

Medical Education

DEVELOPMENT OF SIMULATION CENTER AND TRAINING PROGRAMMES IN IVANO-FRANKIVSK PERINATAL CENTER

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Abstract

Current system of medical education in Ukraine needs improvement and reforms in order to enhance the proficiency of doctors and paramedics. Training of practical/technical skills, communication, as well as teamwork skills is considerably important. The use of simulation techniques and methods in medical education is called simulation training in medicine. Medical skills are acquired through cognitive (knowledge) and psychomotor (practice) skills. The first medical simulation centers appeared in Ukraine in 2006 according to the order of the Ministry of Health Care of Ukraine. On June 20, 2013, a new simulation training center was opened in Ivano-Frankivsk on the base of Regional Perinatal Center. Similar medical simulation centers were opened in the second half of 2013 in Volyn and Vinnytsia regions under the Ukrainian-Swiss Mother and Child Health Programme, which started in the area of perinatology. Their goal is to improve the teamwork of all specialists involved in the process of delivery and neonatal intensive care, as well as to engage internship doctors and senior medical students in clinical skills training programmes. The use of simulation techniques and training programs offers a powerful platform to study and practice clinical reasoning behaviors and patterns.

Keywords

simulation training center, clinical reasoning, case-based learning, evidence-based medicine

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Current system of medical education in Ukraine certainly needs improvement and reforms in order to enhance the proficiency of doctors and paramedics. Training of practical/technical skills, communication, as well as teamwork skills is considerably important. It has been reported that simulation training may be of significant importance in achieving this goal.

A simulation is the imitation of the operation of a real-world process or system over time. Whether done by hand or on a computer, simulation involves the generation of an artificial history of a system and the observation of the history to draw inferences concerning the operating characteristics of the real system [1]. The use of simulation techniques and methods in medical education is called simulation training in medicine. Medical skills are acquired through cognitive (knowledge) and psychomotor (practice) skills. Basic clinical and theoretical training of medical professionals includes such skills of non-technical character as communication, clinical reasoning and planning. Constant practice and simulation training are necessary for assimilation and mastering of technical psychomotor and communication skills that allows to practice these skills until they become automatic. Simulation techniques allow reducing the scope and volume of patient exposure. Increasing demands to reduce patient risk associated with the traditional mentored development of clinical and technical proficiencies are mounting, as is public demand

for increasing objectivity and transparency of competence before trainees practice on their own. Thus, development of simulation centers is of great importance nowadays.

The first medical simulation centers appeared in Ukraine in 2006 according to the order of the Ministry of Health Care of Ukraine. They mostly focused on the development of basic life-support skills and were aimed to improve first-aid treatment all over the country. On May 30, 2013, the first Ukrainian simulation center was officially opened in the Crimean Perinatal Center, Simferopol city. On June 20, 2013, a new simulation training center was opened in Ivano-Frankivsk on the base of Regional Perinatal Center. Similar medical simulation centers were opened in the second half of 2013 in Volyn and Vinnytsia regions. These medical simulation training centers were opened under the Ukrainian-Swiss Mother and Child Health Programme, which started in the area of perinatology. All the centers acquired high-tech simulators SimMom and SimNewB manufactured by Norwegian company Laerdal. It must be said, that it all became possible due to a long-standing successful Ukrainian-Swiss partnership. The goal of this new training center is to improve the teamwork of all specialists involved in the process of delivery and neonatal intensive care, as well as to engage internship doctors and senior medical students in clinical skills training programmes. Simulation techniques, by no means, are

important for the development of clinical reasoning. This competency is acquired through didactic coursework followed by an apprenticeship phase where learners are mentored by experienced clinicians [2]. Case-based learning (CBL) is often used to teach clinical reasoning. The use of simulation techniques allows enhancing case-based learning in both physician assistants and medical school curricula. It makes it possible to prepare students and internship doctors for clinical training, linking theory to practice. Mannequin-based cases are used to mirror realistic encounters, reliably assess learner performance, and provide highly specific individualized feedback.

