month"* and *"as the number of available health care professionals decreases, we do not have the ability to handle the surge in new COVID-19 patients."*

To prevent the spread of the novel Corona virus and preserve rapidly decreasing Personal Protective Equipment (PPE) for essential clinical personnel, hospitals, ambulatory clinics, and community centers, the state of Washington has discontinued on-site clinical experiences for nursing students. Simulation labs and centers, where most of clinical nursing skills are taught, are also closed in compliance with COVID-19 required social distancing and Governor Inslee's March 23 proclamation to "Stay Home, Stay Healthy."

Considering the current public health crisis, nursing programs across the state of Washington wish to help mitigate impending workforce shortages by facilitating progression of nursing students and timely graduation of seniors. Last year approximately 3,800 new graduates took their RN license exam in Washington. During this crisis, we can ill afford to keep soon-to-be new RNs from joining the workforce. Enabling nursing students to progress in their education and facilitating on-time graduation of nursing students will require widespread and immediate adoption of distance education nursing education pedagogies. To support temporary flexibility for nursing programs during this time, we review current evidence regarding the efficacy of non-traditional teaching-learning approaches and re-visit the utility of mandated requirements (e.g. 600 hours for BSNs and 500 for ADNs) that are not empirically associated with learning or practice outcomes.

Clinical Simulation in Nursing Education

In nursing education, clinical simulation has emerged as a logical and standardized educational methodology for nursing students to learn both common and complex patient conditions in a controlled simulated environment. Simulation-based learning experiences (SBE) is categorized relative to its degree of clinical fidelity as high, intermediate, or low (Laure et al., 2015). There is compelling evidence that simulated practice experiences at any level are an effective way to assist students with learning new concepts to develop clinical skills, and enhance critical reasoning capacity (Davis, et al, 2014; Hayden, et al., 2014; Weller et al., 2012, D'Zousa et al, 2017; Park et al, 2016; Aebersold, 2018; Zarifsanajey et al, 2016). Some authors assert that using simulated clinical environments to teach difficult clinical concepts and skills is a current gold standard in nursing education (Monaghan, 2015; Sawyer et al., 2015). SBE creates a safe learning environment for students to use deliberate practice for skill acquisition and mastery of clinical reasoning.

In addition to hands on simulated clinical experiences, computer-based simulation experiences have materialized in recent years as a replacement for face-to-face clinical learning (Donovan et al., 2018). Virtual simulation is an emerging technology facilitating effective teaching of various skills in nursing education (Foronda, et al, 2016). Growing evidence suggests that online clinical instruction via Virtual Reality Simulations (V-SIM), with interactive SBE can meet requirements for clinical replacement credits and allow for acquisition of clinical psychomotor skills at the novice nurse level (Benner, 2020). V-SIMS offer clinical learning experiences to students in a virtual reality (Johnson-Glenberg, 2018) where the student performance evaluation, and even debriefing, can occur asynchronously (Foronta & Bauman, 2014). Despite the asynchronous approach to virtual simulation, students report high satisfaction with the

opportunity to learn and practice communication and problem-solving skills (Gu, Zou, & Chen, 2017). Virtual patient care simulations are considered high-fidelity because they are extremely realistic and offer a high level of learner engagement (Gu, Zou, & Chen, 2017; Meakim et al., 2013; Rouke, 2020). Aligned closely with experiential learning theory, simulation-based education allows the student to participate in a standardized, concrete experience, then navigate their way through reflective practice to discern what went well and what could be done differently (Kolb, 2000; Rouke, 2020).

Duff, Miller, and Bruce (2016) published an integrative review of research conducted between 2008 and 2015 regarding the efficacy of V-SIMs. They found that learning through the use of virtual patients in simulated online clinical scenarios was comparable to traditional in-person simulations in terms of learning diagnostic reasoning, critical thinking, and assessment skills. Students participating in V-SIMs reported increased satisfaction and engagement in learning activities when compared to traditional ways of honing clinical patient care skills (Duff et al. (2016). The authors concluded that the realism of patient care scenarios and the need for students to constantly "think on their feet" was more challenging, thus potentially more rewarding, for students than working with standardized patients (trained actors) or manikins in traditional lab settings. Others (De Gagne, Oh, Kang, Vorderstrasse, & Johnson, 2013; Lin et al., 2012) reported students were more engaged in virtual patient scenarios than traditional clinical learning opportunities because of the safety offered by virtual environments for practicing new skills. Moreover, V-SIMS provided the opportunity for students to receive immediate feedback regarding skills performed and also challenged student assumptions and interpersonal communication skills without learners feeling shamed (Duff et al, 2016; Kleinheksel & Ritzhaupt, 2017).

Several research teams investigated whether virtual simulations are as effective in teaching clinical competencies as the traditional clinical experiences or in-person simulations. For example, Cobbett and Snelgrove-Clarke (2016) compared the effectiveness of a V-SIM with a face-to-face high-fidelity simulation for two different maternal-newborn clinical situations. Third-year undergraduate nursing students participated in the study. Results showed no significant differences in student learning outcomes between the two teaching modalities. Researchers concluded V-SIMS may therefore be used in place of traditional clinical learning opportunities.

