HUMAN, TECHNOLOGIES AND QUALITY OF EDUCATION, 2023
https://doi.org/10.22364/htqe.2023.38

SIMULATED HOSPITAL FOR MEDICAL STUDENTS AS AN ESSENTIAL STEP TOWARDS QUALITY IN CLINICAL WORK AND PATIENT SAFETY

Madara Blumberga[1], Nora Jansone-Ratinika[2], Evita Grigoroviča[1], Raimonds Strods[2], Andreta Slavinska[1], Māris Brants[2]

[1] Rīga Stradiņš University Medical Education Technology Centre, Latvia
[2] Rīga Stradiņš University Centre for Educational Growth, Latvia

ABSTRACT

Simulation-based education provides a transition from theory-based learning to the application of knowledge, skills, and attitudes in complex situations in conditions close to real healthcare facilities. In healthcare, a simulation-based learning approach provides the opportunity to learn skills in a safe environment and gain confidence in the students' abilities before working in a real clinical setting. In the academic year 2022/2023, for 2 weeks, the Rīga Stradiņš University (RSU) Medical Education Technology Centre (METC) in cooperation with the Department of Nursing and Midwifery implemented the concept of a simulated hospital to provide 114 international 3rd year students of the study programme "Medicine" with pre-clinical practice in a simulated environment in the fields of internal diseases and surgery. A simulated hospital is a concept in which the hospital environment is reproduced in the premises of the METC, encompassing 2 hospital wards, 6 patient rooms, 2 nursing stations, 2 medication rooms, a laboratory, and examination locations, as well as using 8 patient manikin and 38 simulated patients. Students provided a self-assessment of 64 skills (technical and non-technical) before and after pre-clinical practice using a scale from 1–5. Data were collected electronically and analyzed using IBM SPSS and compared statistically before and after the teaching intervention. Students demonstrated improvement in self-assessment of performance of all 64 skills. Students indicate that they not only learned new knowledge and skills, but also strengthened existing knowledge and skills. Students answer that they feel better prepared to work in a real clinical environment. One of the conclusions is that pre-clinical practice should be an integral part of the study process before working in a real clinical environment. that pre-clinical practice should be an integral part of the study process before working in a real clinical environment.

Keywords: *Clinical Skills, Higher Education, Medical Education, Self-assessment, Simulation-based Education, Simulated Hospital, Skills Monitoring*

Introduction

According to the research conducted by the market research company "Kantar" on the reputation of Latvian universities, Rīga Stradiņš University (RSU) has been recognised as a reputation leader for several years in a row (2017–2023), among higher education institutions in Latvia (Kantar), providing high-quality study process in more than 60 study programmes in the fields of healthcare and social sciences. The number of students at RSU exceeds 10,000, of which 27% are international students. Leading learning and teaching approach at RSU is student-centred and various initiatives are implemented and supported to ensure that academic staff acquire diverse learning and teaching strategies. The RSU Centre for Educational Growth holds a central role in developing the pedagogical competencies of the academic staff. The focus of the study process on the institutional level is on students' learning needs, achievable learning outcomes and the development of students' professionalism and personality, which is also supported by the student-academic staff ratio (14 to 1).

Simulation-based learning and teaching as one of the priorities of the RSU study process is mainly developed at the Medical Education Technology Centre (hereinafter – METC). The METC is the only simulation centre in Latvia and the largest in the Baltics. The METC aims to create and maintain a culture of simulation-based medical education (SBME) to ensure high-quality and safe skills training, professional competence development for healthcare and medical students and professionals. By offering modern simulation resources within a simulated learning environment, individuals are presented with a valuable opportunity to acquire the necessary knowledge, skills, and professional attitude required for the advancement of research and innovation in the domain of simulation-based medical education (Jain et al., 2023).

