Attitude Toward Continue Medical Education and Professional Development of Emergency Medical Personnel – Cross-Sectional Study of Physicians and Nurses

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Abstract

  Aim: Postgraduate education systems for medical professionals are constantly developing worldwide. The study aims to assess the knowledge and attitude toward the importance of continuing medical education and professional development of emergency medical personnel. Methodology and Design: Quantitative method study was conducted among Georgia "GEO Hospitals" regional clinics' emergency medicine department physicians and nurses. Study design cross-sectional study. Results: The attitude towards the knowledge and training of the clinic staff is heterogeneous, regardless of their qualification, and knowledge background. In addition to basic education, motivation is important for improving knowledge. In addition, the contact method is essential in training emergency management and life-saving. Conclusion: Continuous medical staff education with effective methods is essential for improving the qualification of medical personnel. This leads to high-quality treatment, the clinic's reputation, reliability, and safe patient care.

Keywords: Emergency Team, Nurses, Physicians, Continuing medical education, Training, BL, and CPR Education

Introduction

Professional skills and knowledge are essential for patients' safe care, treatment, and delivery of health services. Based on evidence-based research results, the healthcare sector is rapidly evolving developed new guidelines, so participation in systematic postgraduate continuing education programs for doctors and nurses is a prerequisite for improving knowledge and professional skills. Knowledge update and improvement is due, in some cases, to personal and professional responsibility and, on the other hand, to state requirements.

The healthcare field is rapidly progressing in management and clinical direction. During technologies (diagnostic, treatment) developed, evidence based on facts is collected and updated, and in many cases, it changes. The latter leads to changes in treatment tactics, new treatments are developed and improved, and new emphases are identified-also as improved methods for training medical professionals. During clinical practice, staff must continuously learn, update their knowledge, adopt new guidelines and recommendations, and apply them in practice. The healthcare system's development most based on such principles and arguments as providing adequate and quality education to achieve the best clinical results, which must constantly improve and respond to modern challenges, starting from the pandemic and ending with economic factors. Raising the qualifications of healthcare workers, including nurses, is one of the healthcare system's essential priorities, as it dramatically impacts the quality and efficiency of medical services.

Along with other areas of the medical field, emergency services are also improving, both inpatient and outpatient. The development of emergency medicine in Georgia dates back two decades. In 2019, the government decree on permit conditions defined additional permit conditions for inpatients who provide emergency medical care services. In this legislative act, the infrastructural requirements, technical equipment, qualification of human resources, and the need for their continuous retraining necessity - were expressed in the establishment of constant professional education points of the critical minimum professional development standards.

For a person in a critical condition, it is often necessary to carry out life-saving measures, in particular, basic life support procedures Basic Life Support (BLS), emergency cardiology measures, Advanced Cardiac Life Support (ACLS), and emergency measures for a trauma patient The Advanced Trauma Life Support (ATLS). (Panchal, A.R et al.,2020). These conditions are one of the most critical public health problems; they are associated with a high mortality rate and represent a potentially significant burden for the country's health care due to the high probability of profound reversible neurological defects and disability. Moreover, other health problems with high

mortality rates can be considered a significant socio-economic burden for society. (Ibid).

Thorough knowledge of basic life-saving measures and their application in practice often is shown with a patient on the verge of death and life associated with cardiac and respiratory arrest, which various genesis problems can cause. By statistics, in the United States are 600,000 cardiac arrests annually. It leads to 300,000 adults and over 15,000 pediatric in-hospital cardiac arrests yearly (Holmberg, M.D. et al.,2019). Cardiac arrest occurs in the wake of several health problems (cholesterol level, blood vessel condition, blood pressure, blood glucose level) connected with the factors of a person's lifestyle and bad habits, which contribute to the health of the cardiovascular system.

Studies were conducted in different countries to assess healthcare workers' knowledge levels in cardiopulmonary resuscitation (CPR) and defibrillation. A study at the University of Pisa in Italy used prospective and observational research methods. Seventy people participated in the study; before and after the training, the trainees filled out a questionnaire (tests). The average improvement in their results before and after the training was 25-30%. Yet, 51 participants felt that their knowledge in this area was still unsatisfactory (Spinelli, G. et al.,2021)

Teaching methods and teaching materials are constantly updated. The International Liaison Resuscitation Committee (ILCOR) created a hypothetical so-called "formula for survival" (FFS), which emphasized three components: 1. Modern guidelines and their constant updating, 2. Adequate training of medical personnel, and 3. Local implementation of patient care guidelines. (Søreide, E.& et al.,2013).

