# Virtual Simulation in Nursing Education Survey Report

CASN ACESI


Canadian Association
of Schools of Nursing

Association canadienne des
écoles de sciences infirmières



ISBN e-book: 978-1-989648-17-9

## Acknowledgements

The Canadian Association of Schools of Nursing (CASN) gratefully acknowledges the expertise, time, and contributions of all those who engaged in the development of the *Virtual Simulation in Nursing Education Survey Report*. We would especially like to thank the National Task Force on Virtual Simulation, a group of dedicated simulation in nursing education experts who assisted in the development of the survey questionnaire and this report. We extend special thanks to the nurse educators across the country that participated in the survey.

### National Virtual Simulation Task Force

| | |
|---|---|
| Sandra Goldsworthy (Co-Chair) | University of Calgary |
| Barbara Wilson-Keates (Co-Chair) | Nipissing University |
| Kymberley Bontinen | Douglas College |
| Judy Boychuk-Duchscher | Thomson Rivers University / CASN Board of Directors |
| Andrea Chircop | Dalhousie University |
| Leslie Graham | Ontario Tech University |
| Nicole Harder | University of Manitoba |
| Marian Luctkar-Flude | Queen's University |
| Hugo Marchand | McGill University |
| Tammy O'Rourke | Athabasca University |
| Karin Page-Cutrara | York University |
| Susan Prendergast | Dalhousie University |
| Michael Scarcello | Confederation College |
| Ruth Schofield | McMaster University |
| Kimberly Shapkin | University of Calgary |
| Lee-Anne Stephen | University of the Fraser Valley |
| Jane Tyerman | University of Ottawa |
| Margaret Verkuyl | Centennial College |
| Cynthia Baker | Canadian Association of Schools of Nursing (ex-officio) |

# Virtual Simulation in Nursing Education Survey Report

The impact of the COVID-19 pandemic on clinical placements and face-to-face simulation labs accelerated interest in virtual simulation in nursing education. At a series of national forums in the spring and summer of 2020, Canadian nursing faculty identified an urgent need for more information on the integration of virtual simulation in undergraduate and nurse practitioner programs. As a first step in response to this, the Canadian Association of Schools of Nursing (CASN) created a national task force of faculty with expertise on virtual simulation who guided the development, implementation, and analysis of a national faculty survey. The purpose of the survey was to provide the nursing education community and the task force with a national snapshot on virtual simulation use in schools of nursing across the country.

## Objectives

The specific objectives guiding the survey development were the following:

1. Identify the types of virtual simulations being used in nursing education in Canada;
2. Describe how virtual simulation is being used in schools of nursing;
3. Determine whether virtual simulation use is changing because of the pandemic; and
4. Identify benefits and challenges experienced by educators in using virtual simulation.

## Survey Development and Methodology

The National Task Force on Virtual Simulation guided CASN in developing a 26-question, online survey to assess the current state of virtual simulation in Canadian schools of nursing (*see Appendix A*). The questions addressed the following topics: sample characteristics; types of virtual simulation; use of virtual simulation; impact of COVID-19 on use; and benefits and challenges of virtual simulation.

The survey was translated and posted on CASN's survey platform (Qualtrics.com). It was then disseminated directly to the heads of CASN's 91 member schools, and to individuals who subscribe to CASN news updates. It was also posted on CASN's website as well as disseminated via social media and through members of the task force. The survey was open from September 3 – 28, 2020.

There were 186 responses and a survey completion rate of 71% (n=133). In total, 167 individuals accessed the survey in English and 19 in French.

## Results

Characteristics of the sample of respondents will be described first to provide a context for the survey results. This will be followed by a description of the types of virtual simulation being used at the time of the survey, how faculty were using virtual simulation, and the impact of the pandemic on virtual simulation use. In addition, data will be presented on the benefits and challenges being experienced, including faculty support needs.

### Sample Characteristics

The largest number of responses came from individuals located in Ontario (35%), followed by Alberta and British Columbia (16% each) and Quebec (9%). No responses were received from Prince Edward Island and the Yukon.

***Table 1***

*Respondents by Region*

| Province/Territory | Percentage of Respondents |
|---|---|
| Alberta | 16.1 |
| British Columbia | 16.1 |
| Manitoba | 5.6 |
| New Brunswick | 3.1 |
| Newfoundland & Labrador | 2.5 |
| Northwest Territories | 2.5 |
| Nova Scotia | 1.9 |
| Nunavut | 1.2 |
| Ontario | 35.4 |
| Prince Edward Island | 0 |
| Quebec | 9.3 |
| Saskatchewan | 6.2 |
| Yukon | 0 |

The majority of respondents identified themselves as a faculty member in an undergraduate program (55%). As for other respondents, 12% identified themselves as faculty in a graduate level program, 10% as clinical instructors in an undergraduate nursing program, 5% as faculty in a Nurse Practitioner program, and 17% who selected "Other," identifying their roles as administrative (program chair or director), simulation coordinator, and clinical placement coordinator. Respondents were employed by a university (59%), a college (35%), or a polytechnic (6%). Two-thirds had more than 10 years of experience as an educator, 21% had between 5-10 years, and 16% had less than 5 years.

