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# Lessons learned through developing and implementing simulation-based education in nursing education programmes in sub-Saharan Africa

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## ABSTRACT

Based on the authors' experiences, this paper aims to describe and reflect on the project of developing and implementing simulation-based education in two nursing education programmes in Tanzania and Madagascar.

The project lasted from August 2017 to December 2019. The essential aspects that contributed to the project's achievements were the school's interest in developing and implementing simulation-based education and the many opportunities for sharing theoretical knowledge and practicing simulation. Notably, the teachers adapted simulation-based education as a pedagogical method to their own context, developing scenarios related to their local culture and national curriculum. In the debriefing session, the teachers asked open-ended questions to promote reflection, however, they mostly used directive feedback to highlight performance issues and correct performance gaps. The students also expected directives to learn from their mistakes.

Overall, the reflection on the experience may provide new insights into developing and implementing simulation-based education in low-resource settings.

## 1. Introduction

This paper describes and reflects on experiences from a project with a focus on developing and implementing simulation-based education in two nursing education programmes in Tanzania and Madagascar. The first and last author, nurse teachers from a Norwegian university, initiated and coordinated the project and provided academic competence in simulation-based education as they both have extensive experience using simulation-based education in a Norwegian education context. The Norwegian nurse teachers also have work and research experience in low-income countries. This paper is based on the authors' experiences throughout the project as well as research conducted during the project period that explored nurse students' and teachers' experiences with simulation-based education (Bø et al., 2022; Tjoflåt et al., 2021).

## 2. Background

Two nursing education programmes in sub-Saharan Africa – one situated in a rural area in Tanzania and the other in a semi-urban area in the midland of Madagascar – and a Norwegian university embarked on

the project *Implementing simulation-based education in two nurse educational programmes in Tanzania and Madagascar*. The collaboration with the nursing school in Tanzania has lasted for nearly two decades, while that in Madagascar has been in operation since 2012.

The overall aim of the project was to develop and implement simulation-based education as a pedagogic method in two nursing education programmes in Tanzania and Madagascar. Throughout the project, the concept of *simulation* has been defined according to Jeffries (2005, s.97):

[S]imulations are defined as activities that mimic the reality of a clinical environment and are designed to demonstrate procedures, decision making, and critical thinking through techniques such as role playing and the use of devices such as interactive videos or mannequins.

Simulation as a pedagogic method enables students to learn how to reconcile theory with practice through different scenarios (Jeffries, 2012). Simulation-based education is a pedagogical approach to learning that addresses these requirements and has proven valuable and effective for improving clinical students' learning (Alanazi et al., 2017; Sandler et al., 2015; Warren et al., 2016).

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The project lasted from August 2017 to December 2019 and included two phases: (1) *a preparation phase* to plan the project and obtain permission for the project and (2) *an implementation phase*. The implementation phase comprised the five following components: (1) theoretical and practical sessions in simulation-based education conducted by the first and last author, (2) a simulation workshop in Madagascar involving four teachers from Madagascar and two from Tanzania, (3) simulation sessions conducted by teachers in Tanzania and Madagascar supervised by the Norwegian teachers and (4) studies exploring students' and teachers' experience with simulation-based education (Bø et al., 2022; Tjøflåt et al., 2021). A final implementation phase (5) included simulation sessions conducted by the Tanzanian and Malagasy teachers, in which the Norwegian teachers had a passive observer role.

In this project, we used low-fidelity simulation and the scenarios developed for the local setting involved simulated patients imitating clinical nurse care situations – that is, the students acted as patients or relatives in the different scenarios (Lioce et al., 2020). A teacher facilitated the simulation-based education, which followed three phases: (1) briefing, (2) scenario playing and (3) debriefing. According to the literature, the debriefing is a formal, collaborative, reflective process within the simulation learning activity and is crucial for learning (INACSL Standards of Best Practice, 2016; Lioce et al., 2020). While it is still not known which debriefing strategy best supports the learning outcomes (Decker et al., 2013; Nestel et al., 2018), it is well documented that an important role for the teacher in the debriefing phase is to promote reflection among the students (Husebø et al., 2015; Lestander et al., 2016). In the current project, the reflective learning cycle proposed by Gibbs (1988), which has its roots in cognitivism, including affective and social aspects of learning, was used during the debriefing phase. The reflective cycle comprises six stages to guide learners' reflection following a variety of educational methods, including simulation, and can inform debriefing practice (see Table 1).