In another study, Cummings and Connelly (2015) compared outcomes of eight hours of clinical observation with eight hours of virtual simulation for junior and senior undergraduate nursing students. The V-SIM scenarios involved pre- and post-simulation debriefing and quizzes, detailed patient information, and a documentation system. The scenarios were delivered in groups of three to four students at a time. After one year, students in V-SIM group reported higher levels of self-confidence and engagement in active learning. Both groups demonstrated equal mastery of clinical skills and improvement in their understanding of content. Likewise, Verkuyl et al. (2017) compared differences in knowledge, self-efficacy, and satisfaction between a pediatric nursing virtual simulation and face-to-face simulation among second-year pre-licensure and RN to BSN students. Investigators compared results for both groups and demonstrated comparable improvement in pediatric knowledge and self-efficacy as well as high satisfaction with learning modality across both groups, suggesting that similar outcomes may be achieved with virtual simulations in comparison to traditional simulation settings.

Other research teams investigated the effectiveness of various ratios of simulations to clinical learning on student outcomes. For example, Breymier, Rutherford-Hemming, Horsley, Smith, and Connor (2015) examined the ratios of simulation to supervised clinical hours per nursing course, as well as the rationale for substituting clinical learning with simulations in over 400 pre-licensure nursing programs in the United States. Over 77% of programs participating in the study indicated using simulation in place of supervised clinical instruction. The most common simulation to clinical replacement ratios among nursing programs was 1:1 (one hour of traditional hands-on clinical is equivalent to one hour of sim) or 2:1 (two hours of traditional clinical equals one hour of sim). Forty-five percent of nursing programs indicated they used the conservative 1:1 ratio; while 55% indicated that their program used a ratio of at least 2:1.

Emerging evidence regarding simulation to clinical ratios are in support of two hours of clinical time as equivalent to one hour of simulated learning experiences. This is substantiated by a recent study by Sullivan, et al., (2019) that simulation was more efficient and afforded more opportunity for physical assessment, skills practice, teaching, and clinical reasoning than traditional clinical. According to Breymier et al., (2015) numerous programs across the country have adopted a 2:1 ratio due to the immersive, intensive, repetitive nature of simulated learning. The Colorado State Board of Nursing has integrated current evidence on nursing student outcomes, and approved the replacement of traditional clinical time with time spent in simulation into its state policies and now allows for a 1:1 or 2:1 (i.e., 2 hours of clinical is equivalent to1 hour of simulation), (Colorado Department of Regulatory Agencies – Division of Professions and Occupations – Board of Nursing, 2018).

Curl, Smith, Chisholm, McGee, and Das (2016) also examined the effectiveness of using high-fidelity simulations in place of 50% of clinical experiences in four clinical specialty areas: maternity nursing, pediatrics, critical care, and mental health nursing. Students were assigned to either an experimental intervention group combining simulation and clinical experiences or a control group using only traditional clinical learning experiences. Student learning in four hours of high-fidelity simulations included pre-lab and post-lab debriefings and was equivalent to eight hours of traditional clinical. In other words, a 2:1 clinical to simulation ratio. At the end of the research study, students in the high-fidelity simulation group performed as well as students who participated in the traditional group. Both groups had similar outcomes on NCLEX pass rates. Over 95% of the students in the high-fidelity simulation reported that the simulations improved their critical thinking and confidence in performing clinical skills.

Clinical Hours Mandates

Many state boards of nursing do not require a prescribed number of clinical hours for prelicensure programs. We found no evidence demonstrating existence of a ‘right’ number of clinical hours to ascertain attaining prelicensure nursing program competencies or to assure passing the NCLEX on first try. An unpublished MSN thesis exploring differences in NCLEX pass rates amongst nursing programs in Kansas and Missouri based on number of clinical hours (range approximately 210 to 952) found no significant differences in first time pass rates based on number of required clinical hours (Longabach, 2012). Therefore, we propose that any mandates on minimum number of clinical hours required of all pre-RN licensure nursing programs in Washington temporarily be waived.

Proposal to Meet Urgent Needs Amid the COVID-19 Pandemic

Research studies investigating the learning outcomes of prelicensure students who used in-person simulation, V-SIMS, and traditional clinical experiences strongly suggest virtual learning experiences are as effective replacements for traditional clinical learning experiences. If nursing students in Washington State are to progress in their nursing education and senior nursing students are to graduate on time during this crisis, it is essential they receive distance clinical instruction (V-SIMS) that enables students to meet clinical objectives and ensures they are prepared for clinical practice and passing the NCLEX (Benner 2020; Benner, Tanner & Chesla, 2009; Benner, Hooper-Kyriakidis, Stannard, 2010). We believe there is sufficient evidence, as discussed previously, to replace traditional clinical experiences and in-person simulations with virtual clinical learning. We believe emerging evidence suggesting a 2:1 clinical to simulation ratio clearly demonstrates efficient and meaningful learning can take place in a simulated environment. Furthermore, virtual simulation has also been shown to be a logical and respected teaching modularity for nursing students to learn and refine skills while enhancing clinical reasoning capacity in a safe and effective manner. Both constructs of using virtual simulation, in combination with emerging evidence of a 2:1 ratio, and elimination of required minimal hours for all prelicensure programs is presented for your consideration in these unprecedented times.

Therefore, in the interest of enabling nursing education to support progression of nursing students through to their graduation, we propose the following temporary actions during this crisis:

- Transition to 100% virtual clinical simulation during the COVID 19 crisis and until opportunities to return to clinical settings are readily available and considered safe for students.
- Consider all virtual simulation hours as sufficient to meet program outcomes, clinical course outcomes, and objectives as defined and evaluated by the nursing programs.
- Recognize simulation hours as intensive, interactive learning worthy of a 2:1 ratio (two hours of clinical equals one hour of simulation). All simulations will be conducted in accordance to INACSL (International Nursing Association for Clinical Learning and Simulation) Standards of Best Practice.
- Eliminate requirements for minimum number of clinical hours for prelicensure programs leaving evaluation of student capacity to meet required end of program outcomes up to the nursing program.

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