***Table 2***

*Respondents by Professional Role*

| Professional Role | Percentage of Respondents |
|---|---|
| Graduate faculty | 12.4 |
| Nurse practitioner faculty | 5.3 |
| Undergraduate faculty | 54.7 |
| Clinical instructor | 10.2 |
| Other | 17.3 |

## Types of Virtual Simulation

Respondents were asked to identify the types of virtual simulation they had used, or were using at the time of the survey, from a list of options. A definition from the *Health Simulation Dictionary* (Lopreiato & Society of Simulation in Healthcare, 2016) was provided for each option to ensure a common understanding of the terminology.

Screen-based simulations were defined as simulations presented on a computer screen, which allows the learner to interact with the simulation using a keyboard, mouse, or other input device. This was the most common type of virtual simulation being used, selected by 63% of respondents. Screen-based simulations were closely followed by virtual patients, defined as interactive patient scenarios used for educational purposes. They were selected by 52% of respondents. Serious games (also called virtual simulation games), a game designed with an educational purpose and a competitive or testing element that provide simulations of real-world events and stimulate problem-solving, were selected by 37% of respondents. Virtual environments, applications that allow the learner to look about and navigate within a digitally simulated environment, were used by 24% of respondents. There were 11% of respondents who reported using virtual reality simulations, defined as immersive, 3D simulations that can "replicate real-life situations and health care procedures" (Chen et al., 2020, p. 2). Despite the increased use of virtual simulation, 17% of respondents indicated they had not used any type to date.

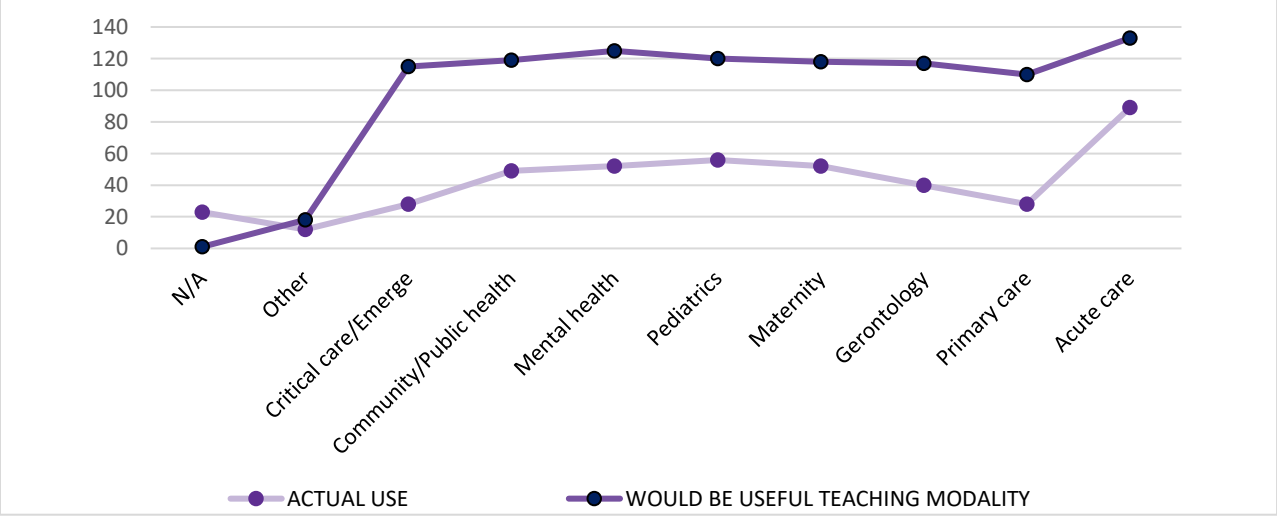
## Use of Simulation

When asked about the types of courses in which they were integrating virtual simulations, 51% identified clinical courses and 34% selected theory courses. Acute care virtual simulations were the most commonly used, selected by 59%. This is 20% higher than any other practice area. Pediatrics was selected by 37% of respondents, maternity by 35%, mental health by 35%, community/public health by 33%, gerontology by 27%, critical care by 19%, and primary care by 9%. "Other" was selected by 8% who reported using virtual simulations in the areas of leadership, Indigenous health, and palliative care.

There were respondents who indicated that virtual simulations would be a useful teaching modality in each clinical area. Acute care, however, was the option selected by the largest number of respondents (90%). The other clinical areas were selected by 74% to 84% of respondents, as shown in Table 3.

***Table 3***

*Clinical Areas Targeted by Virtual Simulation*



Faculty were using virtual simulations to develop clinical decision making (73%), critical thinking (64%), and clinical prioritization skills (63%). Health assessment and problem-solving skills, however, were selected by over half of respondents. Fewer reported using virtual simulations to develop skills in therapeutic communication (48%); medication administration (29%); relational practice (29%); interprofessional communication (27%); leadership (22%); cultural competence (21%); technical and procedural skills (20%); and dealing with chaos and conflict (14%).

