RESULTS OF TESTING BASIC KNOWLEDGE ABOUT THE ISSUES OF FIRST AID IN DIFFERENT CATEGORIES OF PEOPLE

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Timely first aid (FA) for acute conditions makes it possible to improve treatment outcomes and sometimes save human life. Assessing the basic knowledge about FA will help develop a rational system for training and dissemination of knowledge about FA. The study was aimed to perform quantitative and qualitative analysis of mistakes made by residents of Moscow and Moscow Region during assessment of their basic knowledge about FA. The questionnaire consisting of 10 questions (four possible answers, among then one correct) was created. Polling conducted before testing showed that all the respondents had basic knowledge about FA. The total study sample was 946 individuals (aged 15 years and older), it was divided into group based on the fact of having/not having medical education. It was found that the basic knowledge about FA was generally low, mainly due to the respondents having no medical education. Qualitative analysis of the answers revealed a large number of gross mistakes reflecting a high risk of wrong actions leading to deterioration of health of a victim or FA provider. The study confirms the fact of insufficient awareness of various categories of citizens, including healthcare professionals, on the issues of FA, which suggests the need to improve the system for training and dissemination of knowledge about FA across the population.

Keywords: first aid, victim, life-threatening condition, questionnaire

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РЕЗУЛЬТАТЫ ТЕСТИРОВАНИЯ УРОВНЯ БАЗОВЫХ ЗНАНИЙ ПО ВОПРОСАМ ОКАЗАНИЯ ПЕРВОЙ ПОМОЩИ У РАЗНЫХ КАТЕГОРИЙ НАСЕЛЕНИЯ

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Своевременное оказание первой помощи (ПП) при острых состояниях позволяет улучшить результаты лечения и иногда спасти человеческую жизнь. Оценка уровня базовых знаний по ПП поможет сформировать рациональную систему обучения и распространения знаний по ПП. Целью исследования было провести количественный и качественный анализ ошибок, допущенных населением Москвы и Московской области при оценке уровня их базовых знаний по вопросам оказания ПП. Разработана анкета, включающая 10 вопросов (четыре варианта ответа, один — правильный). Перед проведением тестирования методом опроса установлено, что все респонденты имели базовые знания по ПП. Общая выборка исследования составила 946 человек (15 лет и старше) и разделена на группы по наличию медицинского образования. Установлен общий низкий уровень базовых знаний по вопросам оказания ПП, преимущественно за счет респондентов, не имеющих медицинского образования. При качественном анализе ответов выявлено большое число грубых ошибок, отражающих высокий риск совершения ошибочных действий, которые приведут к ухудшению состояния пострадавшего, либо оказывающего ПП. Проведенное исследование подтверждает факт недостаточной информированности различных категорий граждан, в том числе медицинских работников, по вопросам оказания ПП, что свидетельствует о необходимости усовершенствования системы обучения и распространения знаний оказания ПП среди населения.

Ключевые слова: первая помощь, пострадавший, жизнеугрожающее состояние, анкета, информированность, знания

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Because of the recently increase in the rate of emergency situations with the large number of victims, acute conditions and injuries, training of various categories of people to provide first aid (FA) is a very important issue. Statistical research performed in Russia shows that among 70% of those in need of FA for various conditions, only 2% received it [1]. The timely and correct actions of the incident witnesses aimed to provide FA for the conditions associated with human health deterioration make it possible to not only improve treatment outcomes, but often save human life [2].

The people's willingness to provide FA is determined not only by the theoretical and practical training, but also by the fear of legal prosecution in case of possible harm to the victim during or after the FA provision [1, 4, 5].

In our country, people first encounter with the FA training at school, during classes on the basics of life safety. The

international scientific community conducts research on teaching children skills in FA provision. The data show that children can be able to properly provide FA after the FA training [6]. In our opinion, classes on FA in some educational institutions are formal: training involves the use of unapproved programs or obsolete workbooks, there are no simulators or mannequins for students to master practical skills. When organizing practical training, the FA provision algorithms should be worked out to automaticity using specific equipment and considering the category of students (discrete approach) [1, 7]. FA training is part of the complex of measures on shaping the culture of safe behavior and prevention of various risks [3, 12]. knowledge about FA and FA provision skills are in the list of job functions and professional skills of teachers, instructors and trainers [8, 9].