Simulation-based medical education

Simulation is an integral part of healthcare education in the 21st century. The authors of the study are in line with the definition that simulation-based medical education is "a technique that creates a situation or environment to allow persons to experience a representation of a real healthcare event for the purpose of practice, learning, evaluation, testing, or to gain an understanding of systems or human actions" (Lioce (Ed.), et al., 2020, p. 21). Whether it is separate skills training or complex patient care task management in teams, simulation gives learners a chance to learn in a safe environment where their own health risks related to giving care are limited and no harm is possible for the patient. Using high-fidelity simulation, educators have the capability to replicate a variety of patient scenarios, allowing students to enhance their nursing skills – cognitive, motor, and critical thinking skills – in a setting that poses no risk to patients (Hayden et al., 2014).

A simulation comprises three stages: prebriefing, situation and debriefing (Contributor, 2022).

Mentors, at the beginning of placement, start establishing a "Fiction Agreement" that allows students to take time to discern which things and situations are real and which are not, preparing students to immerse in a scenario (Rudolph et al., 2014).

Simulation is the bridge between the classroom and real-life situations at healthcare facilities.

Concept of a simulated hospital

Frequently, skills are instructed in isolation, and students are examined throughout diverse courses as discrete anatomical segments or physiological systems. Real hospitals and clinical environments are fast-moving, constantly changing, filled with heavy patient workloads and they often lack insufficient mentor support. (Kol et al., 2021). A simulated hospital approach impedes a student's ability to reason in a holistic manner, envision projective scenarios in the hospital environment, contemplate workflow strategies, appreciate the significance of effective communication, navigate multidisciplinary team dynamics, and effectively manage a diverse patient population. Higher education equips students with the necessary tools to provide the utmost care for patients, both during clinical placements and in their future workplaces. Amidst the COVID-19 pandemic, a novel idea was conceived at RSU METC to integrate a simulated hospital into the study curriculum, thereby serving as a preclinical practice component of the Medicine study programme. The fundamental concept of simulated hospitals revolves around immersing students in an authentic clinical environment to facilitate deep learning, ensuring their readiness for safe practice. Evidence gathered from international research has indicated that simulated hospitals and health services have a positive impact on student satisfaction and confidence levels, while also augmenting clinicians' perceptions of the students' work readiness (Parker, Grech, 2018).

With the aim of validating and refining students' technical and non-technical clinical skills as both are crucial when performing clinical work (Flin et al., 2008; "Healthcare Simulation at a Glance," 2019), an intensive, realistic, and immersive simulated hospital learning experience was arranged and integrated into the placement of medical students at RSU. The METC was transformed into a simulated clinical environment that assimilates simulated patients (hereinafter – patients), manikins, and simulation scenarios, supported by mentors and fully operational facilities authentic to a real hospital setting.

Simulated patients, or standardized patients, are individuals trained to portray patient histories, along with their emotional and physical states, for educational purposes (Nestel, 2014).

For a two-week period, regular task training rooms and hallways of the building were modified into two hospital wards. Each ward had a nursing station, three patient rooms, a medication/supply room, a dedicated area to bring and collect patients for radiology examination or surgery and a laboratory sample pick-up point. Each day students took care of four patient manikins and seven patients in each ward. In total, 38 patients with 27 different patient stories were incorporated into the simulated hospital. Patient stories were created in a way to provide students with internal medicine and surgical patient cases and to cover skills needed to be learned in the preclinical placement.

In consideration of the fact that this is the first time for students to experience a hospital setting in a learning context, the aim was to create narratives that are not borderlines, such as patients who are angry and potentially dangerous, or where patients would like to hug and keep their healthcare providers closer than needed.

Each patient had their own unique story and each one of them had a different emotional state – some were confused, scared, worried and almost ready to cry, and some were careless and lacked the understanding of their needs. Each patient's story was linked to specific skills that students needed to acquire while caring for the patient. The patient story was designed to address the complex needs of students, helping them develop new skills and improve existing ones. Each patient had their individual anamnesis, their own level of complicit in care, attached cannula, drainage bags, wounds, makeup to simulate bruises to support their story and make it possible for students to learn in the hospital-like environment.