Virtual simulations were primarily being used either as a stand-alone learning activity (61%) or as preparation for clinical practice (57%). Less than a quarter of respondents reported using virtual simulations to prepare learners for an in-person simulation (22%) or for remediation (17%).

Respondents were asked how they prepare students for a virtual simulation experience. The most common preparation was to provide students with resources to review prior to the simulation (74%), explaining the learning outcomes to be achieved (68%), orienting students to the virtual simulation (62%), and conducting a pre-brief (59%).

The most common methods for assessing student learning and experience following the virtual simulation included debriefs (64%), reflections (60%), and group discussions (50%). Methods reported by less than 40% of respondents included obtaining proof of completion of the simulation (36%) and testing students on the learning outcomes (23%). Nine percent (9%) selected "other" and reported using a post-simulation quiz, discussion forum posts, and surveys to assess the students and their experience.

As cost is a factor in the use of a teaching modality, respondents were asked how the virtual simulations they were using or were planning to use were being paid for. Multiple payment methods were selected by 39% of respondents, but 46% reported using free simulations. A combined 59% reported that the institution pays for simulations using tuition fees (38%) or grants (21%). For 39% of respondents, students pay for the virtual simulations used.

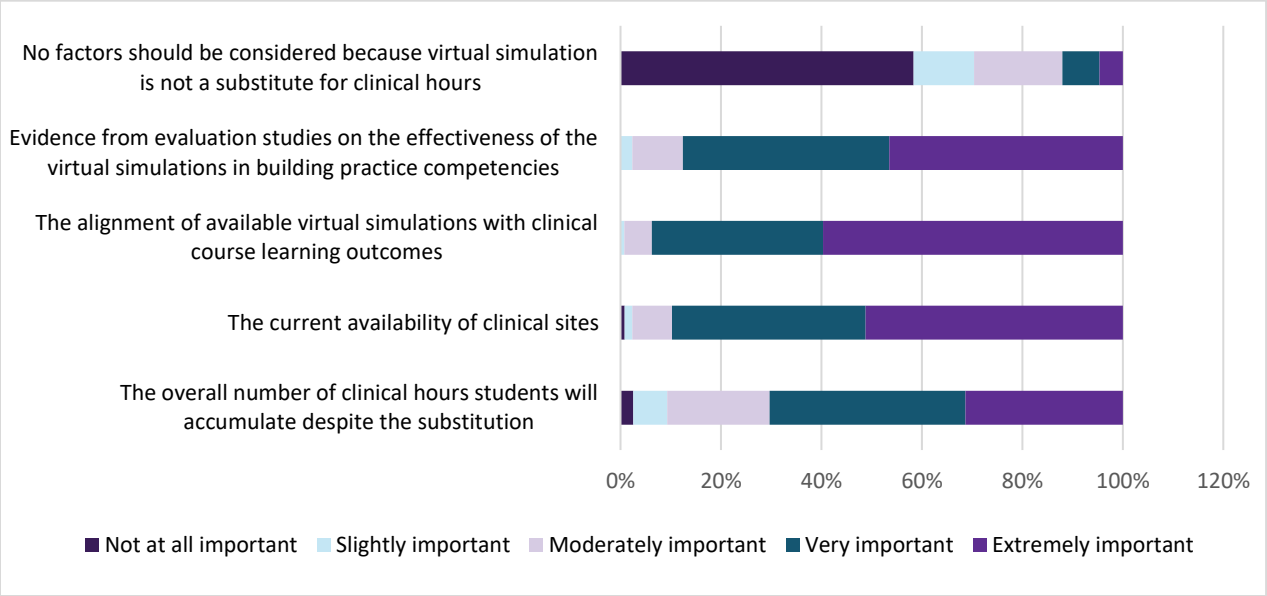
### Impact of COVID-19

The pandemic appears to have had a significant impact on the use of virtual simulation in nursing education. When asked whether COVID-19 had resulted in any changes in the use of virtual simulation, nearly three-quarters of respondents reported that they had been introduced into areas where they had not previously been used (74%). They also reported that the number of virtual simulations in the program were increasing (73%). Almost one third (31%) were using virtual simulations for the first time, while 11% of respondents reported that COVID-19 had not changed their use of virtual simulation and had no plans to do so. Respondents also reported that virtual simulations were replacing in-person learning activities during the pandemic for clinical practice (49%), simulations (49%), laboratory (41%), and classroom learning (23%).

With regards to substituting clinical time, 70% of respondents reported that their school was replacing clinical hours with virtual simulations in its baccalaureate level programs. In contrast, only 24% of nurse practitioner programs reported on in the survey had replaced clinical time with virtual simulation. In determining whether to replace clinical hours with a virtual simulation, the most important factors respondents identified were the alignment of available virtual simulations with the learning outcomes of the clinical course, the current availability of clinical sites, and the evidence of effectiveness of the virtual simulation, as seen in Figure 4.