Based on the results of high-quality clinical trials, different strengths of evidence are generated and based on high-strength evidence, guidelines are created and constantly updated. Among them are the guidelines provided by international organizations. For example, the American Heart Association's guidelines for teaching best practices include three main sections: 1. Study design, 2. Provider considerations and requirements, 3. Knowledge gaps (GEF) and related studies. The best instructional design is created by considering the specific goals, type of participants, and instructional context. Therefore, the teaching can be 1. purposeful and sophisticated, 2. in the continued education format, the so-called booster training, and 3. training of non-medical personnel (Basic Life support, 2021).

In targeted learning, the participant has a specific goal (threshold) to achieve; there is immediate feedback between the understanding and the learned knowledge and sufficient time for repetition to increase the ability's effectiveness. Proficiency is achieved through targeted teaching practice in parallel with testing. Testing covers a grid of critical issues representing the

criteria required to cover a specific standard. Effective targeted teaching ultimately results in better patient outcomes.

American Heart Association volunteer experts review guidelines in resuscitation selected by the AHA's Emergency Cardiovascular Council (ECC) ((AHA, 2020); (Circulation, 2020)). There is constant work on how to increase the effectiveness of teaching. It is critically important to realize what has been learned in the workplace and put knowledge into practice. That is why the teaching style is based on algorithmic systems, which makes learning more accessible and faster, and puts updated knowledge into practice. Cardiac arrest may require out-of-hospital cardiac arrest (OHCA) or In-Hospital Cardiac Arrest (IHCA) care. Therefore, the basic life-saving algorithm is taught to society's different age and professional groups. Training and retraining courses are created for healthcare workers, schoolchildren, students, rescuers, and defenders of public order (Nallamothu B.C.&etc., 2018). Instructional design should be defined in such a way that it is aimed at optimizing the achievement of the final goal. Since>500,000 cardiac arrests are reported in the United States, staff training is more likely to save lives than technological and scientific advances. (Meaney &etc.,2013).

William McGaugh, a professor of preventive medicine at the University of Chicago, and his colleagues identified at least seven characteristics of sophisticated teaching: 1. Basic knowledge assessment tool - testing (baseline); 2. Clear learning objectives arranged in order from simple to complex; 3. Involvement in the teaching process leads the student to achieve the goal (practical skills, data interpretation, calculation, Etc.). They establish evaluation criteria; and develop a threshold score for each learning topic to overcome the minimum, continue to practice and/or study until the proficiency limit is exceeded; they plan the following training to improve the results further (McGaghie, W.C., 2015). Curricula include science and research-based content that allows students to enhance their clinical practice individually and in a team setting. While training in CPR is so widespread, participants sometimes don't achieve the desired results, which leads to the fact that they need to apply the knowledge gained in actual practice with the patient.

Often, memorizing large amounts of information is beyond human capacity. In such cases, healthcare professionals are greatly helped by pocketbooks, in which concise treatment guidelines and the so-called guideline are given; also, there are various internet sources, applications, and sites containing clinical medical information. These sources help healthcare professionals to find specific details, and the information obtained often determines the planning of treatment and research. The busyness of medical personnel and modern technological trends are strong incentives for the so-called development of electronic databases and guides. Such updated and

concise information is acceptable and practical for practicing doctors. According to a study conducted by Harvard University, such a service improved the treatment outcome of patients. Ho ever, these sources provide information, and ready-made formulas, starting with calculating medication doses and ending with analyzing disease risks, the so-called Calculators. Although using such sources often improves the patient's treatment outcome, more is needed to enhance the knowledge of the medical staff. Knowing where to look for information when specific knowledge is lacking is often very useful. As a counterweight to similar Internet and other types of information sources, various types of continuing education and professional development courses, online and live training provide not only knowledge but also intuitive skills, both in assessing the patient's condition and in the immediate planning of interventions and implementation. This knowledge leads to a practical solution when the patient's condition worsens, and out in critical situations carried resuscitation measures.

The world's leading professional organizations (such as the American Heart Association, the European Resuscitation Council, Etc.), in terms of the effectiveness of resuscitation measures in emergency care, annually publish small or significant changes in the algorithmic system (Circulation. 2020). Complex resuscitation measures are learned and performed to decrease the chances of patient survival and disability. The tradition of periodic training of health care personnel employed in emergency units has been established in different countries for several decades. Teaching is conducted both online and in classrooms and laboratories. Both have strengths and weaknesses. During training in live mode, using face-to-face teaching and role-playing games, the specifics of teamwork, the moments of delegation of duties between team members, and the functions taught to each team member. In the training laboratory, manual interventions are performed on mannequins, which are purposefully created for a specific course and provide an opportunity to simulate one critical situation.

However, electronic courses, the so-called E-Learning, are becoming increasingly popular, especially during the Covid-19 pandemic. The safety of the learners and their limited time is a factors to consider.