The simulated hospital was organized in three shifts – morning, day and afternoon for 10 days. Patient rooms, medication/supply rooms, and the nursing station were designed to resemble a hospital down to the smallest detail. Manikin patients had vital signs monitors and there were frequent changes in them, for patients it was possible to check their weight and height as well as vital signs using manual tonometers and pulse oximeters. Medication could be administered via the required route. Task trainers, in conjunction with patients, and specially designed trainers were utilized to make the experience as authentic as possible. The same applies to bodily fluids and patient feeding. It was possible to collect urine and faeces samples, to feed patients via gastrostomy and nasogastric tubes. A wheelchair or a stretcher was used to transfer a patient to the examination or operating room. Every vial, ampule, and pill bottle was labelled with a specific medication name. Students had to match these with the names listed in the patients' documentation. All medications were simulated and safe to be injected in task trainers, pills were candies, and it was safe for patients to take them as prescribed.

As in a real hospital, the students had to attend not only to the patients, but also needed to organize logistics at the ward. Students were asked to fill in the clinical documentation to learn its importance and observe how time-consuming it might be. The primary document for managing patient tasks was the doctor's appointment log. This log outlined the tasks that students were required to perform with patients, including monitoring vital signs, taking blood samples, inserting or removing nasogastric tubes, positioning patients, and providing oral cavity care. To manage laboratory sample collection students needed to ensure the laboratory samples were taken correctly as required in the laboratory form and brought to the specific area dedicated for sample pick up. Results for vital signs were recorded in the early warning score tool. Essentially, every task performed with the patient needed to be documented. The acquisition of non-technical skills presents a formidable challenge, and frequently insufficient emphasis is placed on their instruction within the domain of healthcare education (Flin et al., 2008). During the simulated hospital, students had an opportunity to train the technical skills mentioned before and non-technical skills like time management, patient and care

task prioritising, communication with the patient and among team members. Communication training, which includes speaking with and listening to patients, involves complex skills. Studies have shown that communication is not adequately taught during undergraduate healthcare studies (Wershofen et al., 2016). Delegating tasks and dividing them was also a part of teamwork skills and various patient cases ensured students also practiced their problem-solving skills.

At the simulated hospital mentor availability gave more advantages to the students compared to the real hospitals where mentors must carry out their mentor roles while taking care of patients and managing the ward. Mentors were nurses with clinical experience and experience in mentoring students in a clinical environment.

When deciding what tools to use, setting up an IV line, preparing medication, going through patient documentation, students faced situations where they did not see an answer and could not manage the task, they were able to ask a mentor. Mentors lead students in the direction of correct answers or actions. From the start, it was decided that mentors would first try to use extra questions for guidance and give a chance for students to find the answer on their own. If guiding questions did not work, an answer was provided. In situations where it was necessary, mentors guided students step by step showed examples, and did the task together with students. Mistakes were not tallied. When they occurred, they were perceived as valuable learning opportunities, prompting reflection on how to prevent similar errors in the future and reducing the chance of other students making the same mistakes. A patient safety learning system was used to report and afterward analyze errors that happened. Students were given the chance to give feedback about anything going on directly to the mentors while working. A debrief was held each day after the simulated hospital and during that students were invited to share their feedback, either positive or critical.

Skills monitoring in the study process

According to the Skills Monitoring Concept developed at RSU, the acquisition of skills during the study process is levelled according to 3 learning and teaching strategies. In theory-based learning, skills are acquired at level A, which means student gains theoretical knowledge about the skill, its purpose, and its application. In simulation-based learning skills are acquired at level B in two sublevels – B1 level, where the student learns practical performance of skill in a simulated environment and B2, where the student performs skill in a specific context in a simulated environment, for example using simulation scenario. In the final stage – within the framework of work-based learning, the student performs the skill in a real work environment at C1 and C2 levels. At the C1 level, the student performs the skill in a real work environment under the supervision of a mentor. At the C2 level, the student applies the skill independently in a real work environment under the responsibility of the mentor (Slavinska et al., 2021).