***Table 4***

*Factors to Consider when Replacing Clinical with Virtual Simulation*




The additional factors to be taken into account that were most commonly identified included:

- Ability to assess whether the simulation objectives are met
- Funding
- Quality of the virtual simulation
- Level of the learner.

## Benefits and Challenges

Respondents were asked an open-ended question about the benefits, if any, of using virtual simulation in nursing education programs. The benefits presented below were the most commonly identified.

**Virtual simulations:**

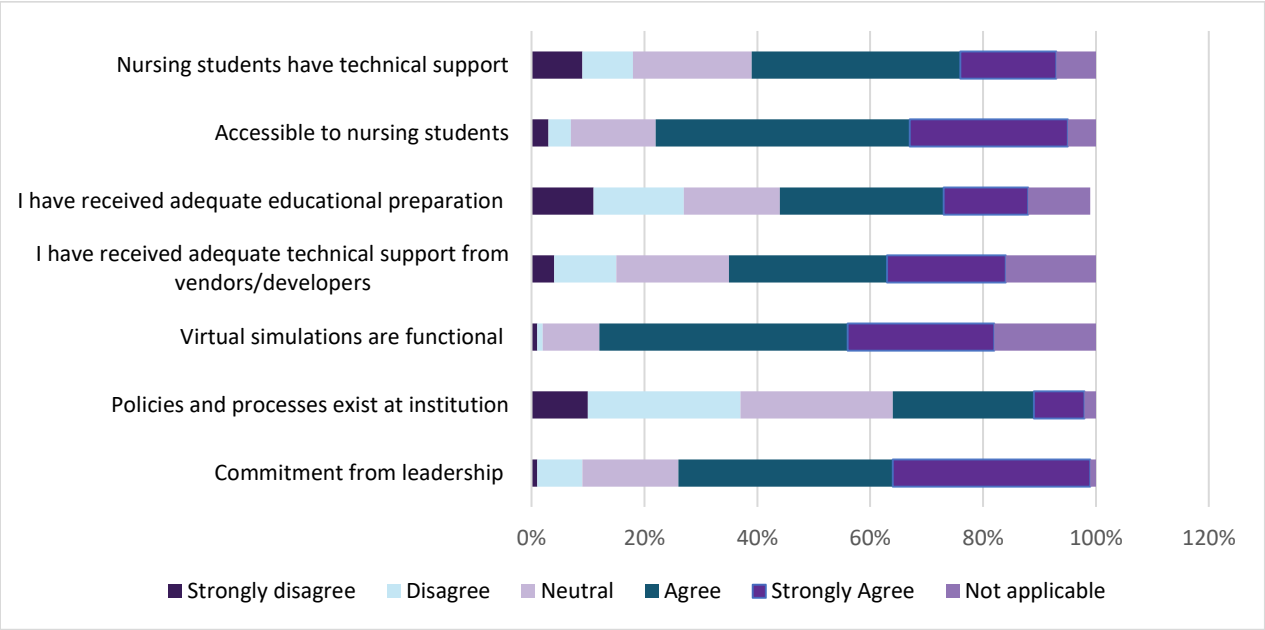
- Address a lack of or interruptions to clinical placements by allowing students to meet required competencies (28%)
- Provide an opportunity for students to learn in a safe environment (25%)
- Enhance or reinforce clinical experiences (23%)
- Promote and develops critical thinking, clinical decision-making, clinical reasoning, and clinical judgement skills (20%)
- Prepare students for a clinical practice experience (16%)
- Allow for repetition, mastery, and the ability to complete at one's own pace (14%)
- Are standardized learning tools (9%)

Respondents were presented with statements related to accessibility, functionality, and supports when using virtual simulation, and they rated their level of agreement using a 5-point Likert-scale from "Strongly Disagree" (1) to "Strongly Agree" (5). Table 5 shows the level of agreement or disagreement with each of the statements. An equal percentage (73%) of respondents strongly agreed or agreed with the two

following statements, “That the leadership of the institution is committed to the use of virtual simulation” and “Nursing students in my institution are able to access virtual simulations”. The statements with the highest percentage of disagreement, at 27%, were “Policies and processes exist at my institution to guide the use of virtual simulation” and “I have received adequate educational preparation in using virtual simulation”.

***Table 5***

*Supports Available for the Use of Virtual Simulation*




Respondents were asked to describe any other challenges they have encountered in using virtual simulation. The following challenges were most commonly identified:

- Cost (32%);
- Lack of adequate preparation/support/training on how to use virtual simulation appropriately (16%);
- Resistance or negative attitudes amongst faculty and/or students (13%);
- Challenging to select given the sheer volume, lack of expert reviews, and/or uncertain they will align with learning outcomes (10%);
- Technical issues and lack of technical support (9%);
- Limitations for student learning due to lack of ‘realness’, so students are focused on getting the correct response rather than deeper learning (9%); and
- Infrastructure – lack of access to technology and/or Internet connection (9%).