Methodology

The study was conducted in the emergency medicine units of "GEO Hospitals" LLC regional clinics. The study employed a quantitative research cross-sectional design. "Geo-Hospitals" network of clinics includes clinics in Tbilisi and five regions of Georgia. Two of them do not have an emergency medicine department. Criteria for selecting respondents were determined by the main characteristics of the target population related to the research question - two target groups: nurses and physicians who worked in emergency

medicine (n112, P =0.5, W=0.1, CL=95%). During the preparatory period of the research, tasks were developed to analyze teaching results, evaluate the effectiveness of continuous medical education, and develop relevant recommendations.

The central part of the study included training by the training course accredited by the state of Georgia from 2021 to 2023. It was held by trainers of the training center of "Geo Hospitals" LLC. The clinical group members were certified trainers with experience in teaching and creating study materials. Based on the 2020 updated algorithms, the American Heart Association prepared the training courses. The study inclusion criteria were the participation of medical personnel who worked in the emergency department. By the account of international practice, conducted training in emergency care using the same training material for doctors and nurses; Therefore, the group included healthcare workers of both positions - 112 medical workers, including 88 doctors (78.6%) and 24 (21.4%) nurses. Each group consisted of at most 15 trainees. The training course, held in April and May 2022, covered four days (4 hours per day) for each group and took place face-to-face. Delivered theoretical material in the form of presentations, also used video-audio demonstration methods, and practical training included simulated learning. The students wrote a pre and post-test at the beginning and end of the course. In addition, after completing the course, each group answered a self-assessment questionnaire consisting of 10 closed questions.

The study's data was obtained in compliance with ethical norms. Persons involved in the study were informed about the purpose of the study in advance and gave informed consent. In processing, the results weren't used personal identification data. The teaching methods results, close by knowledge background and age, data connections, and feedback were analyzed and identified based on the research results. Research results, statistical analysis of test results, and analysis of the self-assessment questionnaire results completed by the trainees were processed in a statistical program (SPSS).

Results
Statistical analysis of test results

Data processing showed that 24 nurses and 88 doctors participated in the study. The average percentage of test results before training was 61.5%. (Table 1). After the training, the average rate of test results was 78%. The average percentage of improvement is 17%; The range is -8% to +52%. Among them, 3 participants showed worse results from -8 to 0. 12 had no improvement, 2 participants had -4%, i.e., 4% deterioration (value of 1 question = 4%), and in one case, recorded 8% deterioration. In total, 13% of the participants could not improve their results, and 87% (96 trainees) improved their knowledge, making up 20% (Table 2). Calculated improved

indicators with a confidence level of <0.001, so we can safely say that most trainees improved their knowledge, and the training was practical.

Table 1. Participating doctor, nurse

	Frequency	%	Valid%	Cumul. %
Physician	88	78.6	78.6	78.6
Nurse	24	21.4	21.4	100.0
Total	112	100.0	100.0	

Table 2. Paired-Samples T-test

		Mein	Std. Deviation	Std. Error Mean	CI – 95% Lower	Upper	t	df	W One-Sided p	Two-Sided p
Paired-Sample	PretestPretest – Post-Test	-16.714	13.168	1.244	-19.180	-14.249	-13.433	111	<.001	<.001

The test results of the participants by the cluster method showed that 112 participants were divided into three groups: 1) the largest group of trainees who improved their knowledge by 20% as a result of teaching is 67%, 2) the second largest group of trainees `who improved their knowledge by 41% is ≈18%, 3) the smallest group, whose knowledge improved by 0%, is 15% of the total number of` trainees (Figure 1);

Figure 1. Cluster distribution of learning outcomes
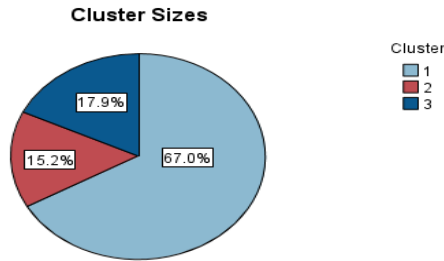
Size of Smallest Cluster	17 (15.2%)
Size of Largest Cluster	75 (67%)
Ratio of Sizes: Largest Cluster to Smallest Cluster	4.41

The minimum score in the pretest was 36%, and four trainees obtained such a score. They should note that their improvement is twice as significant as the overall average (42%). Eight trainees' maximum pretest score was 85.5%, with an average gain of 4%, which is less than five times the overall average improvement. (Figure 2); (Figure 3).