Based on the skills monitoring concept, a skills list for the simulated hospital was created – previously acquired skills at A and B1 levels were integrated into the simulated hospital for B2 level training according to the study course description. Students were

able to learn and practice 11 non-technical skills and 53 technical skills during their 10-day practice.

Aim

The objective of this research is to compare students' self-assessment of skill performance before and after participating in the simulated hospital.

Methodology

The METC has acquired experience in the implementation of 3 simulated hospitals. The first simulated hospital was implemented as a pilot project in January 2022. During this simulated hospital, the students' opinions on clinical practice in a simulated environment and the necessary improvements were evaluated at the end of the pilot project. The second hospital was implemented in April 2022. Within this simulated hospital, a research methodology was developed and tested to obtain students' self-assessment of the level of skill acquisition before and after the hospital.

This study was carried out in the third simulated hospital, which was conducted for two weeks in January 2023 to provide 114 international students in their 3rd year of the study programme "Medicine" with pre-clinical practice in a simulated environment in the fields of internal diseases and surgery. The self-perception of students' benefits was determined using electronic self-assessment questionnaires before and after the simulated hospital. The first questionnaire was filled in on the first day of the simulated hospital during instruction (on-site), and the second one – on the last day of the simulated hospital during debrief (on-site). In total, there were 101 respondents to the questionnaire before the simulated hospital and 66 to the questionnaire after it.

The approach to developing content for the simulated hospital is based on the principle of selecting authentic clinical scenarios. For both the internal medicine and surgical disease profiles, the primary criterion for patient illness selection was that these conditions are frequent in the population. Learners are likely to encounter similar patients in the clinical setting during practical classes, internships, and work.

The criteria for the selection and inclusion of clinical scenarios and skills in the simulated hospital curriculum are frequency of occurrence – prevalence in a real clinical setting and relevance to the list of skills in the study course. In a real clinical setting, patients with similar diagnoses receive different therapies depending on their condition and needs. Therefore, the simulated hospital was also built on a similar principle, where each patient's story corresponds to a specific skill that the students will be able to perform every day.

The distribution-allocation principle for clinical scenarios and skills to be learned/practised is randomisation in the first phase of learning and diversification in the second phase. Thus, providing Intentional persistence skills training. As there were two types of patients – manikins and patients – the available skill set differed accordingly. In the case of manikins, many skills were associated with patient feeding, bedsore prevention,

urinary tract procedures and skills related to patient hygiene. While, in the case of the patient, it was more challenging in the field of communication, patient education. To diversify skills students learned they rotated trough different hospital episodes and each day cared for other patients. It was important to change the patients not only in the field of skill management but as well for communication differences between various types of patients.

Data were collected electronically using Microsoft Office online survey creator Forms, and analyzed using IBM SPSS and Microsoft Office Spreadsheet software The main indicator to measure the changes in self-evaluation was comparing means from both stages (before/after) of the questionnaire.

Limitations

When students are on practical placements, the skills they can perform depend on the patient's situation and the care plans that need to be executed. Additionally, the patient's willingness to let a student practice a particular skill on them also plays a role. A similar approach was used in a simulated hospital where clinical skill availability for managing it was dependent on the patient's case (story). Situations where a patient might not allow a student to carry out the task were excluded. It is common that during a real-life practical placement, some students have the opportunity to practice certain skills more often than others. For example, all students will perform hand disinfection, while some will carry out nasogastric tube placement. Blood drawing will be conducted by most students, whereas urinary catheter placement will involve only a few. The availability of the procedure and, consequently, the opportunity to learn a certain skill varies. Therefore, the development of certain skills might not be observed.

Mentors in the simulated hospital were specifically instructed to use the PEARLS debriefing tool (Eppich & Cheng, 2015) after each day in the simulated hospital to encourage and guide the students in their learning process. The mentors were advised to use a direct answer to the question only as a last resort, with all other decisions and actions left to their discretion based on the situation.