The rate of sudden death during P.E. classes in Russia twice exceeds that reported for other high income countries and constitutes 1.4 cases per 100,000 students or up to 200 cases annually. Injuries during P.E. classes account for 2–5% of the total number of injuries [10].

Teachers working in the Russian educational system are not competent enough in the issues of FA provision; their willingness to provide FA is generally low [3, 11]. Today, when training in a driving school, the course on FA is a mandatory component of the driver training program, while in some other educational institutions it is introduced at the initiative of managers, who understand the importance of this course for the increase in the number of individuals willing to properly provide FA. Some employers concerned conduct classes on FA as part of the occupational safety course not only every three years (in accordance with the regulatory documents), but also additionally, since they appreciate the knowledge about FA provision indicating the levels of competence, willingness, and responsibility [13–15].

Considering the above, it is obvious that at the moment it is necessary to widely disseminate knowledge about the methods and rules of providing FA for injuries, acute disorders, and other conditions. Russian legislation regulates mandatory FA training of some categories of citizens (officers of the internal affairs bodies of the Russian Federation, military personnel and employees of the State Fire Service, rescuers of the emergency rescue teams and emergency services, etc.) [16, 17] However, along with this, there is still no statutory FA training system for other categories of citizens, which stifles dissemination of knowledge on the issue. Assessment of basic knowledge about FA in the population will make it possible to determine the priority directions of the development of FA training system.

The study was aimed to perform quantitative and qualitative analysis of mistakes made by residents of Moscow and Moscow Region during assessment of their basic knowledge about FA.

METHODS

Prior to testing, a questionnaire survey was carried out that showed that all the respondents had been previously taught to provide FA during classes on the basics of life safety at school, in vocational schools, colleges, as well as in higher educational institutions and driving schools, i.e. all of them had basic knowledge about FA.

To perform quantitative and qualitative analysis of mistakes made by residents of Moscow and Moscow Region during assessment of their basic knowledge about FA, we created a special questionnaire consisting of 10 questions (four possible answers, among then one correct). Answers to the questions of the questionnaire allow one to determine potential risk to the FA provider associated with wrong actions in specific situations, possible deterioration of patient's health associated with the care provider's wrong actions, the use of medicines without the doctor's appointment at the stage of FA, understanding of new FA provision standards and technologies, being familiar with the term "first aid".

The total sample of the study was 946 people (15 years and older), it was divided into groups based on the fact of having/not having medical education.

Statistical processing of the results was performed in the Microsoft Excel-XP and STATISTICA 7 software packages.

RESULTS

Based on education, the respondents were divided as follows: 741 people (78.3%) had no medical education; 205 people (21.7%) had medical education.

When analyzing the answers to the questions of the test proposed, we performed quantitative and qualitative assessment of the common mistakes made by respondents in order to determine possible consequences for the patient and care provider in case of implementing a faulty algorithm.

It was proposed to provide care to the victim with electric shock in the following question of the test: "*What would you do, if you see a victim lying on the floor, with a broken electrical wire sticking out of the wall, which is in his/her hand, when entering the room (the victim does not respond when spoken to*)?" The right answer ("*Turn off the circuit breaker, try to pull the wire away with an insulating object (for example, with a stick, if do not know, where the circuit breaker is), call the ambulance and proceed to FA provision*" [19, 20]) was given by 505 people (53.4%) (126 medical professionals (61.5%) and 379 respondents having no medical education (51.1%)). The wrong answers were given by 441 people (46.6%), among them 79 were medical professionals (38.5%) and 362 were respondents having no medical education (48.9%). The respondents' willingness to provide care to the victim with electric shock without de-energizing the room could undoubtedly cause electric shock in the respondents.

It was proposed to provide care to the victim with carbon monoxide poisoning in the following question: "*What would you do, if you find an unconscious, breathless adult victim after entering the closed garage filled with smoke?*" The right answer to this question ("*Call the ambulance, remove the victim from the garage, start cardiopulmonary resuscitation*" [18, 20]) was given by 760 people (80.3%), among them 188 were medical professionals (91.7%) and 572 people (77.2%) had no medical education. The wrong answers were given by 186 respondents (19.7%), among them 17 (8.3%) were medical professionals and 169 (22.8%) were respondents having no medical education: they decided that removal of the victim from the room filled with smoke was not a priority, thereby exposing themselves and the victim to probable danger.

