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PATIENTS' SAFETY: APPLICATION OF SIMULATION METHODS FOR THE TRAINING OF SPECIALISTS IN "ENT" SPECIALTY AT THE POSTGRADUATE LEVEL

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ABSTRACT

The aim: The aim of the study was to analyze the results of the practical implementation of simulation training in educational practice at the postgraduate level at Bogomolets National Medical University, majoring in "otorhinolaryngology".

Materials and methods: The study of the opinion of intern doctors regarding the acquisition of practical skills on the clinical basis of the internship was conducted at the Department of Otorhinolaryngology (Bogomolets National Medical University). The survey was conducted according to a developed questionnaire with questions on the assessment of the acquisition of competencies and practical skills in the speciality "otorhinolaryngology" during the extramural part of the internship.

Results: The analysis of current thematic plans for the speciality "otorhinolaryngology" showed a significant number (45) of practical skills and operative interventions that an otorhinolaryngologist should master after completing the internship. The mandatory number of manipulations and medical procedures is about 3,500 during training. The results of the survey of intern doctors showed that the factors that influence the possibility of obtaining practical knowledge and skills at the clinical base of internship are: access to patients during the educational process, and the availability of sufficient amounts of medical assistance.

Conclusions: The use of simulation equipment and medical mannequins contributes to the continuous professional development of otorhinolaryngologists (acquiring modern practical skills, working out current protocols and standards of providing medical care to the population) and makes it possible to reduce the risk of defects in the provision of medical care, to prevent unintentional harm to patients at all levels of care.

KEY WORDS: postgraduate medical education, patient safety, otorhinolaryngology, simulation training

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INTRODUCTION

As a result of the reform of the medical industry in Ukraine, the work intensification of all medical workers is expected. Medical technologies are becoming more complex, and the role of informatization in the medical and diagnostic process is growing. This increases the risk of unintended harm to patients and adverse events (defects in the provision of medical care) [1].

WHO emphasizes that patient safety is a medical discipline, the emergence of which is a response to the growing complexity of the processes of providing medical services, which are accompanied by an increase in the scale of harm caused to patients in medical institutions (<https://www.who.int/ru/news-room/fact-sheets/detail/patient-safety>) [2-4].

The education and training of medical interns play an important role in shaping future medical professionals' attitudes toward safety. The main goal of the internship is for interns to acquire the competencies necessary to obtain the qualification of an otorhinolaryngologist,

and to prepare for independent medical work in compliance with the principles of academic integrity, medical ethics and deontology, evidence-based medicine.

The reform of the health care system in Ukraine actualizes the need to train competitive domestic specialists, which can be ensured by the introduction of new educational technologies. The guaranty and earnest point of the effective professional activity of future doctors is a high level of their professional competence and includes substantive (knowledge) and procedural (skill) components, namely the level of mastery of practical skills [5].

Therefore, there are new requirements for the training program of intern doctors, more specifically, the use of modern technologies that are widely available and used in the training of doctors abroad, especially in countries with a high level of economic development [6,7].

Simulation training (from Latin *simulatio* — imitation, pretence) is a method of training based on the imitation of any physical process using an artificial (for example,

mechanical or computer) system. Teaching clinical skills using mannequins, simulators, and standardized patients is the “gold standard” of medical education in the developed world [8].

THE AIM

The aim of the study was to analyze the results of the practical implementation of simulation training in educational practice at the postgraduate level at Bogomolets National Medical University, majoring in “otorhinolaryngology”.

MATERIALS AND METHODS

Programs for training specialists in the speciality “otorhinolaryngology” in Ukraine, the results of the practical implementation of simulation training in educational practice at the postgraduate level at the Bogomolets National Medical University were the research materials.

RESULTS

In Ukraine, postgraduate training of specialists in the speciality “otorhinolaryngology” lasts during 2-year specialization (internship), which all graduates of medical institutions of higher education must complete in order to obtain a clinical specialty [9]. The main goal of the internship is to increase the level of practical training of intern doctors in their professional readiness for independent medical work in their specialty [10].