When asked about resources required to effectively implement virtual simulation, respondents indicated that educators need time to become knowledgeable (91%), funds to purchase simulations (80%), technical support from the institution (78%), and more information about different offerings (68%). Respondents were also asked what types of pedagogical supports should be in place, and 88% identified a need for information about best practices in virtual simulation. Over 70% of respondents indicated a need for information and guidance on how to use virtual simulation most effectively to build practice competence, conduct assessments, prepare students for a virtual simulation, use virtual simulation in different clinical

practice areas, replace clinical time with virtual simulation, and learn theories to guide the use of simulation.

The final question of the survey was open ended and asked respondents to comment on how CASN, the national organization representing nursing education in Canada, can support nurse educators in incorporating virtual simulation. The following were the most commonly identified:

- Develop evidence-based guidelines and other pedagogical supports;
- Develop free/low-cost simulations;
- Provide (free or low cost) educational sessions such as webinars or information sessions;
- Provide (free or low cost) course offerings or other professional development opportunities;
- Produce a statement on how virtual simulation should be used, including replacement of clinical hours; and
- Develop more virtual simulations in French.

## Discussion

While in-person high fidelity simulation has become an integral part of nursing education and is considered to offer high-quality educational learning experiences, virtual simulations are a more recent component of health professional education. Because of the restrictions of the COVID-19 pandemic, however, responses to the survey indicate that the integration of virtual simulation in Canadian nursing education has grown rapidly. Respondents reported that the use of virtual simulation in programs of nursing had increased substantially in order to continue educating students to meet entry-level competencies within program timelines. Nearly half of the survey respondents reported using virtual simulation to replace in-person clinical placements.

Discussions around the replacement of clinical placements with simulations are not new. For example, in 2014 the NCSBN released a report of their simulation study that indicated 50% of clinical placements could be replaced with high fidelity simulation (Alexander et al., 2015, p. 39). There were concerns, however, that the same results may not be achieved by faculty and schools without preparation and experience (Alexander et al., 2015). Canadian nurse educators in this survey appeared to be attuned to some of the complexities that have been identified in replacing virtual simulation to build practice competencies. Respondents emphasized, for example, the importance of aligning virtual simulations with learning outcomes and the need for evidence on the effectiveness of a given virtual simulation. Overall, survey findings indicate that nurse educators were carefully and judiciously selecting virtual simulations to replace clinical hours when required to by the circumstances of the pandemic.

Consistent with reports in the literature showing virtual simulation to be effective in developing the ability to apply knowledge in clinical situations (Chiniara et al., 2013; Kononowicz et al., 2019), respondents indicated they were using virtual simulation to build decision making, clinical reasoning, and critical thinking skills. They were less likely, however, to use virtual simulation to develop relational skills, although there is evidence that virtual simulation can be effective in developing communication and team-work skills (Foronda et al., 2013; Peddle et al., 2016).

Respondents identified a variety of methods they were using to prepare students for a virtual simulation experience and to assess students following the simulation. Debriefing was the most common post-simulation activity reported. This is well supported by evidence in health education literature (Levett-Jones & Lapkin, 2014; Sawyer et al., 2016) and a best practice standard articulated by the International Nursing Association for Clinical Simulation and Learning (INASCL) (2016). Although virtual simulations typically contain assessment and feedback elements, these do not have the same benefits as a debrief (Abulebda et al., 2020; Sawyer at al. 2016). In addition, a well executed debrief connects the experience

to the learning objectives of the simulation and provides learners with feedback that can improve future performances. Debriefing has been reported to shine a light on the learner's thought processes and decision-making, elements which are critical for educators to see in order to either reinforce the student's current frame of mind, or change the frame completely (Horsley, 2017). The self-reflection and emotional awareness developed through debriefing can help learners to think and act like a nurse (Lyles & Heid, 2019). With students learning from home, debriefing also provides an important opportunity for them to connect with their peers and teachers (Bradley et al., 2020). Although recognizing the value of existing debriefing modalities, Verkuyl et al. (2018) have recommended that "innovative debrief formats and designs" be developed for virtual simulation (p.13).

Respondents noted many of the benefits of using virtual simulation that have been described in the literature: virtual simulations develop knowledge and skills; can be used to enhance clinical experiences; provide a safe way to learn and practice skills; offer standardized learning experiences; and can fill gaps in clinical placements. In line with evidence in the literature, they also identified an urgent need for adequate resources and faculty preparation in order to deliver high-quality virtual simulation experiences effectively (Smiley, 2019; Thomas & Kellgren, 2017). It has been recommended that the pace of integrating virtual simulations in a program be aligned with the integration of the resources and support faculty require to gain the necessary expertise (Alexander et al., 2015).

Two consistent themes throughout the survey responses were the need for nurse educators to have the time and resources to develop the capacity to use this teaching modality effectively, and a recognition that there is a gap between current and optimal use of virtual simulations. These themes are summarized in the respondents' call to CASN to provide evidence-based pedagogical supports, professional development, and other learning opportunities.

