ACADEMICIA
An International Multidisciplinary Research Journal
(Double Blind Refereed & Peer Reviewed Journal)

DOI: 10.5958/2249-7137.2021.01764.X

SIMULATION TECHNOLOGIES: DEVELOPMENT OF CLINICAL THINKING WITH THE HELP OF A VIRTUAL PATIENT

Gadaev Abdigaffar Gadaevich*; Abduraximova Lola Anvarovna**

[1,2]Tashkent Medical Academy,
Tashkent, UZBEKISTAN

ABSTRACT

The study examined the level of clinical thinking and perception of students when learning on Body Interact. A questionnaire was used for students in the direction of "general medicine", after the completion of the cycle and analysis of clinical scenarios. The results showed that more than 80% of students noted a positive impact on the development of clinical skills and contributes to the development of clinical thinking. Training Center according to the schedule of practical classes in the 2019-2020 academic year, took part in the survey. All students who completed a practical lesson with the use of a virtual patient were asked to complete an online questionnaire. Modern medical education offers a wide range of simulation technologies for the development of clinical skills, while virtual interactive systems are an innovative solution with limited opportunities for working with real patients.

KEYWORDS: *Simulation Training, Virtual Patient, Clinical Thinking, Questionnaire.*

INTRODUCTION

In the modern world, in the era of rapid development of high-tech medicine, society makes increased demands on the quality of medical services. This indicator and the quality of life of patients after treatment should underlie the assessment of the professional activities of individual specialists and medical institutions, as well as the level of health care in general. Therefore, the key task of modern medical education is to create conditions for the development of a wide range of competencies and firmly established practical skills in students without the risk of harming the patient [2,3].

One of the methods of improving the quality of practical training of future paramedics, nurses, midwives, medical laboratory technicians is the use of simulation technologies. Simulation in

medical education is a modern technology for teaching and assessing practical skills, abilities, and knowledge based on realistic modeling, imitation of a clinical situation, or a separate physiological system, for which biological, mechanical, electronic, and virtual (computer) models can be used [1.4].

The training of future doctors cannot be reduced only to the repetitive performance of a series of manipulations and procedures. A future doctor should not only learn to apply the acquired knowledge and skills but be able to do it in a systemic, complex manner, demonstrating the so-called “clinical thinking” [5,6]. Body Interact is an interactive virtual system designed to practice diagnosis, make clinical decisions and develop clinical thinking using the "virtual patient" technology.

Modern medical education offers a wide range of simulation technologies for the development of clinical skills, while virtual interactive systems are an innovative solution with limited opportunities for working with real patients [3]. Such an innovative platform is the virtual interactive system Body Interact, designed for diagnosis, clinical decision making, and emergency care.

According to the literature, such innovative technologies contribute to the effective training of medical students, improve the quality of training of future healthcare professionals, and the willingness to apply their knowledge in clinical practice.

At the Tashkent Medical Academy, Body Interact has been used in the educational process since 2019. It became necessary to assess the level of students' perception of clinical situations and their impact on the clinical thinking of students.

Purpose of the study. The aim of this study is to study the level of understanding - the perception of students during learning with the help of a virtual patient and to assess the influence of the syndromic approach on the development of clinical thinking.

Materials and methods. The virtual patient Body Interact is a horizontal touch-screen table, which depicts a virtual patient and displays the data of physiological parameters, electrocardiography, X-ray images, and the results of prescribed laboratory tests requested during diagnostics. The virtual simulator in real time displays the change in the patient's condition, as well as all the manipulations performed by the cadet, the patient's response to the treatment. At the end of the training session, an objective assessment of the cadet's actions according to the specified criteria is displayed on the screen. In particular, the expediency of the appointments made is indicated.

The clinical scenarios included in the kit are designed with varying degrees of complexity in mind. There are scenarios for various clinical specialties, including cardiology, endocrinology, neurology, traumatology. The instructor has access to all scenarios, while the student only has access to those scenarios that have been selected for him by the instructor. The virtual simulator has the following features:

• Clinical experience from a rational history, examination, diagnosis to management and treatment tactics;

• A variety of virtual patients, a choice from a variety of states of patient states;

• Dynamic communication with the patient, dialogue - collecting anamnesis, questioning on the main and concomitant complaints, the development of the disease and life history;

• Objective picture, the possibility of a visual examination of the patient (the monitor displays physiological parameters, important indicators, manifestations of pain, consciousness or loss of consciousness, pallor, cyanosis, acrocyanosis, yellowness, various rashes, chest movements, etc.)

• Algorithm of actions - the choice of groups of drugs, the choice of doses, drugs, medical interventions, and manipulations;

• Monitoring of vital parameters in real-time: blood pressure, heart rate, RR, SpO2;

• Physiological examination: palpation, percussion, listening to heart and lung sounds, measuring body temperature, pupil response, and other data;

• Reference images at the request of the student: electrocardiogram, angiography, bone x-ray, computed tomography, organ x-ray, ultrasound of the abdominal organs, ultrasound of the carotid arteries with Doppler, chest x-ray, colonoscopy, coronary angiography, head computed tomography, spine x-ray, ultrasound ... examination of the lower extremities, computed tomography of the pelvis, echocardiography, transthoracic echocardiography, endoscopy of the upper gastrointestinal tract;

• Laboratory tests: CBC, arterial blood gases, biochemistry, blood test for infections, blood glucose levels, heart markers, coagulation test, blood test for fats, general urine test, urinalysis for antigens, etc.