The use of such simulation programmes makes it possible to:

- engage and assess individual learner's clinical reasoning in a case-based learning course;
- promote collaborative learning in small groups within the medical curriculum;
- improve interactive learning in larger groups;
- study diagnostic reasoning behavior, cognitive bias, and diagnostic error.

Successful academic program, course or module begins with clear understanding of the results achieved after its completion. Thus, it is necessary to define the goals and tasks of the program. For this reason Bloom's Taxonomy may be used. It was created in 1956 under the leadership of educational psychologist Dr Benjamin Bloom in order to promote higher forms of thinking in education, such as analyzing and evaluating concepts, processes, procedures, and principles, rather than just remembering facts (rote learning) [3]. It is most often used when designing educational, training, and learning processes. It identifies three domains of educational activities or learning

- Cognitive: mental skills (knowledge)
- Affective: growth in feelings or emotional areas (attitude or self)
- Psychomotor: manual or physical skills (skills).

The aim of this classification is to encourage teachers and instructors to take into account all the three aspects while developing the educational program and assuring more cohesive approach to training. It is of fundamental importance for organizing the educational process in simulation centers.

Simulation center on the base of Ivano-Frankivsk perinatal center has developed object-oriented educational program focusing on certain clinical case scenarios that are the most common for our region and are associated with high risk of neonatal morbidity and mortality. The program includes scenarios worked out under the "Mother and Child Health Program" (Table).

These clinical case scenarios were developed taking into account the references of national and local protocols as well

as international recommendations on the management of certain health conditions based on the principles of evidence-based medicine. At the same time, the scenario presupposes not only the accomplishment of some particular actions and development of technical skills, but also team work of health professionals from various fields of medicine (interdisciplinary cooperation).

The educational program is usually divided into some simulation modules that include such four parts:

- Introduction: elicitation, instructions (briefing), setting objectives.
- Accomplishment of the case scenario.
- Debriefing (may include short theory review).
- Summarized accomplishment of the case scenario, final testing, and evaluation.

This strategy is based on recommendations stated by the Best Evidence Medical Education (BEME) Collaboration (Issenberg, 2005) and involves the following key aspects of simulation training:

- provides feedback at the conclusion of training;
- possibility of multiple skills training;
- integration with educational program of training;
- possibility to choose the level of difficulty;
- adaptation to the needs of trainees;
- variety of clinical case scenarios;
- safe training environment for both patients and doctors/nurses/interns/students: possibility to make mistakes without real harm to the patient;
- individual training approach;
- defined study goals and tasks;
- the use of adequate level technologies.

Evaluation of simulation center activity is of great importance for its further successful work. The evaluation system should be based on both quantitative and qualitative criteria. Quantitative criteria involve the number of training sessions and number of trained participants (students, interns, doctors). Qualitative criteria are based on meeting the requirements of professional standards, records of evidence-based medicine, and, finally the opinions of the leading experts in specific field of medicine, and positive references of the participants. Activity and effective work of simulation center involves two inter-related aspects: pedagogical and social. They both are assessed according to the acquired knowledge, clinical actions, interpersonal dynamics (behavior). It is necessary to

Table 1. Examples of clinical case scenarios

Obstetrics	Neonatology
Cardiopulmonary resuscitation	Primary neonatal resuscitation:
Fetal distress syndrome	Initial resuscitation (clear amniotic fluid)
Postpartum hemorrhage	Initial resuscitation (meconium-stained amniotic fluid)
Preeclampsia and eclampsia	Complete resuscitation (clear amniotic fluid)
Shoulder dystocia	Premature newborn resuscitation
Pulmonary artery thromboembolia	Assistance of newborns with respiratory distress syndrome:
	Moderate respiratory distress
	Severe respiratory distress

monitor the quality of education and further improve the technical aspects of training programs on the basis of introduction of modern experience and the best practices in the field of medical simulation training.

Thus, the use of simulation techniques and training programs offers a powerful platform to study and practice clinical reasoning behaviors and patterns, as well as to improve the teamwork of all specialists in the process of delivery and intensive care of newborns. Medical simulation training is becoming an accepted method for medical education in Ukraine giving the possibility to improve technical skills of both qualified doctors and students.

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