In accordance with the order of the Ministry of Health of Ukraine dated June 22, 2021 No. 1254, “On approval of the Regulation on internship and secondary medical (pharmacological) specialization”, registered in the Ministry of Justice of Ukraine on August 17, 2021 under No. 1081/36703 № 1254 Internship in Ukraine has two components - theoretical and practical. Theoretical training takes place based on institutions of higher medical education. The practical component of the internship is training at workplaces in healthcare institutions. From 2022, the ratio between the theoretical and practical parts of the internship has been changed – the theoretical part is three months per academic year, and the practical part is eight months per year. In the updated internship programs, emphasis is placed on mastering practical skills by the future doctor on a clinical internship base.

The analysis of current thematic plans for the speciality “otorhinolaryngology” showed a significant number (45) of practical skills and operative interventions that an otorhinolaryngologist should master after completing the internship. The mandatory number of

manipulations and medical procedures is about 3,500 during training. For each competence, practical skills are defined in each of the ranges from A - independently, B - under the supervision of a supervisor, C - assistance D - teaches or supervises others.

Mastery level:

(A) – means that procedures qualified for independent execution;

(B) – could be performed only under supervision or as an assistant curator,

(C) – assistance,

(D) – performs, instructs, or supervises junior interns in demonstration and performance.

N.B.! Procedures qualified to be performed under supervision or assistance (B) may be performed independently at the time the speciality leader determines that the intern has sufficient competence to perform the manipulation independently.

Analysis of kinds and the number of invasive and non-invasive interventions that will help patients with acute and chronic diseases of the ENT organs (qualified for independent implementation), which should be mastered by an intern doctor after completing training in the speciality “otorhinolaryngology”, are presented in Table I.

Analysis of kinds and number of invasive and non-invasive interventions that will allow conservative and surgical care for patients with acute and chronic diseases of the ENT organs (under supervision or as an assistant curator), which should be mastered by an intern physician after completing training in the speciality “otorhinolaryngology”, are presented in Table II.

Thus, the modern internship training program in the speciality “otorhinolaryngology” includes a significant amount of practical skills and operative interventions that an otorhinolaryngologist should master upon graduation. When working independently in health care facilities (treatment and prevention facilities) of various forms of ownership and subordination, the insufficient level of mastering these can lead to the risk of adverse events (defects in the provision of medical care) that are related to patient safety.

The study of the opinion of intern doctors regarding the acquisition of practical skills on the clinical basis of the internship was conducted at the Department of Otorhinolaryngology (Bogomolets National Medical University); 36 out of 39 intern doctors took part in the survey, which was 92.3%. The survey was conducted according to a developed questionnaire with questions on the assessment of the acquisition of competencies and practical skills in the speciality “otorhinolaryngology” during the extramural part of the internship.