• Interventions: catheterization, defibrillation, chest compression, oxygen therapy, blood transfusion;

• Categories of drugs, methods of administration and dosage: analgesics, anti-inflammatory, antiarrhythmic, antibiotics, antiplatelet agents, antipyretics, bronchodilators, coagulants, diuretics, fibrinolysis inhibitors and ions, gastrointestinal, gastrointestinal, sedative, vasoactive substances;

• Debriefing: journal - an algorithm of actions, analysis, and evaluation of the student's work done.

The learning algorithm is built according to the following algorithm:

• Objective picture, examination, patient status

• Assessment of physiological parameters

• Interview with a patient

• Application of the ABCDE method (task priority)

• Appointment of laboratory tests and interpretation of their results

• Differential diagnosis of the condition.

• Development of a treatment strategy, prescription of pharmacological drugs.

• Choice of treatment method based on clinical risks.

• Determination of the prognosis of the course of diseases.

• Follow-up: re-interview, re-assessment of the patient's condition, transfer of the patient to other hospital departments, data recording

• End of the study session, objective assessment of the student's actions.

To assess the perception of students, a questionnaire was used to assess the mastery of the clinical decision skill after using the interactive system. Students of the 5th and 6th courses in the direction of "General Medicine" of the Tashkent Medical Academy, who were trained in the Simulation Training Center according to the schedule of practical classes in the 2019-2020 academic year, took part in the survey. All students who completed a practical lesson with the use of a virtual patient were asked to complete an online questionnaire. Body interaction - horizontal touch screen table, available in 40 clinical scenarios, adapted in Russian with various pathologies in internal medicine.

Results. 204 students of the specialty "General Medicine", trained on Body Interact, were questioned. The results of the survey showed that the 5th year students accounted for 42.5%, the 6th year - 57.5%. The respondents noted that clinical cases have the following positive aspects - they improve clinical thinking, make it possible to adapt as in real life, allow them to objectively assess their knowledge and identify their shortcomings, fairly realistic cases, the ability to analyze the basis of diagnostic and treatment methods. In addition to the positive aspects of the students, the weak points were noted, such as the choice of treatment at random, on the final assessment is not the effect of error and treatment, the difference in diagnosis and treatment protocols. The degree of their emotional stress and mental effort during training on a scale from 1 to 10 points "maximum stress" was felt by 31% of students, 9 points - 19.2%, 8 points - 17.8%, 7 points - 11.5%, 6 points - 9.5%, 1-5 points - 11% of students. At the same time, 5th-year students who had less clinical experience experienced maximum stress. 28.4% of students noted absolute confidence, followed the algorithm of actions “like a general practitioner in real life”, 48.6% of students were “confident”, and 23.2% of students were “confident”, especially when interpreting laboratory and instrumental data, as well as when prescribing treatment. 78.5% of students correspond to the level of theoretical and practical knowledge, 92.3% of cases help to improve the skills of taking anamnesis and making a diagnosis, 78% of cases use those prepared to meet with real patients, 67.8% have gained valuable experience, and 5.4 % of students were unsure.

In general, more than 80% of students note the positive impact of working with a virtual patient on the clinical development of thinking. Students studied over 40 clinical scenarios across a variety of disciplines. More than 85% of students noted that they coped with the clinical scenarios, as the level of compliance corresponded to the level. At the same time, 90% of respondents admit that clinical people use improved methods of diagnosis and medical care.

CONCLUSION

Thus, interactive virtual systems have a positive effect on the development of clinical thinking. The sense of skills and skills of uncertainty was more common among 5th-year students in clinical experience scenarios. About 90% of respondents are confident that working with a virtual patient means increasing the level of competence and skills in applying the solution for further application in clinical practice. The "Virtual Patient" curriculum is an effective

pedagogical technology and can be used in preparation for the "Internal Medicine" course in different courses. A special emotional atmosphere is created by a highly realistic professional situation, which contributes to the assimilation of educational material and improves the quality of education. Currently, a significant positive effect of virtual patient technologies in medical education and advanced training of doctors has been proven, their economic efficiency has been demonstrated in comparison with centers for modeling robotic dummies and the use of standardized patients. The possibility of remote use of Virtual patient for the formation and improvement of competence in making clinical and diagnostic decisions obvious. Virtual interactive systems are effective in improving the quality of medical education.Virtual interactive systems are effective in improving the quality of medical education.

REFERENCES:

1. Avdeeva V.G. Innovative technologies in the system of continuing medical education. Experience in training specialists for disaster medicine and emergency medical care. Medical Education and Professional Development, No. 1, 2010
2. Bulatov S.A. Teaching Practical Skills: Russian and International Experience. Medical Education and Professional Development, No. 1, 2010.
3. Murin S., Stollenwerk NS "Using simulators in teaching: a turning point" Abridged translation. Virtual technologies in medicine №1 (5) 2011.
4. Svistunov A.A., Kolysh A.L., Gorshkov M.D. The role of the medical community in the development of simulation education in Russia // Med. education and university science. - 2013. - No. 1 (3).
5. Turchina J.E., SharovaO.Ya., Nor OV, Cheremisina A.V., Bitkovskaya V.G. Simulation training as modern educational technology in the practical training of junior students of a medical university // Modern problems of science and education. - 2016. - No. 3
6. Kobayashi L., Patterson M.D., Overly F.L., Shapiro M.J., Williams K.A., Jay G.D. Educational and research implications of portable human patient simulation in acute care medicine. Academic Emergency Medicine 2008 Nov; 15 (ll): l 166-74. Epub 2008 Jul 14.