Figure 2. *Improving the results of students with the highest score*
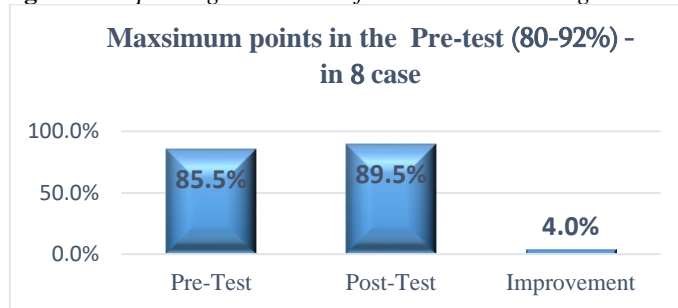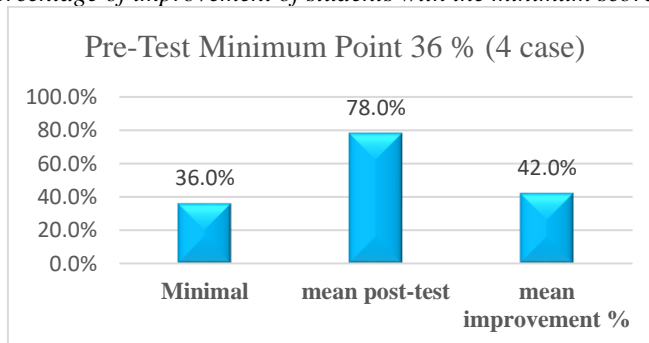

Figure 3. *Percentage of improvement of students with the minimum score in the pretest*

The percentage distribution of nurses and doctors is 21% nurses/79% doctors. Comparing the pre-and post-test results, it is clear that 12.5% of doctors failed to improve their results due to the training, while 20% of the total number of nurses failed to improve. The obtained result shows no correlation between the position held and the improvement of knowledge. This is confirmed by Pearson's chi-square test, which offers a statistical significance of 0.223. (Data is statistically significant if its Asymptotic Significance coefficient does not exceed 0.05). Therefore, by analyzing results on the relationship between position and improvement, The status of a nurse or doctor does not determine the study's outcome. (Table 3).

The statistical analysis method crosstabulation was used to determine the improvement rate's dependence on the listeners' age (Table 4); The Chi-square test shows that, in this case, there is no correlation between the two independent variables - age and improvement. Because the results of comparing relative data are statistically inconclusive, Asy. Sign=0.829 (table 5);

Table 3. *Pearson's Chi-Square Tests to Correlate Improvement in Attitude with Position*

	Total	Expected Value df	Statistical Significance
Pearson Chi-Square	21.063[a]	17	0.223
N of Valid Cases	112		

Table 4. *Improvements by age*

| | | | Improvement % | | | | |
			0.00 %	20.00 %	40.00 %	60.00 %	Total
Age	<30	Total	3	5	1	0	9
		expected improvement	1.4	6.0	1.5	.1	9.0
		% Age	33.3 %	55.6%	11.1%	0.0%	100.0 %
		% Improvement	17.6 %	6.7%	5.3%	0.0%	8.0%
	30-40	Total	2	8	2	0	12
		expected improvement	1.8	8.0	2.0	.1	12.0
		% Age	16.7 %	66.7%	16.7%	0.0%	100.0 %
		% Improvement	11.8 %	10.7%	10.5%	0.0%	10.7%
	>40	Total	12	62	16	1	91
		expected improvement	13.8	60.9	15.4	.8	91.0

	% Age	13.2 %	68.1%	17.6%	1.1%	100.0 %
	% Improvement	70.6 %	82.7%	84.2%	100.0 %	81.3%
Total	Total	17	75	19	1	112
	expected improvement	17.0	75.0	19.0	1.0	112.0
	% Age	15.2 %	67.0%	17.0%	0.9%	100.0 %
	% Improvement	100. 0%	100.0 %	100.0 %	100.0 %	100.0 %

Table 5. *Statistical validity*

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.837[a]	6	.829
Likelihood Ratio	2.566	6	.861
Linear-by-Linear Association	1.792	1	.181
N of Valid Cases	112		

Analysis of the self-assessment questionnaire completed by the trainees

The questionnaire requires the trainee to assess a subjective a) what their knowledge was like before the training, b) what it is like after the training, c) which teaching method was more effective and memorable for them, and d) how often they want to deepen and update their knowledge in this direction; e) how they evaluate the information received as a result of the training; The questionnaire includes such facts as, a) occupied position - doctor/nurse; b) age; c) whether they had undergone similar training before, if so, when; 112 (100%) participants filled out the questionnaire. Of the participants, 73 (65%) had previously taken a training course on a similar topic, and 39 had never received training on a given topic. Among those who have received training, the majority, 57%, received training more than six months ago. (Table 6); (Table 7). 8% of participants are under 30 years old, 11% are between 30-40 years old, and the vast majority, 81%, are over 40 years old. (Table 8)