Results

The main indicators in the questionnaire consisted of the list of 64 skills, 11 of which were non-technical skills and 53 technical skills. Students subjectively rated their level of each skill using a scale from 1–5, where 1 – I have not learned such skill so far; 2 – I have only theoretical knowledge of this skill; 3 – I am able to perform the skill under the supervision in a simulated environment; 4 – I am able to perform this skill independently in a simulated environment; 5 – I am able to perform the skill independently in a clinical environment. To measure the increase or decrease of skill self-evaluation, the means of responses for each of the skills before and after the simulated hospital were calculated. The response where students answered, "I did not perform this skill – not learned," was not included in common data and means calculation.

Technical and non-technical skills are separated in two data tables for easier observation of changes in self-assessment, and we would additionally like to make it easy to see that it was possible for students to learn and practice not only technical skills but also non-technical skills and a combination of both types of the skills while taking care of the patients.

Students demonstrated improvement in self-assessment of performance of all 64 skills.

Student responses demonstrate perceived growth for each skill practiced at the simulated hospital. Technical skill growth varies from skill to skill (see Table 1) and there is no clear link between procedure groups or organ systems linked to the procedure and skill growth. For example, the medication administration skill group has various skill growth figures, it is also seen frequently that the higher the skill growth, the lower self-assessment of the skill in questioner before placement.

Table 1 Dynamics of technical skills self-evaluation through simulated hospital learning experiences

Statements measured using scale 1–5	Mean – Before	Mean – After	Growth in levels
Calculation of drug delivery rate using the droplet factor formula	1.47	4.02	2.55
Administration of the medications with the butterfly needle	1.63	4.00	2.37
Vital sign documentation using early warning score	2.08	4.25	2.17
Administration of food through a PEG/gastrostomy	2.26	4.09	1.83
Administration of medication through a PEG/gastrostomy	2.04	3.85	1.81
Care of surgical drain, dressing change	1.94	3.66	1.72
Administration of food through a nasogastric tube-bolus method	2.76	4.34	1.58
Venous system connection to the peripheral venous catheter	2.59	4.17	1.58
Administration of eye drip	2.84	4.42	1.57
Preparation of the venous system	2.85	4.42	1.56
Nasal medication administration	2.51	4.08	1.56
Administering medications using (syringe infusion pump) perfusor	2.74	4.29	1.55
Administration of medication through a nasogastric tube	2.66	4.20	1.54
Patient positioning/bedsore prevention	3.03	4.51	1.48
Administration of ear drip	2.44	3.82	1.38
Administration of food through a nasogastric tube-gravity system method	2.44	3.78	1.35
Body care for a patient with care deficiency – diaper change	2.87	4.20	1.33
Administration of oral medication	3.26	4.58	1.33
Moving the patient in bed from point A to B	3.07	4.38	1.32
Weighing the patient	3.21	4.52	1.32
Administration (withdrawal) of medication from the vial	3.17	4.46	1.29
Disconnection of the venous system from the peripheral venous catheter	3.03	4.26	1.23

