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Матеріали

науково-практичної конференції
з міжнародною участю

"Симуляційна медицина погляд в майбутнє"

(впровадження інноваційних технолоогій у вищу медичну освіту України)

м. Чернівці
19 лютого 2021

МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
БУКОВИНСЬКИЙ ДЕРЖАВНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ

МАТЕРІАЛИ

НАУКОВО-ПРАКТИЧНОЇ КОНФЕРЕНЦІЇ

З МІЖНАРОДНОЮ УЧАСТЮ,

"МЕДИЧНА СИМУЛЯЦІЯ - ПОГЛЯД В МАЙБУТНЄ"

(впровадження інноваційних технологій у вищу медичну освіту України)

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У тезах доповідей науково-практичної конференції з міжнародною участю лікарів, науковців та молодих вчених, подаються стислі відомості щодо результатів наукової роботи, виконаної учасниками конференції.

С 37Медична симуляція – погляд у майбутнє (*впровадження інноваційних технологій у вищу медичну освіту України*) (для лікарів, науковців та молодих вчених) : наук.-практ. конф. з міжнар. участю. Чернівці, 19.02.2021 року: тези доп. / Чернівці: БДМУ. – 267 с.

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These research results were analyzed by the methods of biostatistics using the software package "STATISTICA 5.0" StatSoft Inc. and Excel XP for Windows on a PC, by parametric (Student'sPtcriterion*)* and nonparametric (Fisher's Pφcriterion*)* methods of calculation.

According to the results of the questionnaire analysis there has been found that about one third of students in the I^{st} and II^{nd} groups (43,6% and 36,7% respectively) stated a sufficient level of their knowledge mainly in theoretical point of view, which indicates the need for additional practical training for graduating medical students.

It should be noted that that more than 36,4% of students in the II group but only every tenth representative of the I^{st} group (11,2%, $P\varphi<0,05$) emphasized that self-education throughout life is an important factor of self-development and successful employment. At the same time, respondents of the I^{st} and II^{nd} groups has noted with equal frequency (22,3% and 27,4% respectively; $P\varphi> 0,05$) that their self-directed learning and unsupervised work contribute to the formation of independence, initiative, discipline, accuracy, and, as well, build up responsibility of the future doctor

At the same time, according to the students' opinion, the two main following factors are contributing to the improvement of the educational process: introduction and implementation of new moderntutoring methods (33,3% and 45,4% of respondents of the I^{st} and II^{nd} groups correspondingly; $P\varphi> 0,05$) and extension of practice inside selected specialty (44,4% and 45,4% of the students in the I and II groups respectively; $P\varphi> 0.05$).

Thus, according to the survey data, among the graduating students which are specialized in the Pediatrics, the higher level of awareness of the need for continuous self-education has been found in the 6^{th}-year students in comparison with students of the 5^{th} course. At the same time, showed lack of students' practical skills into the total studied cohort dictates the necessity of expanding practical training and introduction of new innovative teaching methods among them.

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ORGANIZATION OF SIMULATION TRAINING STATIONS FOR THE DEVELOPMENT OF PRACTICAL SKILLS IN PERFORMING SUBCUTANEOUS, INTRAMUSCULAR AND INTRAVENOUS INJECTIONS

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Patient safety is fundamental to the provision of quality essential health services. Health care systems aim to prevent and reduce the risks, errors and harms that occur in patients during

the provision of healthcare [1]. WHO estimates that tens of millions of patients worldwide suffer disabling injuries or deaths each year, directly attributed to unsafe medical practices and care.
For example, unsafe injection practices in health care areas can transmit infections, including HIV and hepatitis B and C, and pose a direct danger to patients and healthcare workers. Data show that worldwide up to 40% of injections are given with reused syringes and needles without sterilization and in some countries this proportion is up to 70%. Unsafe injection practices cause approximately 1.3 million deaths each year worldwide, a loss of 26 million years of life and an annual burden of 535 million US dollars in direct medical costs [2].

The large-scale implementation in recent decades of medical training methods through simulation in the university curriculum comes to contribute complementarily to improving the development of practical skills with positive repercussions over time on the provision of quality medical services and respectively on patient safety.

Many health practitioners have experienced the use of various products (organs to learn injection techniques) or body parts (bones for intraosseous line placement) to learn procedure-specific skills. However, modern simulators take on the plastic form and allow the acquisition of basic skills in a safe, risk-free environment [3]. Part-task simulators are a continuum of the mannequin-based simulation spectrum that reproduces only a part of a complete process or system [4]. Most skill-trainers used in healthcare incorporate only the anatomical section relevant to a particular procedural skill, and there is a significant multitude of scientific papers documenting their effectiveness [5]. Simulators are often the most commonly used mode for various reasons: cost, size and risk. Partial task trainers can be used effectively to teach novices psychomotor skills and allow for the maintenance and fine tuning of expert skills [6].

The development and implementation of structured and well-organized schemes in the development of practical skills in students remains the key to success in their confidence for early application in medical practice and maintaining at a qualitative level the learned practical skills.

The initiation and organization of a comprehensive and complex training course for students with the application of the simulation method was aimed at developing practical skills in performing subcutaneous, intramuscular and intravenous injections. Skills obtained in a safe and effective environment for further application in practice with confidence and without risk. The beneficiaries of this course were medical students, those who wanted to improve their performance or learn it from scratch.