Table 6. *When was the last time received training*

Data					
Dat a	<6 months	9	8.0	12.3	12.3
	>12 months	41	36.6	56.2	68.5
	6-12 month	23	20.5	31.5	100.0
	Total	73	65.2	100.0	
Los s		39	34.8		
Total		112	100.0		

Table 7. *Have received training/is attending training for the first time*

		Frequency	Percent	Valid Percent	Cumulative Percent
Data	Yes	73	65.2	65.2	65.2
	No	39	34.8	34.8	100.0
	Total	112	100.0	100.0	

Table 8. *Trainee Age*

		Frequency	Percent	Valid Percent	Cumulative Percent
Data	<30	9	8.0	8.0	8.0
	30-40	12	10.7	10.7	18.8
	>40	91	81.3	81.3	100.0
	Total	112	100.0	100.0	

Before the training, 23% of the participants estimated their knowledge to be 40%, seventy percent thought they knew 60% of the issues, 10% thought they knew 80%, and 5% knew all the problems. When asked how their knowledge improved due to the training, the majority reported a 20% increase. (Table 9); (Table 10); (Table 11)

Table 9. *Students' assessment of their knowledge before the training*

		Frequency	Percent	Valid Percent	Cumulative Percent
Data	40.00%	26	23.2	23.2	23.2
	60.00%	69	61.6	61.6	84.8
	80.00%	11	9.8	9.8	94.6
	100.00%	6	5.4	5.4	100.0
	Total	112	100.	100.0	

Table 10. *Expected improvement*

		Frequency	Percent	Valid Percent	Cumulative Percent
Data	0.00%	17	15.2	15.2	15.2
	20.00%	75	67.0	67.0	82.1
	40.00%	19	17.0	17.0	99.1
	60.00%	1	0.9	0.9	100.0
	Total	112	100.0	100.0	

Table 11. Pairwise comparative statistics, comparison T-test

		Comparison T-test						
		difference between pairs					significance	
			St. deviation	St. average mein	95% CL		One-Sided p	Two-Sided p
		main			smallest	Highest		
pair 1	PretestPretest-post-test	-16.714	13.168	1.244	-19.180	-14.249	**<0.001**	**<0.001**
pair 2	Did Know - know	-20.000	14.704	1.389	-22.753	-17.247	**<0.001**	**<0.001**

Respondent believe that they would improve by an average of 30%, and the training data shows that the average increase in knowledge, according to the scores, is 16.7%. This fact makes to think that the periodic repetition of turning will still be relevant. Data processing Two measurements were performed on the same group, one of the expected and the other of the actual results. By pairing the variables, a statistical program calculated results indicating that the training provided was generally practical and not for individual trainees—confidence ratio <0.01. Repeatedly trained trainees are more confident and rate their knowledge with high scores.

47 out of 112 (42%) choose the suitable teaching method. The second method preferred by 24% of listeners was discussion. However, doctors prefer the process of discussion and debate as the second priority. The third priority teaching method in the research group was a demonstration (19%). Furthermore, the verbal method as the most effective teaching method was named by 20% of the participants. (Table 12); (Table 13); (Figure 4)

Table 12. *The most effective source of teaching: method. Research materials*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid Scale	Demonstration	21	18.8	18.8	18.8
	Practical	47	42.0	42.0	60.7
	Verbal	20	17.9	17.9	78.6
	Discussion	24	21.4	21.4	100.0
	Total	112	100.0	100.0	

Table 13. *Which teaching method was preferred by the medical workers employed in different positions? Source: research materials. The statistical processing method: table of comparison of rows and columns of data – Crosstabulation.*

			Demonstration	Practical	Verbal	Discussion	Total
Position	physician	Total	17_a	37_a	14_a	20_a	88
		expected quantity	16.5	36.9	15.7	18.9	88.0
		% Position	19.3%	42.0%	15.9%	22.7%	100.0%
		% Method	81.0%	78.7%	70.0%	83.3%	78.6%
	Nurse	Total	4_a	10_a	6_a	4_a	24
		expected quantity	4.5	10.1	4.3	5.1	24.0
		% Position	16.7%	41.7%	25.0%	16.7%	100.0%
		% Method	19.0%	21.3%	30.0%	16.7%	21.4%
		Total	21	47	20	24	112
		expected quantity	21.0	47.0	20.0	24.0	112.0
		% Position	18.8%	42.0%	17.9%	21.4%	100.0%
		% Method	100.0%	100.0%	100.0%	100.0%	100.0%