The degree of mastery was determined by intern

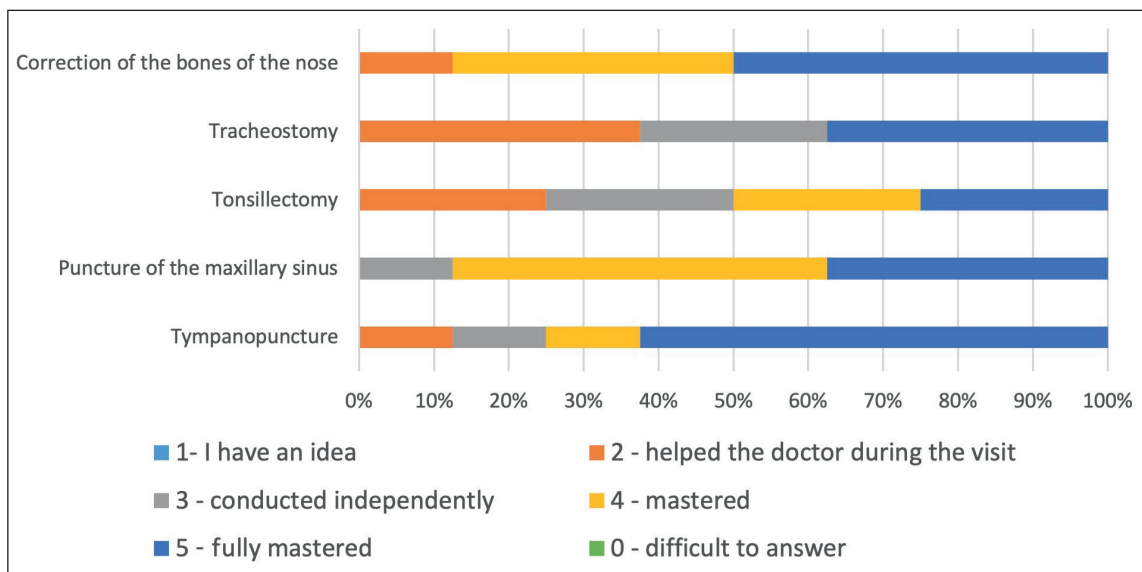


Fig. 1. Self-assessments by interns of acquiring competencies and practical skills

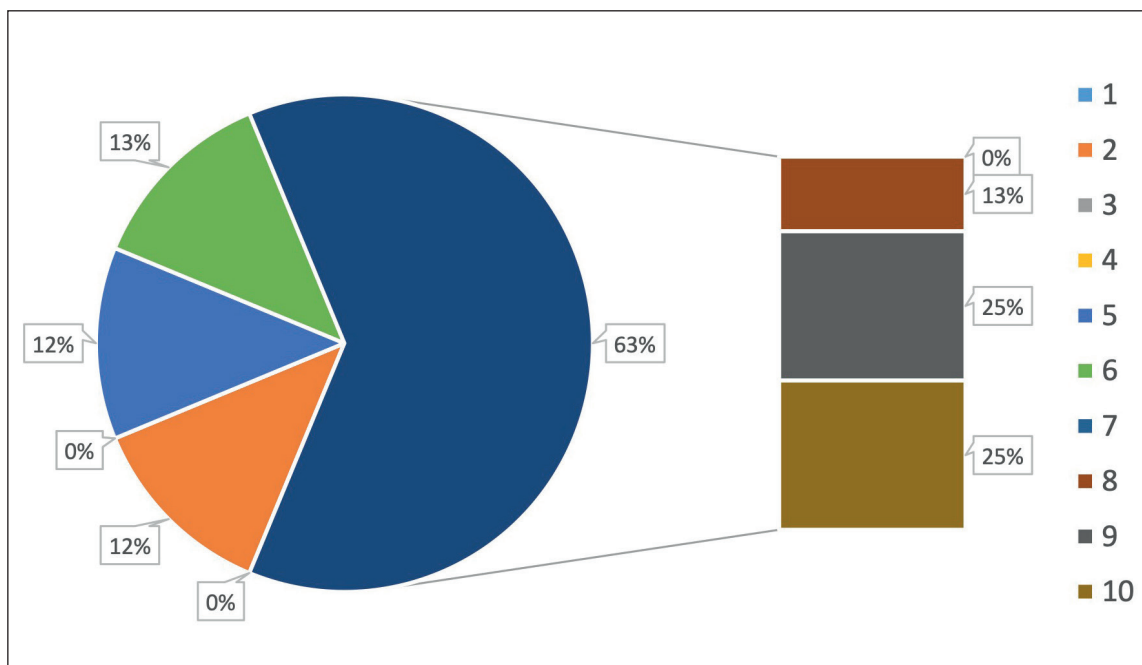


Fig. 2. Evaluation of simulation training methods (on phantoms)