Statements measured using scale 1–5	Mean – Before	Mean – After	Growth in levels
Moving the patient – from bed to stretchers and vice versa	3.00	4.20	1.20
Changing bed linen for a patient with a care deficit (bedbound/ unconscious patient)	2.81	4.00	1.19
Primary wound dressing change	2.58	3.75	1.17
Medication administration (withdrawal) from an ampoule	3.35	4.51	1.16
Moving the patient in a wheelchair from point A to B	3.26	4.38	1.13
Assessment of patient vital signs (TA, SpO2, pulse, respiration, etc.) using a monitor	3.53	4.66	1.13
Emptying wound drainage bag	1.88	3.00	1.12
Taking an MRSA smear from the skin	1.83	2.94	1.11
Peripheral venous catheter insertion	3.17	4.26	1.09
Administration of the medications through the peripheral venous catheter with a syringe	3.31	4.40	1.09
Oral care for patients with self-care deficiency	2.84	3.91	1.07
Manual assessment of patient vital signs (TA, pulse, respiration, etc.)	3.58	4.62	1.03
Administration of low molecular weight heparin s/c with a pre-filled syringe	3.04	4.06	1.02
Inhalation administration with a nebuliser	2.49	3.49	1.01
Change of urine collection bag	2.88	3.88	1.00
Venous blood sample collection	3.51	4.48	0.96
Intramuscular injection	3.44	4.38	0.95
Blood culture collection	3.07	3.94	0.87
Emptying urine collection bag	3.21	3.95	0.75
Evaluation of peripheral venous catheter using VIP scale	3.30	4.00	0.70
Injecting insulin s/c with a pre-filled syringe	3.53	4.23	0.70
Post-mortem care of the patient	1.64	2.31	0.66
Nasogastric tube insertion for gastric decompression	2.22	2.88	0.66
Peripheral catheter removal	3.55	4.18	0.63
Sterile glove gloving and doffing	3.98	4.42	0.44
Nasogastric tube insertion	3.01	3.38	0.37
Perineal care for a female	3.32	3.63	0.31
Nasogastric tube removal	3.09	3.40	0.31
Hair care for a patient with a care deficit	2.78	3.05	0.26
Skin suture removal	2.35	2.49	0.15
Perineal care for a male	3.30	3.43	0.13

Table 2 Dynamics of non-technical skills self-evaluation through simulated hospital learning experiences

Statements measured using a scale 1–5	Mean – Before	Mean – After	Growth in levels
Fall risk assessment using the Morse scale	1.61	4.43	2.82
Bedsores risk assessment of the patient using the Braden scale	1.63	4.25	2.61
Telephone communication to address patient care issues	2.31	4.14	1.83
Communication using SBAR (Situation-Background-Assessment-Recommendation) tool	1.83	3.62	1.78
Assessment of patient pain using the VAS (Visual Analogue Scale)	1.80	3.55	1.75
Identification of the unconscious patient	2.78	4.46	1.68
Patient education	2.95	4.52	1.57
Reducing anxiety in the patient	2.83	4.26	1.43
Recognising a situation where a colleague needs help with care for a patient and providing it	3.17	4.49	1.32
Identification of the conscious patient	3.25	4.52	1.28
Introducing yourself	4.09	4.77	0.68

Regarding the non-technical skills (see Table 2) it is notable that students improved their patient identification skills with a conscious patient (difference between before and after results 1.28) and an unconscious one (1.68). They learned how to educate patients (1.57) and reduce anxiety in the patients (1.43). Students learned the use of use various patients' assessment tools such as the visual analogue pain scale (1.75), fall risk assessment-Morse scale (2.81), bedsores risk assessment – Braden scale (2.61) and communication tool SBAR (1.78).

Overall non-technical skills growth was more notable compared to technical skills.

The variance in the rate of skills acquisition could be attributable to multiple factors. In some cases, it might be that specific skills require more training to become mastered, in others the reason might be previous experience with the specific skill. At this point, it is not possible to tell a specific reason why some skill growth was bigger than others.

In addition, in the questionnaire after the simulated hospital students were asked to assess the overall increase in the acquisition and improvement of knowledge and skills in the simulated hospital using a scale: 1 – disagree, 2 – rather disagree, 3 – rather agree, 4 – agree. Students would recommend Placement in Clinical Care in a simulated environment for other students (3.65) (see Table 3). Students responded that they either strengthened or improved existing skills (3.83) and refreshed or improved their existing knowledge in clinical care. All respondents answered that they gained new knowledge (3.77) and skills (3.72). Medical students feel better prepared to work in a real clinical environment after placement (3.70).

