

SIMULATION TRAINING IS A FACTOR IN DEVELOPING CLINICAL SKILLS FOR MEDICAL STUDENTS

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Relevance: During the period of modern challenges related to the new coronavirus infection, the education system is faced with the difficult problem of organizing the educational process. The distance learning system for universities is not know-how, however, in the current conditions, all educational organizations, switching to a remote mode of operation, are faced with the choice of optimal methods of teaching, especially clinical disciplines. In this case, we see simulation training as the most optimal option. In addition, recently this type of training has become an option for preparing for specialist accreditation. The created accreditation and simulation center allows you to perform the functions of training and control without involving patients. We consider simulation training as practical training for medical students. This training brings the imitation of activity during simulation closer to reality with a high degree of reliability. This is achieved through strict implementation of the algorithm of joint activity between the teacher and the student: mastering skills, developing automatically repeating actions, mastering the competence of promptly making an adequate decision, forming, consolidating and monitoring knowledge. Work with phantoms in a medical university has been carried out for more than 10 years, but the work of modern complex virtual simulators provides for a new material and technical base, which led to the creation of a modern accreditation and simulation center. The simulation center has become a structural unit of the university, licensed for educational activities in the field of healthcare, which is a mandatory licensing requirement for educational organizations.

As many practitioners and employers have noted, inadequate clinical skills training is a major problem in modern medical education. Many procedures are potentially dangerous due to their invasive nature, making them difficult to teach and learn. In addition to reducing risk to patients, simulation is valued for its ability to create environments that optimize learning. Complex elements of a medical procedure can be selectively repeated, and learners develop competence through deliberate and repeated practice, facilitated by timely feedback and appropriate reflection.

All medical educational organizations have structural units, such as accreditation and simulation centers. Since 2014, such centers began to appear in all medical universities in the country; their activities were not described by state requirements and standards [5]. Now changes have occurred not only in the structure of such centers, but also in the requirements for their organization, which have become regulated.

Considering the role of simulation training in the training of a pediatrician, turning to the standards, we understand that "... a graduate who has mastered the specialty program must have professional competencies corresponding to the types of professional activities that the specialty program is

focused on” [6]. The professional activity of a graduate of the pediatric faculty includes 16 professional competencies, which must not only be developed, but also tested at the simulation center. A pediatrician who has been certified and can work in his specialty is often faced with situations of providing emergency medical care to children with conditions that require urgent medical intervention.

A student studying at a university masters this competency, and he must know the etiology, pathogenesis, clinical picture, features of the course and possible complications of the disease, and understand all the consequences of the therapy. When forming competencies, we differentiate them into knowledge, skills, and possessions. And only checking them together can determine the maturity of competencies.

According to our preliminary survey of fifth-year students of the Faculty of Medicine at ASMI (155 students), students note insufficient preparedness for practical activities (47%). In our opinion, the use of simulation training will help to more effectively develop the professional competencies of graduate students.

For students to successfully master competencies, we propose the use of simulation training technology, where “..simulation training is an interactive type of activity through immersion in the environment by recreating a real clinical situation. Simulation learning is an active process during which the student connects theoretical knowledge and practical skills” [3].

Purpose of the study: to determine the effectiveness of completing a training task with a simulator during simulation training using a briefing.

Material and research methods: Our study involved 25 sixth-year students of the medical faculty of the Andijan State Medical Institute, who were divided into two groups. In the first group (experimental), the teacher explained the causes of hypoglycemic coma, the gradual development of the disease, diagnostic criteria and indicators that provoke deterioration of the condition. In the second group (control) this explanation was not given.



Theoretical research methods: Psychological, pedagogical and medical literature was analyzed, which described methods for implementing simulation training.

Practical research methods: a preliminary survey was conducted of all sixth-year students (155) of the Faculty of Medicine in order to identify educational needs, a survey of a group of students (25)

was conducted and the effectiveness of simulation training was revealed, the results of testing on actions in a clinical situation based on the results of the classes were analyzed.

Research results and discussion: Let us consider the technology of simulation training for developing skills in providing emergency care for a patient with hypoglycemic coma in an outpatient setting.

The training process takes place on the basis of the multidisciplinary accreditation and simulation center of ASMI and includes several main stages. Stage 1: determining the level of preparedness of students by testing. Next, the teacher conducts a briefing (or instruction), explaining the causes of hypoglycemic coma, describes step by step the development of the disease, diagnostic criteria and conditions for the development of deterioration of the condition, determines the purpose of the student's lesson (working out an algorithm for providing emergency care to a child with a hypoglycemic coma) and provides instructions on the operation of the simulation equipment and safety precautions. Stage 2: completing a training task individually or as a team training in a simulated environment that is as close as possible to the proposed situation in order to immerse students in conditions that are closest to real life.

