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# School-based research agenda on healthcare simulation for nursing education in Hong Kong

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## ABSTRACT

**Background** Healthcare simulation has been used as a pedagogical strategy in nursing education. Evidence has shown one of the positive impacts that simulations replace clinical placement. These wide-ranging initiatives are essential, and they can guide a nursing school's simulation training. However, researching each innovation in the nursing field is beyond the scope.

**Methods** To focus our research and develop the capacity and capability to incorporate healthcare simulation in nursing education, we used a consensus building process to establish a school's research agenda. A modified Delphi process was adopted to reach a consensus among 10 nursing faculty members in one university with a visiting professor's support.

**Results** The three themes were identified as (1) embedding simulation into the baccalaureate in nursing curriculum, (2) designing effective simulation-based education and (3) simulating education in the broader world (adolescents). These themes were further categorised into two areas that used simulation in the educational and community settings. Sixty per cent of the faculty members agreed that the question, 'How can simulation be incorporated into clinical placements to enhance students' learning?' should be the highest research priority.

**Conclusion** This study adds understanding to incorporate simulation-based education in the nursing curriculum and community provides insights into future research.

## INTRODUCTION

For over three decades, healthcare simulation has been used widely as a teaching and learning strategy in nursing education programmes. Simulation can provide learners with a realistic clinical environment and enable them to learn and practice safely.<sup>1</sup> Apart from using simulation in educational practices for healthcare professionals, simulation potentially prepares ways in which the community responds to critical events (eg, using an automated external defibrillator).<sup>2</sup> Evidence on healthcare simulation has seen rapid growth, and much of the evidence has developed in the Western context. The authors of these articles are experts in healthcare simulation from credible professional organisations. Their projects have been developed for emergency medicine<sup>3–5</sup> and surgery.<sup>6,7</sup> Limited projects focus on the scope and blueprints, its potentials and advancements, especially in the educational perspective.<sup>8–10</sup>

Since 2008, the School of Nursing & Health Studies has integrated high-fidelity simulators with scenario-based simulation training into full-time nursing programmes in the Open University of Hong Kong to enhance nursing students' clinical competence. Subsequently, administrators and stakeholders must see proof that the substantial investment in simulation technology leads to desired outcomes, such as employers' reputation in the public and private sectors, the efficiency that the learning benefits for nursing students outweighed the costs.

There are three categories of syllabus contributing to a 5-year full-time nursing bachelor programme curriculum, including therapeutic nursing, clinical practicum and nursing professional development. The current simulation component consolidates what has taught in therapeutic nursing lectures to apply them in respective scenario-based simulation training among tutorial activities. However, various modalities, such as hybrid and patient-focused simulation, are unexplored in clinical practicum replacement or nursing professional development.

In therapeutic nursing courses, the simulation training syllabus was set up in 2007 by only two nursing faculties, who had attended a 1-week intensive overseas training in simulation, formed a simulation workgroup. The simulation training has been conducting for about 10 years with the expanded workgroup of 10 faculties. The workgroup has been accumulating simulation experiences for teaching and learning through trial and error, and research is vital for healthcare simulation to achieve excellence. However, this recognition extends beyond the capacities of a simulation workgroup of nursing faculty members in the School. A consensus on the priorities of healthcare simulation research based on the importance of evidence and feasibility in the local context must be identified.

The school's simulation workgroup seeks to answer the research question (RQ): 'What RQs and themes would comprise the school-based research agenda for healthcare simulation for nursing education?' The agenda may express a narrow view and offer simulation ideas, which may only be limited to the practices at that university. We hope that the process by which we have created the research agenda may offer guidance and discussion to other organisations involved in simulation-based education. The paper reports the consensus process, scoring methods and priority of areas.



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## METHODS

We adopted a modified Delphi process to reach a consensus in a total of seven rounds done in person and via surveys.<sup>6 11</sup> The Delphi approach<sup>6 7</sup> is useful for soliciting group opinions from a panel of experts for open interpretation through rounds of investigation. With full support from a visiting professor, adopting a modified Delphi process to create a school-based research agenda for 5-year planning has been conducted.