Table 3 Students self-evaluated learning benefits from engagement in the simulated hospital

Statements measured using a scale 1–4	Mean
I strengthened/improved the existing skills	3.83
I refreshed/improved my existing knowledge	3.83
I gained new knowledge	3.77
I learned new skills	3.72
I feel better prepared to work in a real clinical environment after placement	3.70
I would recommend Placement in Clinical Care in the simulated environment to other students	3.65

In the third table, the majority of all students responded with "agree", confirming the need to include the simulated hospital as an independent learning opportunity in the study programme. A possible positive contributing factor to the high results could be the fact that the mentors were available to the students and worked only with the students and not with the patients as is the case in a real clinical setting.

Discussion

Students' learning experience in the simulated hospital was positive and growth-oriented. These assumptions are supported by the results showing perceived growth for skills. The students' assessment further supports this that they have not only improved existing knowledge and skills acquired in their study courses and demonstrated in the simulated hospital under conditions close to the work environment. The two-week learning intervention has also resulted in the acquisition of new knowledge and skills, and at a very confident level, which demonstrates the significant impact of the simulated hospital in enhancing the professionalism of future professionals.

For the learning process to be meaningful for the students in the simulated hospital, several prerequisites must be met, which can be divided into two groups: organizational and learning experiences. A great deal of human, time and financial resources must be invested in the organizational preparation of the physical environment of the simulated hospital. From the point of view of meaningful learning experiences, it is also very important to develop high-quality patient scenarios that are appropriate to the students' skills, so that the learning process takes place within the Zone of Proximal Development (Vygotsky, 1978). Mentors also play an important role in challenging students' learning by asking prompting questions that encourage students to do inquiry activities – only in exceptional cases specific answers were given or skills demonstrated. A very specific, constructive and growth-oriented feedback loop is very important here. The third but not least important influence for a meaningful learning experience was the discussion with the students, both before the start of each day in the simulated hospital and after the learning intervention. The debriefing sessions were organized in accordance with the PEARLS debriefing tool (Eppich & Cheng, 2015). During these sessions, the discussion encompassed not only the skills that students succeeded or struggled to demonstrate

but also placed significant emphasis on addressing students' emotional experiences in specific situations. This approach aimed to provide support and boost their confidence in showcasing their skills. Several thematic areas outline the following research directions:

- The impact of developing and implementing a unified approach to enhancing and assessing mentor competencies, within a pedagogical collaboration model, on students' learning experiences and academic-clinical achievement.
- A systematic study of the effects of a consistent multi-level summative and formative assessment system, focusing on providing in-depth feedback loops, planned provision of formative assessment stimuli, and detailed standardized criteria and indicator matrices for summative assessment. Validation of a comprehensive (self) assessment framework that aims to purposefully integrate students, mentors, and patients as assessment actors.
- To systematically organize and evaluate the benefits of student peer learning, with the aim of refining this approach and incorporating it as a core component of a holistic learning programme of a simulated hospital.
- To comprehensively evaluate the simulated hospital from the perspective of time efficiency, assuming that the acquisition of study outcomes within the framework of an intensive simulated hospital could occur on a full-scale basis with less time consumption than in separate study courses, and to draw related conclusions about the necessary restructuring of the study process organization within the study programmes.

To evaluate in which clinical thematic areas it is necessary to integrate the simulated hospital as a regular learning component.

Conclusions

Based on the results of the study, the following conclusions are drawn.

- A simulated hospital is a purposeful way to prepare students for work in a real clinical environment and pre-clinical practice in a simulated environment should be integrated into the study process as an integral part of the educational process;
- The simulated hospital allowed students to practice various skills, including non-technical ones, while emphasizing patient safety and learning from errors;
- In students' perception, their non-technical skills performance improved more than their technical skills during the simulated hospital. The authors of the article suggest that the reason for this is that technical skills are taught at the B1 level in advance, while non-technical skills have not been taught and the simulated hospital is a good place to learn them.
- There is no trustful suggestion why the questionnaire after the simulated hospital was answered by fewer students than the questionnaire before, so the risk should be assessed and responsiveness should be improved in the next simulated hospital, as well as it would be necessary to integrate coding system to link pre and post student responses for more in-depth factor analysis.