The descriptive study was attended by 43 people, students of I-VI years, Faculty of Medicine, State University of Medicine and Pharmacy" NicolaeTestemitanu". The structure of the course was innovative and complex, combining medical training on the part-task simulators with real practical work, four workstations were established, three in the University Center of Simulation in Medical Training, and the fourth placed in the University Clinic of Primary Nursing. The first three stations were organized for simulation training of the given maneuvers (1 station-subcutaneous injections, the 2nd station-intramuscular injections, the 3rd station – intravenous injections), and the 4th station in the procedure room, for performing live maneuvers to a colleague. Respectively, each student in the course passed consecutively through all four stations.

The basis of the didactic content were the current guidelines, both national [7] and international [8] for ensuring the safety of injections, as an element of the system of control of infections associated with healthcare.

As materials and methods of study the following were used: pre-test, post-test, questionnaire.

The final level of success was over 70 points after evaluating all procedures. For s/c injections it was 81±17.7, for i/m injections 85.1±16.2, and the score for i/v injections was 79.4±19.3. Compared with the baseline values (43±20.3, 51.8±16.2, and 40.9±18.3, respectively) all increased significantly ($t = -11.063$, $t = -11.088$, $t = -12.733$, respectively, $df = 42$, $p < 0.001$); the difference was 38 (95% CI 31.1, 44.9) points to the treatments to the s/c, 33.2 (95% CI 27.2, 39.3) in case of i/m and 38.5 (95% CI 32.4, 44.6) points for i/r.

The average level of satisfaction for the course offered constituted 93.7% (95% CI: 86.4, 99.0) of those surveyed. 51.6% (95% CI: 36.7, 66.6) of the respondents considered that before the given course they had sufficient theoretical knowledge to correctly perform medical interventions, and 44.2% (95% CI: 29.3, 59.0) specified that before the given course they had sufficient practical skills to correctly perform medical interventions.

98.1% (95% CI:94.1, 102.2) of the students surveyed specified as essential the application of the simulation method in the development of practical skills at the university stage before medical practice, and 91.6% (95% CI:83.4, 99.9) opted for the fact that the simulation component helped them overcome the psychological barriers for performing live maneuvers. For two characteristics (the number of repetitions of practical maneuvers during the course were sufficient and the fact that after completing this course they will have sufficient practical skills to correctly perform medical interventions) the value of 86.5% was received (95% CI:76.3, 96.7).

Regarding the experience of performing live subcutaneous (s/c), intramuscular (i/m) and intravenous (i/v) injections prior to the given course, the distribution was as follows: s/c injections performed 8 (18.6%) students, i/m injections performed 25 (58.1%) students and i/v injections performed 13 (30.2%) students, respectively. And undesirable effects for patients following the performance of all injections by students in this case were found in 13.9% (95% CI:3.6, 24.3).

As undesirable moments during the training should be mentioned three minor complications (cut when opening the ampoule) and one refusal (for performing the i/v injection in station four).

Conclusions. The method of medical training by simulation defines a high degree of satisfaction from students and is highly demanded as a complementary part of professional training at the university stage. The degree of perception of theoretical knowledge and practical skills of students increases exponentially after completing a mixed training course, with the application of simulators and the possibility of immediate live practice of acquired skills. Small groups (minimum four people) per station, a sufficient number of repetitions (minimum 2) and the establishment of pairs by mutual agreement for the collegial performance of live work in the last station provide a high level of quality of the expected result.

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THE MEANING AND CONTENT OF THE SIMULATION-BASED MEDICAL EDUCATION

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Simulation-based medical education (SBME) now is highly recommended, as a modern educational strategy directing for improving patient safety [1, 12]. All over the world, simulation training, initially developed in the 18th century, has become a mainstream of medical education. Both evidence-based medicine and procedural competency are important in attaining the goals of medical studying. Simulation, which spans from procedural training to case-based scenarios and beyond, has been implemented for all levels of learners. As shown by several reviews, this form of learning and team training is beneficial and can positively influence clinical outcomes and improve safety in the healthcare [6, 10].

SBME may be conducted in an off-site simulation (OSS) setting in simulation centers, which range widely from publically financed simulation centers at universities to simulation centers that are funded by sponsors and user payment. Introduced over the past 10 years in situ simulation (ISS) mainly comprises team-based activities that occur in the actual patient care units involving actual healthcare team members in their own working environment [8].

Content of simulation centers may be different to achieve such goals of SBME. High-fidelity simulators are life-size mannequins that can simulate multiple human functions as well as being able to communicate with the learner through a remote operator interface. Low-fidelity simulators on the other hand, which are sometimes referred to as partial or table-top simulators, are typically designed to simulate a specific aspect of the human anatomy such as an arm to practice IV starts [4]. Mannequins play an important role as the «patient» and may allow invasive procedures, such as needle decompression of pneumothorax, external cardiac compression, intubation and intravenous injection. Mannequins are typically involved in team training for medical crises and resuscitation [11].

Standardized patient is another variant of SBME content. Standardized patients are typically professional actors or readily available students or volunteers trained to simulate a variety of medical problems in a consistent, reliable, realistic and reproducible manner. The use of human actors increases the realism of the training, particularly from the perspective of patient-caregiver interactions, and further immerses the learner into the feelings and emotion of the learning experience [2, 13]. Computer-based or virtual simulation opens up constraints regarding the organization of the simulation training sessions.