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**PEDAGOGY**

# FUTURE DEVELOPMENT OF SIMULATION METHODS OF TRAINING STUDENTS OF DENTAL FACULTY

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**ABSTRACT**
Modern educational process provides high activity and independence of students, and thus the higher demands of teaching, including new technologies. Simulation training methods and training on phantoms has great importance in education of students in dental higher education. Simulation training allows students to learn practical skills at a high level, ensuring patient safety and reduce the number of medical errors in their future practice. Development of new methods for improved stimulation of learning and their implementation in the educational process in dental departments is an actual task for high school teachers.



Formation of professional competence in students is a complex process, which includes a lot of components. The purpose of high education is to train highly educated and competitive specialists on the basis of their knowledge, skills, and intensification of intellectual, moral, creative and physical development of the individual. Application of imitation technologies is intended to increase the efficiency of the educational process, the level of professional skills and practical skills of medical workers, providing them with the most effective and safe transition to medical activity in real conditions. With the help of simulation techniques, it is possible to develop practical skills of students, which will allow them to confidently move on to genuine interventions. This provides continuous professional training of medical personnel in accordance with the modern algorithms. During the training, not only clinical skills are developed, but also the ability to communicate with colleagues and patients. To do this, special simulators and game teaching techniques are developed that allow you to simulate different clinical situations, including those that are rarely encountered.

Dentist becomes more experienced year after year, assuming the minimum number of fatal errors. But for this he should get into the dentist's office already with the acquired basic motor skills. The only effective and safe way to work out the initial practical skills in our time is the use of virtual simulators. Doctors who master practical skills with the help of a simulator, much faster and more confidently will go to these interventions, their further real results'll become more professional.

Patient safety is a critical component of quality of medical care. However, only in the USA, according to recent estimates, the annual medical errors leading to the death of over 200,000 people and causing serious injuries in 10-20 times more patients [1]. For comparison: 30-35 thousands of Americans die in car accidents every year. Thus, the chance of dying from improper actions of a doctor is much greater than the risk of driver error on the road.

Reducing the number of medical errors contribute to various factors. Among them - new approaches to medical education that allow medical personnel to learn and practice on the mistakes of others and on their own, without risking life and health of patients. This is the goal of simulation

study. Therefore, the actual task of higher medical education is to develop a modern, more efficient methods of preparing future professionals and the introduction objective methods of checking the quality of knowledge and development of practical skills in students. [2]

Today the educational process provides high activity and independence of students, and thus the higher demands of teaching, including new technologies. According to a large number of authors experience of using phantoms and simulators showed increased interest of students learning and quality of learning [3, 4, 5]. Clinical simulation helps in real time create practical skill of the doctor without consequences for the patient. In connection with this the organization of phantom and simulation training of students is necessary direction in the educational process.

The goal of our work - to explore the relationship between simulation teaching methods and the formation of individual skills in students.

Simulation training methods began to develop very long time ago. Even in the second half of the XVIII century the outstanding French obstetrician Angélique du Coudray, developed obstetric simulators life size, known as "Madame du machine Coudray" [6]. They were made of cloth and leather stuffed with real human bones and a system of belts and wooden struts which form the simulated torso and elasticity of the birth canal and perineum.

The modern history of simulation training in medicine started only in the 60s of last century. At the famous mannequin Resusci Anne, constructed by manufacturer of plastic toys Norwegian Asmund Laerdal, millions of people have learned how to do cardiopulmonary reanimation. Began production of simulators designed for training anesthesiologists, cardiologists and other doctors.

Later, thanks to the development of computer technology and microelectronics, were created high-tech dummies that allow you to unleash the true potential of simulation training. Finally, in 1994, was created SESAM - European Association of simulation in medicine, which annually holds a major international conference. [7]

There may be a misconception that medical simulation training - is working out at the phantoms certain treatments and procedures. This is really a very important part of the learning process, but by no means the only one.

The quality of dental care depends not only on theoretical knowledge but also of practical skills of dentist.

The Department of Prosthetic Dentistry trains students from 2nd to 5th year. During this time, students learn a large amount of material, but only theoretical knowledge is not enough. Orthopedic patients need a doctor, not only excellent theoretical knowledge and clinical thinking but also knowledge of material science and construction of dentures. So feature of this discipline is teaching the large number of practical skills, both clinical and laboratory (technical) which must be practically trained for better perception of the material. The course Propaedeutic of prosthetic dentistry should pass on phantoms. Students must explore new materials used in prosthetic dentistry. Should practice preparation skills of all groups of teeth for making various orthopedic designs, prints different impression materials, plaster casting jaw models, simulation of coronal tooth with wax.

Later, students learn clinical and laboratory stages of manufacturing orthopedic constructions, have the ability to produce prefabricated prosthesis in dental laboratory conditions that will allow them to further more effectively collaborate with dental technicians at work in the clinic.