Another aspect of the debriefing phase is to provide the students with information about their performance in the form of directive feedback to correct performance gaps. Nestel et al. (2018) report that this feedback is most effective if the knowledge gap is obvious, and the students are struggling with a specific procedure.

### 3. Setting

The nursing schools in Tanzania and Madagascar provide diploma programmes in nursing that are registered, approved, and regulated by the national curriculum of their country. In Madagascar, the curriculum is conducted in French and Malagasy, while in Tanzania, the curriculum is in English. Simulation as a pedagogic method is explicitly described as one of the teaching methods to be used in both curricula. Regarding teaching facilities, the schools had skills laboratories with some equipment where skills training took place. When the project started, simulation-based education was not among the teaching methods used within the nursing educational programmes, which aligns with research showing that there is limited use of simulation-based education in low-income countries (Kim, 2017). Prior to the project, most of the teaching in the two nursing schools was carried out in classrooms, with the teacher's transferring knowledge to the students' using lectures as a pedagogic method. However, the students also spent time in the skills laboratories to train nursing skills and were encouraged to make presentations on specific themes and share them with their peers.

**Table 1**  
Gibbs (1988) reflective cycle.

Gibbs (1988) reflective cycle					
1	2	3	4	5	6
Describing	Involving feelings	Evaluating	Analysing	Concluding	Planning for future actions

The situation of the nursing programmes involved in this project aligns with research reporting that nursing and midwifery education programme curricula in sub-Saharan African countries are static and rigid, employing traditional ways of delivering knowledge and skills (Bvumbwe & Mtshali, 2018). A Lancet commission, however, highlights how health education in sub-Saharan Africa can be transformed through a focus on achieving active and problem-based learning as well as early clinical exposure (Kruk et al., 2018).

## 4. Development and implementation of simulation-based education

### 4.1. Planning phase

Before starting the project, the first and last author contacted the management of the two nursing schools in Tanzania and Madagascar to explore their interest in developing and implementing simulation-based education in their nursing education programmes. The schools welcomed the project, because simulation as a pedagogic method was described as one of the teaching methods to be used in the curriculum. In addition, both institutions had upgraded their skills laboratories with some equipment. The two nursing schools also knew the Norwegian teachers well due to a long-term exchange programme for nursing students and former collaborative projects. The project also involved research aspects as it followed and documented nursing students' and teachers' experiences with the implementation of simulation-based education in the two nursing schools. Permission to conduct research was obtained from the Norwegian Centre for Research Data (No: 55230), the National Institute for Medical Research (NIMR/HQ/R.8c/Vol.11/996) in Tanzania and the Tanzanian Commission for Science and Technology (No: 2019-77-NA-2017-206). In Madagascar, the management of the nursing school approved the study, and no further permission was necessary. The Laerdal Foundation for Acute Medicine funded the project.

### 4.2. Implementation phase

During the implementation phase, the Norwegian teachers who initiated and coordinated the project visited Tanzania four times (October 2017, April 2018, November 2018 and December 2019) and Madagascar three times (April 2018, May 2019 and November 2019). The visits lasted from three days to one week. During this phase, a workshop was carried out in Madagascar and attended by four teachers from Madagascar, two teachers from Tanzania and two teachers from Norway.