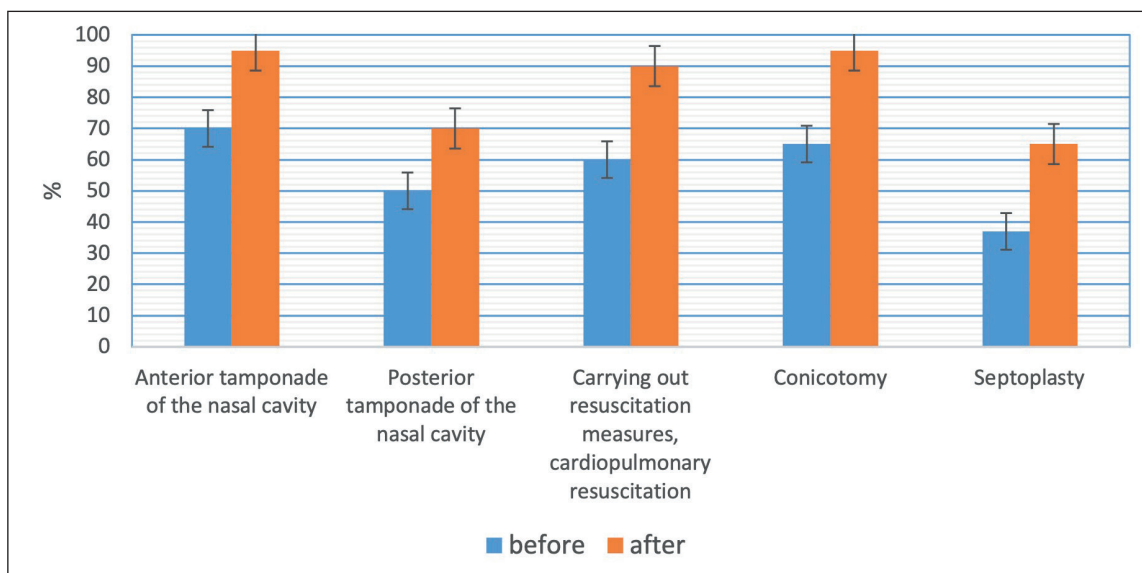


Fig. 3. Dynamics of self-assessment of the level of mastery of practical skills by doctors-interns in the specialty "otolaryngology" during simulation training

Table I. Analysis of surgical interventions of doctors-interns in the speciality “otorhinolaryngology” (qualified for independent execution)

	LIST OF OPERATIONAL INTERVENTIONS	MASTERY LEVEL	MANDATORY QUANTITY
1.	Carrying out resuscitation measures, cardiopulmonary resuscitation	A	15
2.	Tracheostomy and tracheostomy care	A	30
3.	Cricothyroidectomy	A	30
4.	Front and back tamponade	A	20
5.	Myringotomy	A	15
6.	Removal of polyps from the ear canal	A	10
7.	Installation of a ventilation shunt	A	10
8.	Restoration of the integrity of the tympanic membrane at a linear perforation	A	10
9.	Nasal surgery	A	10
10.	Incision and drainage of an abscess of the nasal septum	A	20
	Total		170

Table II. Analysis of operational interventions of intern doctors in the speciality “otorhinolaryngology” (under supervision or as assistant curator)

	LIST OF OPERATIONAL INTERVENTIONS	MASTERY LEVEL	MANDATORY QUANTITY
1.	Treatment of external ear injuries	B	30
2.	Removal of exostoses	B	5
3.	Adenotomy	B	20
4.	Tonsillectomy and tonsillotomy	B	30
5.	Methods of stopping bleeding after tonsil surgery	B	30
6.	Dissection of paratonsillar and pharyngeal abscesses	B	30
7.	Dissection of an intratonsillar abscess	B	20
8.	Removal of foreign bodies	B	30
9.	Surgical closure of the tracheostomy	B	20
10.	Nasal polypectomy	B	15
11.	Septoplasty	B	20
12.	Hymorotomy (Caldwell-Luc surgery)	B	10
13.	Frontal sinus puncture	B	10
14.	Fractures of the nose	B	20
15.	Dissection of a hematoma of the nasal septum	B	10
16.	Assessment of airway patency in newborns and children	B	10
	Total		310

Table III. Distribution of questionnaire participants depending on experience by specialty

GROUPS	NUMBER OF RESPONDENTS
interns of the first and second year	39
doctors with experience of up to 3 years	12
doctors with more than three years of experience	10

doctors according to the scale: (where 0 - it is difficult to answer, 1 - I have an idea, 2 - helped the doctor in conducting, 3 - conducted independently, 4 - mastered, 5 - fully mastered)

The results of self-assessments by interns of acquiring competencies and practical skills in performing the

most frequently performed operative interventions in the ENT hospital are presented in Fig. 1.

According to the results of self-assessment by interns (learned and completely mastered), the following operative interventions have the most considerable part (the range of assessments is more than 70%):

- "Tympanopuncture" (75%),
- "Puncture of the maxillary sinus" (88%),
- "Correction of the bones of the nose" (88%).

At the same time, according to the results of self-assessment by intern doctors (learned and completely mastered), the following surgical interventions have the smallest part (range of assessments 50% and less):

- "Tracheostomy" (38%),
- "Tonsillectomy" (50%).