## Limitations

This report describes the results of a survey conducted with a non-representative, convenience sample of nurse educators from across Canada. The invitation to participate was circulated to CASN's 91 member schools and no restrictions were placed on who could participate in the survey. Moreover, the questionnaire collected limited demographic information from respondents. Respondents were not required to provide their names or the name of their school. Further research is required to understand virtual simulation at the level of the school, provinces, and country wide. The results provide a snapshot in time, however, and were intended to stimulate further discussion and exploration of virtual simulation in Canadian nursing education.

## Conclusion

The use of virtual simulation in Canadian nursing education accelerated with the onset of the COVID-19 pandemic. Virtual simulation offers a learning tool that can build decision-making, clinical judgement, and many other skills critical to nursing competence, and has a place in nursing education alongside classroom, simulation, and clinical placements. Nurse educators are aware of many benefits offered by virtual simulations but are challenged by the cost and by their lack of experience in using virtual simulations. Resources and capacity-building are needed to ensure virtual simulations are effective and meaningful learning experiences for Canadian nursing students.

## References


Abulebda K., Auerbach M., & Limaiem F. (2020, November 21). *Debriefing techniques utilized in medical simulation.* StatPearls Publishing LLC. https://www.ncbi.nlm.nih.gov/books/NBK546660/

Alexander, M., Durham, C.F., Hooper, J. I., Jeffries, P. R., Goldman, N., Kardong-Edgren, S., Kesten, K. S., Spector, N., Tagliareni, E., Radtke, B., & Tillman, C. (2015). NCSBN simulation guidelines for prelicensure nursing programs. *Journal of Nursing Regulation, 6*(3), 39-42. https://www.ncsbn.org/simulationguidelines_alexander_2015.pdf

Bradley, C. S., Johnson, B. K., & Dreifuerst, K. T. (2020). Debriefing: A place for enthusiastic teaching and learning at a distance. *Clinical Simulation in Nursing*, *49*, 16-18. https://doi.org/10.1016/j.ecns.2020.04.001

Canadian Association of Schools of Nursing (2015). *Practice domain for baccalaureate nursing education: Guidelines for clinical placements and simulation.* https://www.casn.ca/wp-content/uploads/2018/07/FINAL-clinical-sim-2015-revised-nov-2016.pdf

Chen, F-Q., Leng, Y-F., Ge, J-F., Wang, D-W., Li, C., Chen, B. & Sun, Z-L. (2020). Effectiveness of virtual reality in nursing education: A meta-analysis. *Journal of Medical Internet Research, 22*(9). https://doi.org/10.2196/18290

Chiniara, G., Cole, G., Brisbin, K., Huffman, D., Cragg, B., Lamacchia, M. & Norman D., & Canadian Network for Simulation in Healthcare, Guidelines Working Group (2013). Simulation in healthcare: a taxonomy and a conceptual framework for instructional design and media selection. *Medical Teacher, 35*(8), 1380-95. https://doi.org/10.3109/0142159X.2012.733451

Foronda, C., Liu, S. & Bauman, E. B. (2013). Evaluation of simulation in undergraduate nursing education: An integrative review. *Clinical Simulation in Nursing, 9*(10), 409-416. https://doi.org/10.1016/j.ecns.2012.11.003

Horsley, E. [Canadian Association of Schools of Nursing]. (2017, January 26). *Stocking your debriefing toolbox: A guide for novice debriefers* [Webinar]. YouTube. https://www.youtube.com/watch?v=KYt23Z8MU4Q&list=PLbL0o2SLlgLFIYF15WVRv35mV8kM40-W1&index=4

INACSL Standards Committee (2016). INACSL Standards of Best Practice: Simulation debriefing. *Clinical Simulation in Nursing*, *12*(S), S21-S25. https://doi.org/10.1016/j.ecns.2016.09.008

Kononowicz, A., Woodham, L. A., Edelbring, S., Stathakarou, N., Davies, D., Saxena, N., Tudor Car, L., Carlstedt-Duke, J., Car, J., & Zary N. (2019). Virtual patient simulations in health professions education: Systematic review and meta-analysis by the digital health education collaboration. *Journal of Medical Internet Research,* 21(7). https://doi.org/10.2196/14676

Levett-Jones T. & Lapkin S. (2014). A systematic review of the effectiveness of simulation debriefing in health professional education. *Nurse Education Today*, *34*(6), 58-63. https://doi.org/10.1016/j.nedt.2013.09.020

Lopreiato, J. O. & Society of Simulation in Healthcare (Eds.) (2016). *Healthcare Simulation Dictionary*. Agency for Healthcare Research and Quality. https://www.ahrq.gov/sites/default/files/publications/files/sim-dictionary.pdf

Lyles, D. & Heid, C. (2019, January 9). *The power of a good debrief after a virtual simulation.* Assessment Technologies Institute. https://atitesting.com/educator/blog/knowledge/2019/01/09/the-power-of-a-good-debrief-after-use-of-virtual-simulations