### 4.3. First visits to Tanzania and Madagascar

The first visits to the nursing schools started with a theoretical presentation for all the involved teachers about simulation as a pedagogic method. The presentation was based "Simulation in Nursing Education" (Jeffries, 2012) and "INACSL Standards of Best Practice" (2016), although new "INACSL Standards of Best Practice" was presented in 2021 (Watts et al., 2021). The theoretical session was followed by simulation sessions for the nursing students in the two nursing schools. The first simulation sessions were mainly facilitated by one of the Norwegian teachers. After observing the Norwegian teacher's facilitation, a few simulation sessions were facilitated by teachers from Tanzania and Madagascar with support and guidance from the Norwegian teacher. The focus in the guidance from the Norwegian teachers was mainly on the debriefing practices encouraging the teachers from Tanzania and Madagascar to ask open-ended questions. The scenarios simulated were developed by the Norwegian teachers, then shared and adapted by the teachers from Tanzania and Madagascar to ensure that the scenarios were in line with the local context, the curriculum and the nursing students' level of competence.

#### 4.4. Workshop

Eight teachers (four from Madagascar, two from Tanzania and two from Norway) participated in a workshop in Madagascar in April 2018. The aim of the workshop was to strengthen the teachers' competence in simulation-based education, develop culturally sensitive and relevant scenarios for the educational settings and give the two nursing schools a possibility to share knowledge and experience related to simulation-based education. The workshop was interactive, with a review of the theoretical aspects related to simulation-based education followed by simulation activities. The Norwegian teachers led the workshop and provided supervision and support during the practical simulation sessions. During the workshop, the teachers developed their own scenarios and conducted simulation sessions based on their scenarios, both acting as facilitators and playing the different roles in the scenarios. "INACSL Standards of Best Practice" (2016) guided the participants through the development of the scenarios, as well as points related to the briefing, such as confidentiality, learning outcomes, equipment and different roles in the scenarios, and points to consider during the acting of the scenario and the debriefing. The participants used the reflective cycle outlined by Gibbs (1988) in the scenario debriefing.

#### 4.5. The second and third visits to Tanzania and Madagascar

During the Norwegian teachers' second visit to Madagascar (May 2019) and second and third visits to Tanzania (April and November 2018), the Malagasy and Tanzanian teachers facilitated the simulation sessions. The scenarios covered the following topics: management of postpartum bleeding in the labour ward, pre-operative information to a patient going to the operating theatre and nursing care to a patient with signs of sepsis in an emergency room. The topics in the scenarios were relevant for the curriculum and adapted to the local context. The Norwegian teachers provided feedback and supervision mainly linked to the debriefing practice. They were asked to facilitate one or two simulation sessions and emphasise certain important points related to the simulation-based education raised by the local teachers.

In the briefing phase, the Malagasy and Tanzanian teachers were observed while they instructed the students chosen to act as nurses about what they were supposed to do and how they should perform in the scenario. During the follow up, the Norwegian teachers guided the teachers to let the students find out by themselves how they should act and respond in the scenario. In the debriefing phase, the teachers followed the six stages outlined by Gibbs (1988). They asked the students what they felt in the scenario, what went well and what could be improved. At the end of the debriefing, the teachers often gave the students instructions about what they had missed in the scenarios and emphasised points to improve. If other teachers had observed the simulation sessions, they were also asked to bring forward their comments concerning points of improvement.

#### 4.6. The final visits to Tanzania and Madagascar

The final visits for the project took place in November 2019 in Madagascar and December 2019 in Tanzania. The teachers from the two nursing schools facilitated the simulation sessions, while the two Norwegian teachers observed the sessions. Because most of the simulation sessions at the nursing school in Madagascar were conducted in Malagasy, a translator supported the Norwegian teachers during the sessions.

In both Tanzania and Madagascar, the teachers selected the scenarios to be simulated. In Madagascar, the teachers used scenarios developed during the implementation phase related to post-operative care and the care of a patient with sepsis. In Tanzania, the teachers had developed two new patient scenario cases related to a theoretical module that the nursing students were presently taking. These scenarios had focus on (1) management of a women in labour with shoulder dystocia and (2) management of asphyxiated new-born baby. Relevant learning

outcomes for the two scenarios, see Table 2.