Figure 4. *Prioritization of teaching methods according to the questionnaire*
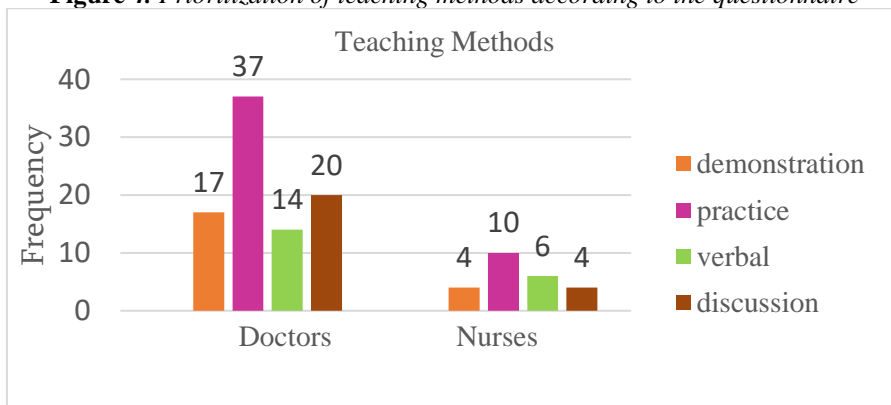
According to the results obtained based on the survey of the trainees, they consider it necessary to repeat the training at specific intervals. The possible answers in the questionnaire meant, "no need to repeat the training." It turned out that none of the 112 listeners thought so. All of them mention updating the training at any periodicity. Most of them note the interval of 6 and 12 months. 60 believe it would be appropriate to repeat the said training twice a year. Forty-one believe that they should conduct training once a year. 4% believe that repeating every two years would be good. Within the framework of the same question, we processed the same data in connection with the gender of the participants. It turned out that most women wanted to renew their studies in 6-month intervals, while the opinion of men was divided between 6-month and annual renewal. (Table 14);

Table 14. *Determining the optimal frequency of training Crosstabulation*

			Periodicity			Total
			X1 in year	X2 in year	x1 in 2-year	
Gender	Female	Total	$35_{a, b}$	61_b	2_a	98
		expected	35.9	58.6	3.5	98.0
		% gender	35.7%	62.2%	2.0%	100.0%
		% periodicity	85.4%	91.0%	50.0%	87.5%
	Male	Total	$6_{a, b}$	6_b	2_a	14
		expected	5.1	8.4	.5	14.0
		% gender	42.9%	42.9%	14.3%	100.0%
		% periodicity	14.6%	9.0%	50.0%	12.5%
Total		Total	41	67	4	112
		expected	41.0	67.0	4.0	112.0
		% Gender	36.6%	59.8%	3.6%	100.0%
		% periodicity	100.0%	100.0%	100.0%	100.0%

Discussion

Analyzing the research results allows us to conclude that the mentioned training is practical, and the trainees have increased their knowledge of basic life-saving methods. Furthermore, although a large part of the study group had previously received training related to the given topic, only some people showed 100% results in the pretest, and the majority of them were able to improve the post-test results.

Both doctors and nurses showed improvement in outcomes after the training course. It should be noted that the training course is designed for an integrated group, nurses and doctors are provided with equal material for each topic, and knowledge is assessed using the same tool. Research has also shown that improvement in ability does not correlate with age. Among the teaching

methods, practical classes and discussions were the most effective. In addition, both the doctors and nurses allocated a functional teaching style. In a survey of doctors and nurses regarding which method was found to be the most important for the effectiveness of their learning, the majority of the respondents mentioned the practical teaching method, and the said method is effective for both doctors and nurses. Specifically, by this comparison, we can logically conclude that the low level of basic knowledge is not correlated with the low absorption rate. Here we may need more information on the given topic, which in itself indicates the need for continuous medical education and qualification improvement. However, in the indicators of nurses, the deterioration was not observed, and in 3.4% of doctors, the result worsened. The study determinant, in this case, is whether there is a correlation between the improvement rate with the position. We make a hypothetical assumption that the improvement of nurses is less compared to the advancement of doctors; to confirm/disprove the premise, we applied statistical analysis using the cross-tabular comparison of these data.

Most trainees note that the training should have a permanent character, and only a few considered that repeating the activity in the future is no longer necessary. The interpretation of the test results of the objective evaluation tool supports this part of the conclusion. Although the improvement in the post-test was 17%, which is statistically reliable, we still had cases of excessive deterioration, indicating that some trainees were given more questions and not enough to be confident and perform at their best.