Peddle, M., Bearman, M., & Nestel, D. (2016). Virtual patients and nontechnical skills in undergraduate health professional education: An integrative review. *Clinical Simulation in Nursing*, *12*(9), 400-410. https://doi.org/10.1016/j.ecns.2016.04.004

Sawyer T., Eppich W., Brett-Fleegler M., Grant V., Cheng A. (2016). More than one way to debrief: A critical review of healthcare simulation debriefing methods. *Simulation in Healthcare, 11*(3), 209-17. https://doi.org/10.1097/SIH.0000000000000148

Smiley, R. A. (2019). Survey of simulation use in prelicensure nursing programs: Changes and advancements, 2010-2017. *Journal of Nursing Regulation*, *9*(4), 48-61. https://doi.org/10.1016/S2155-8256(19)30016-X

Thomas, C. M., & Kellgren, M. (2017). Benner's novice to expert model: An application for simulation facilitators. *Nursing Science Quarterly, 30*(3), 227-234. http://doi.org/10.1177/0894318417708410

Verkuyl, M., Lapum, J., Hughes, M., McCulloch, T., Liu, L., Mastrilli, P., Romaniuk, D., & Betts, L. (2018). Virtual gaming simulation: Exploring self-debriefing, virtual debriefing, and in-person debriefing. *Clinical Simulation in Nursing*, *20*, 7-14. https://doi.org/10.1016/j.ecns.2018.04.006

## Appendix A

### Page 2: Demographic Questions

1. What is your professional role or position in nursing education? (*Check all that apply.*)
    - Faculty – Graduate nursing programs (master's, doctoral)
    - Faculty – Nurse practitioner program
    - Faculty – Undergraduate nursing program
    - Clinical Instructor – Undergraduate nursing program
    - Other, please describe:

2. In what province or territory are you located?
   *(Drop down list)*

3. In what type of institution are you currently employed?
    - University
    - College
    - Other, please describe:

4. How long have you been an educator?
    - Less than 2 years
    - 2-5 years
    - 5-10 years
    - 10+ years

### Page 3: Types of Simulation and Areas of Practice

5. What types of remotely delivered virtual simulation have you used, or do you currently use in your teaching? *(Check all that apply.)*
    - **Screen-based simulations:** Presented on a computer screen, these simulations allow the learner to interact with the interface using a keyboard, mouse, or other input device. Programs provide feedback and track the actions of the learner**.**
    - **Serious games**: A game designed with an educational purpose and a competitive or testing element; they provide simulations of real-world events and stimulate problem-solving. These are also called virtual simulation games.
    - **Virtual patients**: Screen-based simulations with interactive patient scenarios used for educational purposes.
    - **Virtual environments**: Applications that allow the participant to look about and navigate within a digitally simulated environment. Examples include virtual communities, towns, or cities.
    - **Virtual reality simulations:** These are immersive, 3D simulations that can replicate real life situations and health care procedures. Examples include virtual reality headsets, glasses, or goggles.
    - **Other**, please describe:
    - **No virtual simulation used to date.**

6. What clinical practice areas are targeted by the virtual simulations you use? *(Check all that apply.)*
    - Acute care

- Primary care
- Gerontology
- Maternity
- Pediatrics
- Mental Health
- Community/Public health
- Critical care/Emergency care
- Other, please describe:
- N/A

7. In which of the following practice areas do you believe virtual simulations are a useful teaching modality? *(Check all that apply.)*

    - Acute care
    - Primary care
    - Gerontology
    - Maternity
    - Pediatrics
    - Mental Health
    - Community/Public health
    - Critical care/Emergency care
    - None
    - Other, please describe:

8. How are the virtual simulations paid for? *(Check all that apply.)*

    - Institution pays for the programs using tuition fees
    - Institution pays for the programs using a grant
    - The students pay for the product
    - The products are free to use
    - Not applicable (have not used virtual simulation)
      Other, please describe:

**Page 4: Use, Benefits, and Challenges of Virtual Simulation**

9. I have used virtual simulations to foster the development of: *(Check all that apply.)*

    - Clinical decision-making
    - Clinical prioritization
    - Health assessment skills
    - Medication administration
    - Problem solving
    - Technical and procedural skill development
    - Critical thinking
    - Therapeutic communication skills
    - Leadership skills
    - Relational practice skills
    - Interprofessional communication
    - Cultural competence
    - Skills to deal with chaos and conflict

- Other, please describe:

10. I have used virtual simulation for: *(Check all that apply.)*

    - Preparation for an in-person simulation experience
    - Preparation for clinical practice
    - A stand-alone learning activity to meet specific outcomes
    - Remediation

11. I have used virtual simulation in the following types of course: *(Check all that apply.)*

    - Theory course
    - Clinical course
    - Laboratory course
    - Have not used virtual simulation in any course