One student acted as a women in labour and an obstetric birthing torso was utilized to simulate shoulder dystocia. A manikin was used to simulate the asphyxiated new-born baby and a standardized patient simulating the mother in the scenario.

The students were informed about the simulation scenarios one to two days before the simulation took place. The teachers believed that if the students were prepared, they would perform better, reflect more and achieve a higher learning outcome (McDermott et al., 2021).

The simulated patient cases followed the INACSL (2016) template introduced at the beginning of the project, which covered a briefing phase including the presentation of (1) learning outcomes, (2) necessary equipment, (3) a report to the students before the simulation, (4) the students' role in the scenario, both the acting and observers' roles and (5) descriptions of the roles. In addition, the patient cases included descriptions of the patients' vital signs in the scenario, how the patients should act as well as the nursing students' expected interventions. During the briefing phase, all the students received information about the patient case they should simulate and the equipment available. Learning outcomes and different roles were distributed among the students. The students who were going to play nurse/midwives in the scenarios left the room before additional instructions were given to the students who acted as a patient and a relative in the scenarios.

The teachers in Tanzania had outlined specific questions according to the reflective cycle proposed by Gibbs (1988) to be used in the debriefing of the scenarios (see Table 3).

During the different debriefing sessions, the teachers asked questions related to each stage of the reflective cycle proposed by Gibbs (1988). The students answered, but the teachers did not then pose follow-up questions. In Madagascar, the debriefing phase included questions related to how the students felt during the simulation session and what the strong points and points to improve were, with some follow-up questions asked by the teachers.

At the end of the visits in Tanzania and Madagascar, the authors clarified how the two nursing schools further planned to integrate and use simulation-based education in their nursing training. Both teachers in Tanzania and Madagascar indicated that simulation is a good pedagogic method for learning that complements theory and supports the students' education. One teacher said, "The simulation helps the students to stick the theory into the brain and prepares the students for internships". The teachers in Madagascar explained that they planned to simulate four times a year during the first and second year of the nursing education programme before the students enter their internships. In the nursing school in Tanzania, the teachers wanted simulation sessions to replace lectures and presentations that students normally conduct in some theoretical modules as they believed that the simulation sessions would strengthen students' learning outcomes and be useful as a preparation for the Objective Structured Clinical Exam (OSCE).

**Table 2**  
Scenarios and learning outcomes (Tanzania).

Scenarios and learning outcomes (Tanzania)	
Scenario	Management of a woman in labour with shoulder dystocia
Learning outcome	Demonstrate a thorough assessment to identify stage of the women's labour Recognize the serious situation Implement correct interventions Communicate and work effectively in a team
Scenario	Management of asphyxiated new-born baby
Learning outcome	Demonstrate a quick assessment to identify needs of the new-born baby Understand the serious situation and implement correct interventions Communicate and work effective in a team

**Table 3**  
Questions guide for debriefing session.

Question guide for debriefing session	
General opening questions	How did you feel during the care of the patient? What do you think went well? If you come across a similar case, how would you handle the situation differently?
Scenario-specific questions	What were the potential causes for symptoms the patient was experiencing? What did you identify as the actual cause? What did you communicate to your co-worker? What knowledge have you acquired in your study or in clinical practice that helped you in this scenario? What measure did you take to ensure the patient was comfortable?
Wrap-up questions	What have you learned from this simulation? How can you transfer this learning to your future practice? Is there anything else you want to discuss?

#### 4.7. Reflection on the experience of developing and implementing simulation-based education

The final visits showed that the teachers from the two nursing schools in Tanzania and Madagascar independently conducted simulation-based education and had theoretical and practical knowledge about simulation-based education as a pedagogic method. The studies carried out during the project period revealed that both the students and teachers emphasised that simulation is a valuable pedagogic method for learning, improving students' competence and preparing nursing students for future professional practice (Bø et al., 2022; Tjoflåt et al., 2021).