## Participants

With full grant support from the Research Grants Council of the Hong Kong Special Administrative Region, China, a panel was 11. It consisted of 10 nursing faculty members of the simulation workgroup, who has been teaching with simulation for more than 5 years to formulate a healthcare simulation plan and a visiting Professor Debra Nestel from Australia, who is experienced in healthcare simulation to guide the project.

## Data collection

The period for data collection was from August 2017 to March 2019. Round 1: with the RQ in mind, we independently generated as many questions as possible relevant to our interests in healthcare simulation research. We then met for a 2-day workshop in December 2017 and ran through Round 2–4.

Round 2: the questions from round 1 were pooled and analysed during the workshop's first day. This initial analysis was conducted in groups of three or four. Subsequently, we shared topics for identifying themes and subthemes. Round 3: we compared our agenda against other published research agendas, which led to further questions being added. Round 4: on the second day of the workshop, we compiled a list of questions, eliminating duplicates and examining the language used in each question to avoid cultural differences or misinterpretation.

From rounds 5–7, two identified researchers met to work out two surveys to produce the research agenda's final product. Round 5: two researchers refined the questions and finalised the agenda in the following 3 months via two times of face-to-face meetings. Round 6: we selected 10 of the most critical questions from the finalised agenda in round 5 via the first survey. Round 7: we rated the top 10 selected questions from round 6 from 1 to 10 based on their importance via the second survey.

## Data analysis

The pooled questions were critically analysed using an inductive approach to identify the school's strengths and critical contributions. The selected researchers improved questions in light of recent local developments in simulation-based education. Thus, by highlighting the strengths and acceptability in the existing literature, the established researchers could take advantage of the breadth and depth of insights into create RQs on the topic through synthesis and consensus.

## Ethics

Eleven participants authored the article; therefore, human research ethics approval was not indicated.

## RESULTS

In round 1, 112 questions were generated by 10 faculty members. The questions reflected the faculty members' expertise, the current research trends in healthcare simulation for nursing education and the questions' relevance to the future development of the school. The questions were not categorised.

## Box 1 Top 10 important questions

1. What frameworks inform curriculum design using simulation?
2. How can simulation be incorporated into clinical placements to enhance students' learning?\*
3. Can simulation be used for the certification of Registered Nurse?
4. To what extent can simulation substitute clinical placement?
5. How can the effectiveness of simulation as substituted clinical placement hours be evaluated?
6. What are the challenges to using simulation to replace clinical placement hours?
7. How can the challenges of using simulation to replace clinical placement hours be overcome?
8. How can simulation enhance nursing role transitions?
9. How can we optimally brief participants in simulations?
10. How can we optimally debrief participants in simulations?

\*The highest priority.

In round 2, the questions were allocated to topics by three groups of faculty members, so that different topics were generated in the three groups for further analysis. Additional questions were generated in each group according to topics. The topics were then reviewed to create more directed higher level themes (n=3) and subthemes (n=5). Three higher level themes have been identified: (1) embedding simulation into the baccalaureate in nursing curriculum, (2) designing effective simulation-based education and (3) simulation education in the broader world (adolescents). The three themes can be categorised into two significant areas: simulation in an educational setting and simulation being used in community settings.

In round 3, we compared our questions against those in other published research agendas,<sup>7 9 12</sup> which led to 12 additional questions. These questions were allocated to their respective themes and subthemes.

In round 4, we started with 112 questions that had been allocated to their themes and subthemes. Under the small group discussion, irrelevant questions and duplications were eliminated, similar questions were merged, and the language used in each question was reconsidered. For example, some questions were expanded, whereas others were simplified. The final number of questions was reduced to 52.

In round 5, two researchers further refined the questions, double checked for duplication and finalised the agenda.

In round 6, we voted on the 10 most important questions regarding nursing education's healthcare simulation needs.

In round 7, we voted again to identify the highest priority out of the 10 most important questions in [box 1](#). Finally, 6 out of 10 faculty members agreed on the question, 'How can simulation be incorporated into clinical placements to enhance students' learning?'