12. How do you prepare students for a virtual simulation experience? (*Check all that apply*.)

    - Require resources (readings, video, other materials) that should be reviewed prior to completing the simulation
    - Conduct a pre-briefing
    - Orient students to the virtual environment
    - Explain the learning outcomes to be achieved prior to the virtual simulation
    - Not applicable
    - Other, please describe:

*13.* How have you assessed students and their experience following a virtual simulation? *(Check all that apply.)*

    - Conducting a debrief
    - Reviewing students' reflections on the experience
    - Conducting a group discussion
    - Testing students on the learning outcomes
    - Assessing whether the simulation was completed
    - No assessment carried out to date
    - Other, please describe:

14. If applicable, please indicate your level of agreement with each of the following statements:

    *Scale: Strongly disagree, Disagree, Neutral, Agree, Strongly Agree, N/A*

    - The leadership at my institution is committed to the use of virtual simulation.
    - Policies and processes exist at my institution to guide the use of virtual simulation.
    - The virtual simulation(s) I use are functional from a technical standpoint.
    - I have received adequate technical support from the vendors/developers of the virtual simulations used.
    - I have received adequate educational preparation in using virtual simulations in my courses.
    - The nursing students in my institution are able to access virtual simulations.
    - The nursing students in my institution have access to technical support when using virtual simulations.

15. In your opinion what are the benefits, if any, of using virtual simulations in nursing education?

16. To what extent do you believe that the following are **challenges** to the use of virtual simulation in nursing education:

    *Scale: Strongly disagree, Disagree, Neutral, Agree, Strongly Agree*

    - Virtual simulations do not always develop the intended knowledge and skills.
    - Virtual simulations do not always contain accurate information.
    - Functionality, from a technical standpoint, is an impediment to the use of virtual simulation.
    - Many available virtual simulations do not fit the Canadian context.
    - Virtual simulations are unavailable in French.
    - Faculty are resistant to using virtual simulation in their courses.
    - Clinical instructors are resistant to using virtual simulations.

17. Please identify any other challenges you may have experienced in using virtual simulations:

**Page 5: COVID-19 pandemic and the use of virtual simulation**

18. Please indicate any changes you program has implemented or is planning to implement, as a result of COVID-19, related to the use of virtual simulation. *(Check all that apply.)*

    - COVID-19 has not resulted in changes or planned changes in the use of virtual simulation.
    - Virtual simulations will be introduced for the first time.
    - The number of virtual simulations being used are increasing.
    - Virtual simulations are being introduced in areas where they were not previously used.
    - Virtual simulations are being used to replace in-person classroom learning.
    - Virtual simulations are being used to replace in-person simulations.
    - Virtual simulations are being used to replace in-person laboratory time.
    - Virtual simulations are being used to replace in-person clinical time.
    - Other, please describe:

19. Is your school using virtual simulation to replace **clinical hours** in its baccalaureate program(s) as a result of COVID-19?

    - Yes
    - No

20. Is your school using virtual simulation to replace **clinical hours** in its nurse practitioner program as a result of COVID-19?

    - Yes
    - No
    - Not applicable (school does not offer an NP program)

21. Has your provincial or territorial regulatory body indicated a number of clinical hours or percentage of clinical hours that can be replaced by simulation?

    - Yes (please identify the province/territory and describe the regulation):
    - No
    - Not sure

22. To what extent do you believe that each of the following are important to take into account in determining whether to replace clinical hours with virtual simulations?

    *Scale: Strongly disagree, Disagree, Neutral, Agree, Strongly Agree*

    - The overall number of clinical hours students will accumulate despite the substitution.
    - The current availability of clinical sites.
    - The alignment of available virtual simulations with clinical course learning outcomes.
    - Evidence from evaluation studies on the effectiveness of the virtual simulations in building practice competencies.
    - No factors should be considered because virtual simulation is not a substitute for clinical hours.
    - Other, please describe:

**Page 6: Implementing Virtual Simulation**

23. What resources do you or your program require to implement virtual simulations effectively? *(Check all that apply.)*

    - Funds to purchase simulation programs
    - Time for educators to become knowledgeable about virtual simulation
    - Information about different companies and their virtual simulation offerings
    - Technical support from the institution
    - Other, please describe:

24. What types of pedagogical support do you feel you need to implement virtual simulations in your teaching effectively? *(Check all that apply.)*

    - Information on learning theories to guide the use of virtual simulation
    - Information about best practices in virtual simulation
    - Evidence about the use of virtual simulation for various nursing practice areas
    - Guidance on the best ways to use virtual simulation to build practice competencies in nursing students
    - Guidance on using virtual simulation to replace clinical time
    - Information on appropriately preparing students for a virtual simulation session
    - Information on assessing students following the use of virtual simulation
    - Other, please describe:

25. As the national organization representing nursing education in Canada, how can CASN support nursing educators incorporate virtual simulation in their teaching?

26. Have you developed any virtual simulations? If you are willing to share this simulation with other educators, please include your email in the comment box below. You will be contact by a CASN staff member.

**General comments:**


ISBN e-book: 978-1-989648-17-9