 The result indicates the necessity of the permanent nature of training that most trainees had higher expectations about their performance than what was actually revealed during the testing. However, it should also be noted that the optimism expressed in the self-assessment questionnaire was justified and described by improving knowledge. The material used in training was informative and up-to-date, which was noted when filling out the questionnaire, and the majority gained new information from this training. The study limitations include holding research in one region of Georgia and only in the "Geo Hospitals" network clinics, where was ER department.

Timely recognition of cardiac arrest as a result of complications of various diseases and providing first aid are essential for saving the patient's life. Therefore, knowledge of cardiopulmonary resuscitation (CPR) and defibrillation guidelines and regular personnel training will help save more lives.

Although the latest guidelines are available with the help of various sources, unfortunately, the knowledge in this direction is still not complete. According to the results of a study conducted in Tanzania, which authors view can be an example of the situation in developing and low-income countries, the country's personnel is a low level of both knowledge and skills in

cardiopulmonary resuscitation. It is necessary that the medical staff be systematically trained to improve their knowledge and practical skills and to be prepared. (Kaihula, W. T., 2018).

Let's take into account the fact that there is no licensing of nurses in Georgia. There is no mandatory postgraduate education, and the vast majority of nurses are graduates of professional education; the research results are even more enjoyable. Based on the research results, the level of education and age is not correlated with the learning results; that is, only motivation is enough. If so, why are nurses more motivated and doctors less motivated? Are we dealing with overconfidence, or do other factors require further/in-depth research? Education, motivation, and collaboration of nurses and doctors are necessary. According to the results of several studies, the attitude towards the cooperation of nurses and doctors is mixed. Teamwork for doctors and nurses includes a combination of communication and social skills and specific training in interdisciplinary work, so joint training of nurses and doctors is necessary to understand better the importance of communication and interdisciplinary work and to be able to work together. An understanding of interdisciplinarity will help both in sharing responsibility and solving problems, as well as in making essential decisions for implementing safe patient care to implement patient-centered care as a whole.

This important issue has not yet been mastered, and ''nurses and doctors still work more in parallel than together''. (Vatn, L., & Dahl, B. M.,2021). Unfortunately, society's attitude affects the prestige of the profession, also on the collaboration of health sector representatives and the formation of an interdisciplinary team. The nursing profession still needs to be perceived as an independent profession. In certain countries, including Georgia, Medicine is more important than nursing. The "priority" of Medicine is felt not only in the clinical sector but also in the academic field. Unfortunately, in many cases, ignored interdisciplinary approaches should be addressed and focused on targeted teaching. All this is a prerequisite for neglecting teamwork and multidisciplinary work, which we face in the clinical sector. (Berduzco-Torres, N et al, 2020). It is a pity that the attitude towards the relationship and collaboration between doctors and nurses was heterogeneous among the representatives of these two professions. The nurses always felt a positive attitude toward doctors. The results of the research conducted in 2003 by M. Hojat et al. again confirmed the authors' opinion.

If we take into account that the nursing profession in Georgia is not prestigious and, unfortunately, it is still under "Soviet influence", when the nurse was thought of as a doctor's support staff and not as an independent profession, we can confidently look for an explanation for the results of the research.

Conclusion

By the analysis of the research results, it would be desirable to renew the training in 6-12 months. A practical method of automating life-saving steps in emergencies is periodic training. However, the practice is implemented in developed countries, and the training frequency is individual.

When teaching the basic methods of saving a life, it is crucial to conduct the teaching using the contact method because the practical training conducted on mannequins helps to study the strength and depth of heart compressions; no other method gives a similar effect.

Taking into account the need and effectiveness of periodic training on the topic of emergency care, medical personnel also need to be trained in various areas and update their knowledge.

Both the state and private structures should take care of the organization of properly equipped training centers and the creation of a continuous training system for medical personnel, which will positively affect the qualification of medical personnel. As a result, we will get more lives saved and increase credibility with the public. Moreover, quality treatment will reduce costs for the state and the burden of disability and incapacity for work.

References:

1. *American Heart Association Guidelines for CPR and ECC*. cpr.heart.org. (n.d.). Retrieved September 12, 2022, from https://cpr.heart.org/en/resuscitation-science/cpr-and-ecc-guidelines
2. *Basic Life Support Instructor Essentials Faculty Guide*. 2021 (n.d.). Retrieved September 12, 2022, from https://ahainstructornetwork.americanheart.org/idc/groups/ahaecc-public/@wcm/@ecc/documents/downloadable/ucm_506913.pdf
3. Berduzco-Torres, N., Choquenaira-Callañaupa, B., Medina, P., Chihuantito-Abal, L. A., Caballero, S., Gallegos, E., San-Martín, M., Delgado Bolton, R. C., & Vivanco, L. (2020). Factors related to the differential development of inter-professional collaboration abilities in medicine and nursing students. *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.00432
4. Hojat, M., Gonnella, J. S., Nasca, T. J., Fields, S. K., Cicchetti, A., Scalzo, A. L., Taroni, F., Amicosante, A. M., Macinati, M., Tangucci, M., Liva, C., Ricciardi, G., Eidelman, S., Admi, H., Geva, H., Mashiach, T., Alroy, G., Alcorta-Gonzalez, A., Ibarra, D., & Torres-Ruiz, A. (2003). Comparisons of American, Israeli, Italian and Mexican physicians and nurses on the total and factor scores of the Jefferson Scale of attitudes toward physician–nurse collaborative