The teachers followed the structure in the simulation and conducted briefings and debriefings, and the Tanzanian teachers also developed their own scenarios and debriefing questions. The teachers' experiences related to simulation as a pedagogic method revealed that it was essential for the teachers in both Madagascar and Tanzania to facilitate simulation sessions correctly and to have good knowledge of the subject to be simulated (Tjoflåt et al., 2021).

In the briefing phase, observation during the final visit revealed that the teachers still gave some leading instructions to the students who were going to play in the scenario. At the end of the project, the teachers were familiar with the structure of the reflective cycle proposed by Gibbs (1988). However, during the debriefing phase, the feedback was rather directive, following the written guide to correct students' performance and address specific issues. While the students expressed clearly that they wanted to be informed about their weaknesses in the simulation sessions to improve, the responses from the teachers should be conducted in a supportive way. Open-ended questions were asked during the debriefing phase, which Husebø et al. (2015) have reported is important to encourage reflection.

We will now discuss the main aspects of how the simulation-based education was developed as well as the plans for integration in the two nursing educational programmes.

First, an essential element for the project's achievements was that the project provided opportunities to share knowledge and revise theory about simulation as a pedagogic method as well as to supervise the practical sessions. Theoretical knowledge about simulation was repeated several times, and hand-outs and relevant research articles about simulation were provided. At the beginning of the project, the Norwegian teachers acted as role models for the facilitated simulation sessions, providing the local teachers with possibilities to replicate similar activities (Tjoflåt et al., 2021).

An interesting aspect of this project was that the teachers adapted simulation-based education as a pedagogical method to their own context, developing their own scenarios related to their local culture and national curriculum. They also made specific adaptations regarding how the debriefing should be carried out within their own setting. Literature

on simulation-based education emphasises that reflection in debriefing is essential for learning (Husebø et al., 2015; Nestel et al., 2018). Although the teachers in the project encouraged reflection by using open-ended questions in the debriefing, their main approach was directive feedback related to performance issues and providing specific information to correct performance gaps. The debriefing phase was dominated by teachers asking students questions and expecting them to come up with the correct answer. The students also expected directive feedback to learn from their mistakes (Bø et al., 2022). It is not known how the teachers' selected debriefing method in this project will influence the students' learning, and more research is needed to explore this topic. There is still little evidence concerning which debriefing method optimises learning in simulation-based education (Nestel et al., 2018). In this project, the teachers may have primarily used directive feedback in the debriefing phase, because this way of transferring knowledge is familiar to them as most teaching in the nursing schools takes place through lectures. Simulation as a pedagogic method was also a new method for the teachers.

Another important element for the outcome of the project was that the teachers in Madagascar and Tanzania were motivated to learn about simulation-based education. During the project period, the teachers realised that simulation was a valuable method for strengthening theory and practice and preparing students for their clinical practice (Tjoflåt et al., 2021). Other aspects that facilitated the outcome were that both schools had skills laboratories in which the students could practice simulation.

Both nursing schools had made plans on how to integrate simulation into their nursing training, but to replace lectures with simulation without a theoretical foundation is not in line with best practice (McDermott et al., 2021). However, the teachers were concerned about how to integrate simulation into an already-tight timetable with a high number of students compared to teaching resources (Tjoflåt et al., 2021). Research has highlighted similar barriers to implementing simulation-based education in low-resource settings (Seethamraju et al., 2022). In general, barriers to the implementation and integration of simulation-based education have not yet been fully explored in the literature (Ferguson et al., 2020; Hosny et al., 2017). Further research is necessary to explore how simulation-based education has been implemented and sustained in the nursing schools in Tanzania and Madagascar.