All students were offered a clinical situation of providing emergency care in an outpatient setting to a patient with a hypoglycemic coma. Let's consider the data presented by the students: a 45-year-old patient came for an outpatient appointment with a local doctor. From the anamnesis it is known that after active physical activity weakness, hand tremors, increased heart rate and abdominal pain appeared. According to the examination and physical data, it was found that the skin was moist, muscle tone, and tendon reflexes were increased. Blood pressure – 145/100 mmHg. Art., heart rate (HR) – 142 per minute, respiratory rate (RR) – 30 per minute. On auscultation: clear, rhythmic tones, no noise, vesicular breathing over the lungs, carried out in all parts of the lungs, no wheezing. The abdomen is soft and painless on palpation, there are no symptoms of peritoneal irritation. Urination is not impaired.

The situation described above assumes that only the doctor and the patient are present in the office; 10 minutes are allotted to conduct an examination, perform an examination, make a diagnosis and prescribe treatment. The algorithm for practicing practical skills includes 2 main areas: 1) making a diagnosis; 2) prescribing treatment and monitoring its effectiveness.



The implementation of the scenario begins with an assessment of the situation in the office. Having made sure that there is no danger, the student begins to examine the patient (phantom) and makes a diagnosis. Examination of the patient includes assessing the presence of consciousness by clenching

the palm and speaking loudly to the patient (phantom). The student assesses the patency of the airways by examining the oral cavity, uses a pulse oximeter to measure blood saturation, performs auscultation and percussion of the lungs, measures the respiratory rate (RR), assesses the amplitude of chest excursions, and provides oxygen therapy as indicated. To carry out this manipulation, the student uses a breathing mask with a reservoir, connects it to an oxygen source, choosing the right oxygen flow. Next, he moves on to assessing the activity of the cardiovascular system (the student measures peripheral pulse and blood pressure using a cuff and a phonendoscope, listens to heart sounds at the main points of auscultation, connects an electrocardiograph, correctly applies electrodes and interprets the results of electrocardiography, palpates the lower border of the liver, examines the veins of the neck, evaluates the white spot symptom and skin color).

Assessment of neurological status: the student determines the photoreaction of the pupils using a flashlight and the palm of his hand, uses a glucometer to measure blood glucose and correctly interprets its result, assesses muscle tone by flexing and extending the limbs. Additionally, he palpates the abdomen to exclude acute surgical pathology and measures body temperature.

While performing the above actions, the student speaks out loud all the actions performed, and the teacher voices the results of the examination and examination data, which the student must analyze and formulate a preliminary diagnosis. After making a diagnosis, the student begins to provide emergency assistance, announces the name of the drug, route of administration, and independently calculates the required amount and sequence of drug administration. Next, the student monitors the effectiveness of the treatment by assessing the functions of vital organs.

The execution of the script sequence is videotaped for immediate feedback to participants during debriefing.

Stage 3: debriefing (analysis, analysis of the experience gained by participants during the simulation scenario) is an important component of simulation training. The teacher, together with the student, discusses all options for the presented scenario, helping him to realize his mistakes on his own. To initiate a discussion and ensure that all learning objectives have been covered, they together watch a video recording of a learning task and analyze errors in the application of both theoretical knowledge and practical skills. At the end of the debriefing, students share how they would act if they had the opportunity to go through this situation again.

Stage 4: final completion of the task. The same scenario with one group must be repeated 3-4 times in order to achieve perfect execution of the task. At the same time, viewing the video and a full debriefing should be carried out after each simulation. At the end of the lesson, a final test is carried out using the questions from the 1st stage tests. We analyzed the effectiveness of the second stage of simulation training according to the following criteria and indicators (table).

1. Examination of the patient: the completeness, accuracy and consistency of the examination of the vital systems of the body were assessed.
2. The correctness and completeness of the diagnosis were assessed in accordance with the examination data.
3. Purpose of treatment: correct choice of drug, dose, route and sequence of drug administration.

Table No. 1. Analysis of the effectiveness of the second stage of simulation training

Criteria	Indicators	Group 1 (n=12)	experimental group 2 (n=13)
Control Patient	Correct and complete assessment of systems	8 (67%)	5 (38,4%)
	Inspection sequence	8 (67%)	4 (30,7%)
Making a diagnosis	Correct and complete diagnosis	7 (58%)	4 (30,7%)

Purpose of treatment	The correct drug was chosen	9 (75%)	4 (30,7%)
	The dose of the drug was calculated correctly	9 (75%)	4 (30,7%)
	Correct route of administration	9 (75%)	4 (30,7%)
	The sequence of drug administration is correctly indicated	9 (75%)	4 (30,7%)

When analyzing the results of the control test, we can conclude that the experimental group performed the task 30% better than the control group. Thus, when examining a patient in the experimental group, 67% of students did not make mistakes and carried out the entire examination according to the proposed scheme, while in the control group only 38.4% of students achieved their goal and carried out the examination without comments. By considering the results according to the presented criteria, one can assess the level of effectiveness of the briefing in simulation training.