In addition, the questionnaire included one question on evaluating simulation training methods (on phantoms) by definition on a scale: (where -1 is not effective at all, to -10 is very effective) and questions in an open format for the interns to express suggestions.

The results of the evaluations of intern doctors are presented in Fig. 2.

The conducted survey showed that the use of simulation training methods (on phantoms) is very effective, according to intern doctors - 76% of respondents confirmed this.

In addition, the results of the survey of intern doctors showed that the factors that affect the possibility of obtaining practical knowledge and skills at the clinical base of internship are: access to patients during the educational process and the availability of sufficient amounts of medical assistance.

Simulation trainings for interns in the speciality "otorhinolaryngology" to master some practical skills (invasive and non-invasive interventions) related to direct contact with patients were held at the Department of Otorhinolaryngology (Bogomolets National Medical University) in 2021-2023. In addition, doctors-specialists with various years of experience in the speciality "otorhinolaryngology" were involved in conducting these trainings on a voluntary basis. The study of the opinion of the training participants was carried out by means of a questionnaire before and after its implementation regarding the level of mastery of practical skills. The distribution of simulation training participants depending on their experience by speciality is presented in Table III.

The survey was conducted according to a developed questionnaire with questions to assess the importance of factors that influence the organization of the process of the correspondence part of the internship at the clinical training base.

The doctors assessed their level of knowledge before the training center session regarding the performance of all the listed manipulations as requiring improvement.

After the class was held in the simulation center with the practice of a certain list of practical skills, a repeated survey was conducted. The results of the dynamics of self-assessments of intern doctors are presented in Fig. 3.

The analysis of the dynamics of self-assessment of the level of mastery of practical skills showed that the respondents estimated their level of mastery after the training was probably higher compared to the results of the initial questionnaire. General medical experience does not affect the level of mastery of practical skills in conditions without their permanent practice and improvement.

DISCUSSION

Adverse events caused by unsafe care are among the top 10 causes of death and disability. Some researchers put unintentional harm to patients in third place among the causes of death worldwide. Reports of the Organization for Economic Cooperation and Development showed that up to 15% of the funds allocated to inpatient medical care are lost on treating consequences caused by hospital patient safety incidents [11].

In the United States alone, losses related to unintentional harm to primary and outpatient care patients exceed a trillion US dollars. But amidst these disheartening statistics, there is compelling evidence that 83% of patient safety incidents are preventable.

Unfortunately, Ukraine's healthcare reforms only exacerbate unintentional patient harm. The rapid growth of inpatient and postoperative mortality rates in recent years can testify to the patient safety problems in Ukraine. In the conditions of a patient safety incident, the second victim is the medical worker involved in this incident, whose state requires psychological and legal support.

The leading role in the prevention of medical personnel errors belongs to education. Institutions of higher medical education at the postgraduate level in Ukraine need changes and additions to curricula and programs considering patient safety issues and the development of necessary educational and methodological materials [12].

It is necessary to provide conditions under which patient safety training would contribute to forming positive behavior (safety culture) in future medical professionals. Professors and teaching staff of medical educational institutions and employees of clinical bases should not only know the educational material and be professionals but also possess simulation training methods for safe medical practice.

Implementing new learning technologies using simulation methods and medical mannequins contributes to interns' formation, mastery, evaluation, and maintenance of professional skills.

CONCLUSIONS

An otorhinolaryngologist upon completion of internship training must possess a significant amount of practical

skills, both invasive and non-invasive interventions related to patient safety. When working independently in health care institutions of various forms of ownership and subordination, an insufficient level of ownership may lead to the risk of adverse events related to patient safety.

The results of the survey of intern doctors showed that the factors that influence the possibility of obtaining practical knowledge and skills at the clinical base of internship are: access to patients during the educational

process, and the availability of sufficient amounts of medical assistance.

The use of simulation equipment and medical mannequins contributes to the continuous professional development of otorhinolaryngologists (acquiring modern practical skills, working out current protocols and standards of providing medical care to the population) and makes it possible to reduce the risk of defects in the provision of medical care, to prevent unintentional harm to patients at all levels of care.

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Conflict of interest:

The Authors declare no conflict of interest.

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