relationships. *International Journal of Nursing Studies*, *40*(4), 427–435. https://doi.org/10.1016/s0020-7489(02)00108-6

5. Holmberg, M. J., Ross, C. E., Fitzmaurice, G. M., Chan, P. S., Duval-Arnould, J., Grossestreuer, A. V., Yankama, T., Donnino, M. W., Andersen, L. W., Chan, P., Grossestreuer, A. V., Moskowitz, A., Edelson, D., Ornato, J., Berg, K., Peberdy, M. A., Churpek, M., Kurz, M., Starks, M. A., … Sawyer, T. (2019). Annual incidence of adult and pediatric in-hospital cardiac arrest in the United States. *Circulation: Cardiovascular Quality and Outcomes*, *12*(7). https://doi.org/10.1161/circoutcomes.119.005580

6. Kaihula, W. T., Sawe, H. R., Runyon, M. S., & Murray, B. L. (2018). Assessment of cardiopulmonary resuscitation knowledge and skills among healthcare providers at an urban tertiary referral hospital in Tanzania. *BMC Health Services Research*, *18*(1). https://doi.org/10.1186/s12913-018-3725-2

7. McGaghie, W. C. (2015). Mastery learning. *Academic Medicine*, *90*(11), 1438–1441. https://doi.org/10.1097/acm.0000000000000911

8. Meaney, P. A., Bobrow, B. J., Mancini, M. E., Christenson, J., de Caen, A. R., Bhanji, F., Abella, B. S., Kleinman, M. E., Edelson, D. P., Berg, R. A., Aufderheide, T. P., Menon, V., & Leary, M. (2013). Cardiopulmonary resuscitation quality: Improving cardiac resuscitation outcomes both inside and outside the hospital. *Circulation*, *128*(4), 417–435. https://doi.org/10.1161/cir.0b013e31829d8654

9. Nallamothu, B. K., Guetterman, T. C., Harrod, M., Kellenberg, J. E., Lehrich, J. L., Kronick, S. L., Krein, S. L., Iwashyna, T. J., Saint, S., & Chan, P. S. (2018). How do resuscitation teams at top-performing hospitals for in-hospital cardiac arrest succeed? *Circulation*, *138*(2), 154–163. https://doi.org/10.1161/circulationaha.118.033674

10. Panchal, A. R., Bartos, J. A., Cabañas, J. G., Donnino, M. W., Drennan, I. R., Hirsch, K. G., Kudenchuk, P. J., Kurz, M. C., Lavonas, E. J., Morley, P. T., O'Neil, B. J., Peberdy, M. A., Rittenberger, J. C., Rodriguez, A. J., Sawyer, K. N., Berg, K. M., Arafeh, J., Benoit, J. L., Chase, M., … Magid, D. J. (2020). Part 3: Adult basic and advanced life support: 2020 American Heart Association guidelines for Cardiopulmonary Resuscitation and emergency cardiovascular care. *Circulation*, *142*(16_suppl_2). https://doi.org/10.1161/cir.0000000000000916

11. *Circulation. 2020;142(suppl 2):S551–S579. DOI: 10.1161/CIR.0000000000000903* Spinelli, G., Brogi, E., Sidoti, A., Pagnucci, N., & Forfori, F. (2021). Assessment of the knowledge level and experience of healthcare personnel concerning CPR and early

defibrillation: An internal survey. *BMC Cardiovascular Disorders*, *21*(1). https://doi.org/10.1186/s12872-021-02009-2

12. Søreide, E., Morrison, L., Hillman, K., Monsieurs, K., Sunde, K., Zideman, D., Eisenberg, M., Sterz, F., Nadkarni, V. M., Soar, J., & Nolan, J. P. (2013). The formula for survival in resuscitation. *Resuscitation*, *84*(11), 1487–1493. https://doi.org/10.1016/j.resuscitation.2013.07.020

13. Vatn, L., & Dahl, B. M. (2021). Interprofessional collaboration between nurses and doctors for treating patients in surgical wards. *Journal of Interprofessional Care*, *36*(2), 186–194. https://doi.org/10.1080/13561820.2021.1890703