Observation of students showed that during the 2nd stage, students in the control group were hesitant in examining and assessing the condition of vital systems, did not follow the sequence, and 70% of students made mistakes when making a diagnosis. It was noted that students in the control group, when providing emergency care, spent significantly more time performing manipulations compared to students in the experimental group. The results of the final test also showed a low percentage of correct answers for the control group of students.

Conclusion: Thus, the analysis of the work performed showed the need to complete all stages of simulation training. Through scenario-based simulation training, students can learn important skills such as interpersonal communication, teamwork, leadership, decision making, and the ability to prioritize in stressful situations. However, simulation training should be viewed as an adjunct to, and not a replacement for, training with real patients.

LITERATURE:

1. Габа Д. М., Фиш К. Дж., Хауард С. К. Критические ситуации в анестезиологии / пер. с англ. – М.: Медицина, 2000. – 440 с.: ил.
2. Евдокимов Е. А., Пасечник И. Н. Оптимизация образования в области неотложной медицины: роль симуляционных технологий // Медицинский алфавит. Неотложная медицина. – 2013. – № 3 (17). – С. 8–13.
3. Прасмыцкий О. Т., Кострова Е. М. Симуляционные технологии обучения студентов в медицинском университете по ведению пациентов в критических ситуациях // Медицинский журнал. – 2015. – № 2. – С. 34–41.
4. Симуляционное обучение по анестезиологии и реаниматологии / сост. М. Д. Горшков; ред. В. В. Мороз, Е. А. Евдокимов. – М.: ГЭОТАР-Медиа: РОСМЕД, 2014. – 312 с.
5. Ялонецкий И. З., Грачев С. С., Прасмыцкий О. Т. Особенности современного симуляционного обучения анестезиологии и реаниматологии // Молодой ученый. – 2017. – № 24 (158). – С. 80–82.
6. Barsuk J. H., Cohen E. R., Feinglass J. Use of simulation-based education to reduce catheter-related bloodstream infections // Arch. Intern. Medicine. – 2009. – Vol. 169. – P. 1420–1423.
7. Burden A. R., Torjman M. C., Dy G. E. et al. Prevention of central venous catheter-related blood stream infections is it time to add simulation training to the prevention bundle? // J. Clin. Anesthesia. – 2012. – Vol. 24, № 7. – P. 555–560.

8. Cooper J. B., Taqueti V. R. A brief history of the development of mannequin simulators for clinical education and training // *Postgraduate Medical J.* – 2008. – Vol. 84. – P. 563–570.
9. Gaba D. M. Dynamic decision-making in anesthesiology: cognitive models and training approaches, p. 122. In: Evans D. A., Patel V. L. (eds): *Advanced Models of Cognition for Medical Training and Practice.* SpringerVerlag, Berlin, 1992.
10. Holcomb J. B. et al. Evaluation of trauma team performance using an advanced human patient simulator for resuscitation training // *J. Trauma.* – 2002. – Vol. 52. – № 6. – P. 1078–1086.
11. Howard S. K., Gaba D. M., Fish K. J. et al. Anesthesia crisis resource management training: teaching anesthesiologists to handle critical incidents // *Aviat. Space Environ. Med.* – 1992. – Vol. 63. – P. 763.
12. Ma I. W. Y. et al. Use of simulation-based education to improve outcomes of central venous catheterization: a systematic review and meta-analysis // *Acad. Medicine. J. Association of American Medical Colleges.* – 2011. – Vol. 86, № 9. – P. 1137–1147.
13. Mah J. W. et al. Mannequin simulation identifies common surgical intensive care unit teamwork errors long after introduction of sepsis guidelines // *Simul. Healthc. J. Soc. Simul. Healthc.* – 2009. – Vol. 4, № 4. – P. 193–199.
14. Makary M. A., Daniel M. Medical error – the third leading cause of death in the US // *BMJ.* – 2016. – Vol. 353. – P. i2139.
15. McGaghie W. C., Issenberg S. B., Cohen E. R. et al. Does simulation-based medical education with deliberate practice yield better results than traditional clinical education? A meta-analytic comparative review of the evidence // *Acad. Med.* – 2011. – Vol. 86, № 7. – P. 706–711.
16. Morgan P. J. et al. Efficacy of high-fidelity simulation debriefing on the performance of practicing anaesthetists in simulated scenarios // *Br. J. Anaesth.* – 2009. – Vol. 103, № 4. – P. 531–537.
17. Rodgers D. L., Securro S. J., Pauley R. D. The effect of high-fidelity simulation on educational outcomes in an advanced cardiovascular life support course // *Simul. Healthcare.* – 2009. – Vol. 4. – P. 200–206.