- While the skills list of the simulated hospital encompasses the skills acquired during the study process, which are potentially valuable in a real work environment, a challenge arises in providing each student with comprehensive skills training. This challenge is influenced by limitations in time and the number of patients available per student.
- For increased student learning benefits, more emphasis should be placed on efficient immediate feedback to avoid inaccurate pathways, significant errors and dead ends to enhance the quality of healthcare, patient safety and the student's evidence-based confidence in his or her competence.

Author's Note

To access the complete set of analyzed data from the simulated hospital, please contact the authors of the article.

REFERENCES

Eppich, W., & Cheng, A. (2015). Promoting excellence and Reflective Learning in Simulation (PEARLS). *Simulation in Healthcare: Journal of the Society for Simulation in Healthcare, 10*(2), 106–115. https://doi.org/10.1097/sih.0000000000000072

Flin, R., O'Connor, P., & Crichton, M. (2008). *Safety at the Sharp End: A Guide to Non-Technical Skills.*

Hayden, J., Smiley, R., Alexander, M., Kardong-Edgren, S., & Jeffries, P. R. (2014). The NCSBN National Simulation Study: A Longitudinal, Randomized, Controlled Study Replacing Clinical Hours with Simulation in Prelicensure Nursing Education. *Journal of Nursing Regulation, 5*(2), S3–S40. https://doi.org/10.1016/s2155-8256(15)30062-4

Jain, N., Jersovs, K., Safina, T., Pilmane, M., Jansone-Ratinika, N., Grike, I., & Petersons, A. (2023). Medical education in Latvia: An overview of current practices and systems. *Frontiers in Medicine, 10*, 1250138. https://doi.org/10.3389/fmed.2023.1250138

Kantar, Research on the reputation of the field of higher education, 2023.

Kol, E., Ince, S., Işik, R. D., İlaslan, E., & Mamaklı, S. (2021). The effect of using standardized patients in the Simulated Hospital Environment on first-year nursing students psychomotor skills learning. *Nurse Education Today, 107*, 105147. https://doi.org/10.1016/j.nedt.2021.105147

Lioce, L. (Ed.), Lopreiato, J. (Founding Ed.), Downing, D., Chang, T. P., Robertson, J. M., Anderson, M., Diaz, D. A., and 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; September 2020. AHRQ Publication No. 20-0019. https://doi.org/10.23970/simulationv2

Nestel, D. M. (2014). *Simulated Patient Methodology*. Wiley.

Parker, B. A., & Grech, C. (2018). Authentic practice environments to support undergraduate nursing students' readiness for hospital placements. A new model of practice in an on-campus simulated hospital and health service. *Nurse Education in Practice, 33*, 47–54. https://doi.org/10.1016/j.nepr.2018.08.012.

Rudolph, J. W., Raemer, D. B., & Simon, R. I. (2014). Establishing a safe container for learning in simulation. *Simulation in Healthcare: Journal of the Society for Simulation in Healthcare, 9*(6), 339–349. https://doi.org/10.1097/sih.0000000000000047

Slavinska, A., Grigoroviča, E., Palkova, K., Jansone-Ratinika, N., Sīlis, M., Sabeļņikovs, O., & Pētersons, A. (2021). Skills Monitoring in Healthcare Studies – for Patient Safety and Healthcare Quality. In V. Lubkina, G. Strods & O. Vindača (Eds), *SOCIETY. INTEGRATION. EDUCATION Proceedings of the International Scientific Conference,* Vol.1 (pp. 611–630). Rēzekne, Latvia. https://doi.org/10.17770/sie2021vol1.6448.

Healthcare Simulation at a Glance (2019). In Wiley eBooks. https://doi.org/10.1002/9781119604020

Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Massachusetts: Harvard University Press.

Contributor, N. (2022). Exploring the use of pre-briefing and debriefing in educational settings. *Nursing Times*. https://www.nursingtimes.net/roles/nurse-educators/exploring-the-use-of-pre-briefing-and-debriefing-in-educational-settings-21-11-2022/