It should be noted that the student must not only have knowledge of the health of the teeth-jaw system and conduct patient diagnosis, but also have knowledge of each design and material associated with them. Therefore, the treatment plan is in prosthetic dentistry is the term "differential prosthesis design choice", where each class of treatment can offer patients several options for designs, analyzing all the "pros" and "cons". Therefore, it is impossible to complete acceptance and understanding of prosthodontics without fixing theoretical material on phantoms.

Unfortunately, with supporting materials and phantoms jaws we cannot fully reproduce the clinical conditions of podiatrist. Maximum proximity to the real conditions of absolute safety of medical care for the patient is required. It is possible to reproduce with special trainer-simulators as job dentist, having a working unit that simulates the dental unit and allows you to connect head of model for practicing clinical skills, including preparation of teeth and so on. These trainers and simulators are usually computer equipment and recording capability that allows conducting work on the mistakes and repetition of clinical stages to the formation of skills. It should be noted that in this study, students have the opportunity not only to fulfill the skills and correct mistakes, but also to analyze the situation and draw conclusions.

The biggest challenge in teaching clinical courses is the lack of a clinic providing individual students thematic patients. So trainers and simulators allow you to plan the learning process regardless of the patients in class.

Simulation training in prosthetic dentistry is an important step in the understanding of certain procedures. Orthopedic dentists should be able to recognize critical situations that require immediate intervention:

– they understand the limits of their skills and time to call for help of specialists needed in this situation: anesthesiologists, laboratory assistant etc.

– the procedure for calling for help must be fulfilled: we must know which is the room of certain specialist and give him information in summary form on arrival in time, is ready for action in a particular critical situation, with all the necessary equipment;

– you need to work out procedures and communication skills in a team. Dentists are not always aware that cut expressions, which they routinely used in a familiar environment, can be confusing for new team members. Therefore, it is necessary to work on wording of the instructions and on feedback that confirms their correct understanding and acceptance for execution;

– important roles are behavior and team leader, and a leader transfer from one to another team member, depending on the main tasks on which team is now working. It often happens that a problem is not enough manpower, while other team members who could help are not involved;

– the stress significantly increases the number of errors that make health workers, even those procedures that they had practiced in a calm situation at the gym. Therefore, simulating the real environment and critical situations, you need to teach students to act properly and in a state of extreme nervous tension.

Apparently, simulation training must solve a much wider range of tasks than just working on special simulators psychomotor skills to perform certain manipulations and procedures. Equally important is the development of so-called non-technical skills - the ability to make decisions, leadership and organizational skills, communication skills and command support and so on. [8].

If there is such a comprehensive approach proper manufacturability of dummy (level of computerization, feature set, etc.) is not a determining factor in the success of simulation training. More important role of coaching competence team worked out the methodology and structure of the training session.

Thus, the combination of phantom and simulation study will give us more positive results in the training of future dentists, orthopedists, forming clinical thinking and improving of individual skills, which certainly affect the quality and lead to fewer mistakes in the future.

The issue of simulation training is also of interest to first-year faculty. So the study of students at the department of human anatomy is constantly associated with the use of natural anatomical cadavers. Providing the same educational process with anatomical cadavers has some difficulties (insufficient funding, the presence of a special room and the appropriate staff, etc.), in addition, it is associated for some students with unpleasant emotional experiences and physical sensations (nausea, irritation of the conjunctiva). These complexities and the small availability of anatomical cadavers make use of alternative methods of their manufacture. So, for example, anatomical preparations of a brain are at the department of anatomy of a person especially in small quantity for several reasons. Firstly, because of the complexity of the preparation of the preparations , and secondly, because of the problem of its preservation, since using the formalin or alcohol fixing solutions the brain loses its elasticity and becomes more fragile. The lack of natural anatomical preparations (especially the nervous system structures) on the morphological departments of higher medical education institutions, as well as the principles of bioethics, require the use of simulation teaching methods, 3D technology simulation of anatomical objects in the educational process. Further popularization of these technologies is needed to improve the educational process in medical educational institutions.

Teachers of medical schools should use three-dimensional graphics in simulation teaching methods to demonstrate anatomical preparations. The obtained data can be used in the educational process of the morphological departments. They complement existing perceptions of the general laws of the structure of the central nervous system. All this allows you to create bright, interesting lessons that are most memorable. However, despite of the possibility of using computer simulation systems to study anatomy of a person, it is unlikely that there will be an opportunity to abandon usage the preparations of human bodies [9].

Thus, the introduction of the simulation method of training is a new direction in the modern native school of training highly skilled competitive personnel, the formation of a medical professional

as a professional and integral person. But simulation techniques cannot be the main and only ones in the study of morphological disciplines, since the best anatomical textbook or atlas for a student is the natural biological material.

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