## DISCUSSION

The previous research agendas remained generic of simulation components.<sup>8–10</sup> At the same time, ours focused on the current simulation improvement with visions for future development to replace clinical placement hours, target new simulation modalities for learning enhancement and extend simulation training among adolescents in the community. The final list of questions compares to other published and reviewed research agendas.<sup>7 9 12</sup> We found similarities and differences that can

provide translational values to other nursing schools in Hong Kong and other countries. Therefore, research topics on instructional design, such as briefing and debriefing, and measuring outcomes for effective simulation-based education are similar to international perspectives.

The use of simulation should not be limited to healthcare professionals' education. Incorporating simulation in the community is a relatively new concept in promoting health advocacies to individuals in the community (eg, smoking cessation and handling adolescents' behavioural problems with parents). The evidence of clinical settings and society using simulation in healthcare education also motivates the governing body to impose additional resources and funding to encourage further development of simulation-based education.

## LIMITATIONS AND CONCLUSION

The research agenda aims to improve healthcare simulation's clarity and comparability for nursing education in Hong Kong in a 5-year plan. This agenda is being implemented in one university in Hong Kong to focus on the university's needs. Thus, the agenda may express a narrow view and offer simulation ideas that may only be limited to the practices at that university. Nevertheless, we hope that the process by which we have created the research agenda may be relevant to other organisations involved in simulation-based education.

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**Contributors** All listed eleven authors on the title page meet the criteria for authorship and have approved the manuscript as the final article. SLW, B-KG, DN: Conceptualisation, methodology, writing-review and editing. JHMC, APHC, CYCC, CKMF, CYL, MYTT, CKYL, AYKT: Investigation, data analysis and interpretation. DN: Visualisation and supervision.

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## REFERENCES

- 1 Jeffries PR, Dreifuerst KT, Kardong-Edgren S, *et al*. Faculty development when initiating simulation programs: lessons learned from the National simulation study. *J Nurs Regul* 2015;5:17–23.
- 2 Cheung CF. Public preparedness for terrorist attacks, 2018. Available: <https://www.legco.gov.hk/research-publications/english/essentials-1718ise05-public-preparedness-for-terrorist-attacks.htm>
- 3 Bond WF, Lammers RL, Spillane LL, *et al*. The use of simulation in emergency medicine: a research agenda. *Acad Emerg Med* 2007;14:353–63.
- 4 Spillane L, Hayden E, Fernandez R, *et al*. The assessment of individual cognitive expertise and clinical competency: a research agenda. *Acad Emerg Med* 2008;15:1071–8.
- 5 Griswold S, Fralliccardi A, Boulet J, *et al*. Simulation-based education to ensure provider competency within the health care system. *Acad Emerg Med* 2018;25:168–76.
- 6 Stefanidis D, Arora S, Parrack DM, *et al*. Research priorities in surgical simulation for the 21<sup>st</sup> century. *Am J Surg* 2012;203:49–53.
- 7 Johnston MJ, Paige JT, Aggarwal R, *et al*. An overview of research priorities in surgical simulation: what the literature shows has been achieved during the 21<sup>st</sup> century and what remains. *Am J Surg* 2016;211:214–25.
- 8 Dieckmann P, Phero JC, Issenberg SB, *et al*. The first research consensus Summit of the Society for simulation in healthcare: conduction and a synthesis of the results. *Simul Healthc* 2011;6 Suppl:S1–9.
- 9 Issenberg SB, Ringsted C, Østergaard D, *et al*. Setting a research agenda for simulation-based healthcare education: a synthesis of the outcome from an Utstein style meeting. *Simul Healthc* 2011;6:155–67.
- 10 Nestel D, Watson M, Marshall SD. *A national research agenda for healthcare simulation: preliminary report*, 2014: 1–8.
- 11 Hsu CC, Sandford BA. The Delphi techniques: making sense of consensus. *Pract Assess Res Evaluation* 2007;12:10 <http://pareonline.net/getvn.asp?v=12&n=10>
- 12 Nestel D, Kelly M. Strategies for research in healthcare simulation. In: Nestel D, Kelly M, Jolly B, *et al*, eds. *Healthcare simulation education: evidence, theory and practice*, 2018: 37–44.