## 5. Conclusion

This paper highlights and discusses some reflections based on the authors' experiences of developing and implementing simulation-based education in two nursing education programmes in sub-Saharan Africa. The essential elements for the project's achievements included the nursing education programmes' interest in developing and implementing simulation-based education and the many opportunities for sharing theoretical knowledge about simulation and practicing simulation. It should also be noted that the teachers adapted simulation-based education as a pedagogical method to their own context by developing scenarios related to their local culture and national curriculum. In the debriefing, the teachers asked open-ended questions to promote reflection, but they mostly used directive feedback to highlight performance issues and to correct performance gaps. The students also expected directives feedback to learn from mistakes.

Overall, the reflection on the experience may provide new insights into developing and implementing simulation-based education in low-resource settings.

## Authors' contributions

Project plan: IT and BB, Manuscript draft: IT.

Critical comment and revisions to the paper for important intellectual content:



BPM, HR and BB; All the authors meet the criteria for authorship and have approved the final article.

## Declarations

**Ethical approval and consent to participate:** The research and ethical permits were granted by the National Institute of Medical Research (NIMR) (No: NIMR/HQ/R.8c/Vol. 11/996), Tanzania, and by the Tanzania Commission for Science and Technology (COSTECH) (No: 2019-77-NA-2017-206), Tanzania. The study was also approved by the Norwegian Center for Research Data (No: 55230). In Madagascar, the management of the nursing schools approved the study, and no further permission was required

**Consent for publication:** Not applicable

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## References

- Alanazi, A. A., Nicholson, N., & Thomas, S. (2017). The use of simulation training to improve knowledge, skills, and confidence among healthcare students: A systematic review. *The Internet Journal of Allied Health Sciences and Practice*, 15, 1–24. <https://doi.org/10.46743/1540-580X/2017.1666>.
- Bvumbwe, T., & Mtshali, N. (2018). Nursing education challenges and solutions in Sub Saharan Africa: An integrative review. *BMC Nursing*, 7(3). <https://doi.org/10.1186/s12912-018-0272-4>.
- Bø, B., Madangi, B. P., Ralaitafika, H., Ersdal, H. L., & Tjoflåt, I. (2022). Nursing students' experiences with simulation-based education as a pedagogic method in low-resource settings: A mixed-method study. *Journal of Clinical Nursing*, 31(9–10), 1362–1376. <https://doi.org/10.1111/jocn.15996>.
- Decker, S., Fey, M., Sideras, S., Caballero, S., Rockstraw, L., Boese, T., Franklin, A. E., Gloe, D., Lioce, L., Sando, C. R., Meakim, C., & Borum, J. C. (2013). Standards of best practice: simulation standard VI: The debriefing process. *Clinical Simulation in Nursing*, 9(6), 26–29. <https://doi.org/10.1016/j.ecns.2013.04.008>
- Ferguson, J., Astbury, J., Willis, S., Silverthorne, J., & Schaeuble, E. (2020). Implementing, embedding and sustaining simulation-based education: What helps, what hinders. *Medical Education*, 54, 915–924. <https://doi.org/10.1111/medu.14182>.
- Gibbs, G. (1988). *Learning by doing. A guide to teaching and learning methods*. London: Further Education Unit at Oxford Polytechnic.
- Hosny, S. G., Johnston, M. J., Pucher, P. H., Simon, E., & Darzi, A. (2017). Barriers to the implementation and uptake of simulation-based training programs in general surgery: A multinational qualitative study. *The Journal of Surgical Research*, 220, 419–426. <https://doi.org/10.1016/j.jss.2017.07.020>
- Husebø, S. E., O'Regan, S., & Nestel, D. (2015). Reflective practice and its role in simulation. *Clinical Simulation in Nursing*, 11, 368–375. <https://doi.org/10.1016/j.ecns.2015.04.005>
- INACSL Standards Committee. (2016). INACSL standards of best practice: Simulation SM Simulation design. *Clinical Simulation in Nursing*, 12(S), 5–12. <https://doi.org/10.1016/j.ecns.2016.09.005>
- Jeffries, P. R. (2005). A framework for designing, implementing, and evaluating: Simulations used as teaching strategies in nursing. *Nursing Education Perspectives*, 26(2), 96–103.
- Jeffries, P. R. (2012). *Simulation in nursing education: From conceptualization to evaluation* (2nd ed.). National League for Nursing. ISBN 978-1-934758-15-1.
- Kim, H. (2017). Experience of simulation-based training in a developing country. Simulation in healthcare. *The Journal of the Society for Simulation in Healthcare*, 12(3), 202. <https://doi.org/10.1097/SIH.0000000000000203>.
- Kruk, M. E., Gage, A. D., Arsenault, C., Jordan, K., Leslie, H. H., Order-DeWan, S., ... Pate, M. (2018). High-quality health systems in the Sustainable Development Goals era: Time for a revolution. *The Lancet Global Health*, 6(11), e1196–e1252. [https://doi.org/10.1016/S2214-109X\(18\)30386-3](https://doi.org/10.1016/S2214-109X(18)30386-3)
- Lestander, Ø., Lehto, N., & Engström, Å. (2016). Nursing students' perceptions of learning after high fidelity simulation: Effects of a three-step post-simulation reflection model. *Nurse Education Today*, 40, 219–224. <https://doi.org/10.1016/j.nedt.2016.03.011>.
- Lioce, L. (Ed.), Lopreiato, J. (Founding Ed.), Downing, D., Chang, T.P., Robertson, J.M., Anderson, M., Diaz, D.A., Spain, A.E. (Assoc. Eds.) and the Terminology and Concepts Working Group (2020). *Healthcare Simulation Dictionary - Second Edition*. Rockville, MD: Agency for Healthcare Research and Quality, AHRQ. Publication No. 20-0019. <https://doi.org/10.23970/simulationv2>.
- McDermott, D. S., Ludlow, J., Horsley, E., & Meakim, C. (2021). Healthcare simulation standards of best practice™ prebriefing: Preparation and briefing. *Clinical Simulation in Nursing*, 58, 9–13. <https://doi.org/10.1016/j.ecns.2021.08.008>
- Nestel, D., Kelly, M., Jolly, B., & Watson, M. (2018). *Healthcare simulation education, evidence, theory and practice*. Wiley Blackwell.
- Seethamraju, R., Stone, K. P., & Shepherd, M. (2022). Factors affecting implementation of simulation-based education after faculty training in a low-resource setting. *Simulation in Healthcare*, 17(1), e113–e121. <https://doi.org/10.1097/SIH.0000000000000549>.
- Sundler, A. J., Pettersson, A., & Berglund, M. (2015). Undergraduate nursing students' experiences when examining nursing skills in clinical simulation laboratories with high-fidelity patient simulators: A phenomenological research study. *Nurse Education Today*, 35(12), 1257–1261. <https://doi.org/10.1016/j.nedt.2015.04.008>
- Tjoflåt, I., Koyo, S. L., & Bø, B. (2021). Simulation-based education as a pedagogic method in nurse education programmes in sub-Saharan Africa – Perspectives from nurse teachers. *Nurse Education in Practice*, 52, Article 103037. <https://doi.org/10.1016/j.nepr.2021.103037>.
- Warren, J. N., Luctkar-Flude, M., Godfrey, C., & Lukewich, J. (2016). A systematic review of the effectiveness of simulation-based education on satisfaction and learning outcomes in nurse practitioner programs. *Nurse Education Today*, 46, 99–108. <https://doi.org/10.1016/j.nedt.2016.08.023>
- Watts, P. I., Rossler, K., Bowler, F., Miller, C., Charnetski, M., Decker, S., ... Hallmark, B. (2021). Onward and upward: Introducing the healthcare simulation standards of best practice™. *Clinical Simulation in Nursing*, 58, 1–4. <https://doi.org/10.1016/j.ecns.2021.08.006>