When asked about their actions in case of snake bite (the answer options were as follows: suck poison out of the wound; make a deep cross-shaped incision in the bite area and squeeze out poison with blood; cauterize the bite site with a hot metal object; none of the above), the right answer ("*None of the above*", since it is necessary to immobilize the bitten limb and put something cold on the bite site) [18, 20]) was given by 237 respondents (25.1%): 79 medical professionals (38.5%), 158 people having no medical education (21.3%). A total of 709 (74.9%) respondents (126 medical professionals (61.5%) and 583 people having no medical education (78.7%)) were ready to endanger themselves (suck snake poison out of the wound or do more harm to the patient (cauterize the bite site with a hot metal object or make a deep cross-shaped incision).

As for the question about the actions of the witness of epileptic seizure in a male aged 30–35 years ("*You are a witness of epileptic seizure in a male aged 30–35 years. What would you do?*"), the right answer ("*Place a soft cushion under the victim's head and wait until seizure is over, call the ambulance*" [21, 22]) was given by 305 respondents (32.2%), among them 112 had medical education (54.6%), 193 had no medical education (26.0%). A total of 641 (67.8%) respondents (among them 93 medical professionals (45.4%) and 548 people having no medical education (74.0%)) gave wrong answers (immediately unclench the victim's jaws to clear the airways (separately) or in combination with the correct answer, "none of the above"). While it is known that impaired breathing during seizures occurs due to the lack of adequate contraction of the respiratory muscles, and the above intervention can lead to damage to the teeth/prostheses, oral mucosal injury and, as a result, aspiration of blood and/or foreign matter (fragments of teeth) [22].

As for the question "*While in the school laboratory, you witnessed the hydrochloric acid solution getting into the child's eyes. What would you do?*", the right answer ("*Rinse the eyes with running water from nose to temple, call the ambulance*" [23]) was given by 270 respondents (28.5%), among them 44 were medical professionals (21.5%) and 226 had no medical education (30.5%). The wrong answers (immediately rinse the eyes with a weak alkali solution and put a dressing on the eyes, call the ambulance; rinse the eyes with running water from nose to temple, call "03"; none of the above) were given by 676 (71,5%) respondents (161 medical professionals (78.5%) and 515 people having no medical education (69.5): they suggested to rinse the eyes with a weak alkali solution or water from nose to temple or not to do anything of the above. It is forbidden to use neutralizers (alkali in this case) for chemical burns, since the neutralization reaction is exothermic: heat is released that can aggravate the tissue damage [24]. Furthermore, it is necessary to rinse the eyes from nose to temple in order to avoid getting the chemical into the nasolacrimal duct and prevent burn of the nasal mucosa [23].

The right answer to the question "*What would you do if you witnessed your friend choking on foreign body (while eating in the canteen), but you fail to remove foreign body, and your friend falls, loses consciousness, and stops breathing?*" ("*Start artificial respiration and chest compressions*" [18]) was given by 189 respondents (20.0%), among them 56 were medical professionals (27.3%) and 133 were people having no medical education (17.9%). The wrong answers (send someone for help, while trying to open the victim's mouth, find foreign body with the finger and remove it; wait for the arrival of medical professionals, understanding that cardiopulmonary resuscitation is useless; none of the above) were given by 757 respondents (80.0%), among them 149 were medical professionals (72.7%) and 608 were people having no medical education (82.1%). It is strictly forbidden to remove foreign bodies from the airways blindly, and what more, this delays the start of cardiopulmonary resuscitation and increases the probability that the foreign body would travel deeper into the airways.

The right answer to the question "*What would you do if you witnessed the child knocking over a pot of boiling water while visiting, and you see that the damage is extensive but superficial?*" ("*Rinse the damaged surface with cold running water for 10–15 min, call the ambulance, apply a dry sterile dressing*" [18]) was given by 313 respondents (33.1%), among them 77 were medical professionals (37.6%) and 236 were people having no medical education (31.8%). The wrong answers (immediately treat the affected surface with the Olazol or Panthenol anti-burn gel, call the ambulance and apply a dry sterile dressing; call the ambulance and apply a dry sterile dressing; none of the above) were given by 633 respondents (66.9%), among them 128 were medical professionals (62.4%) and 505 were people having no medical education (68.2%).

These questions were about the possible use of the Olazol and Panthenol anti-burn ointments for burns and hydrogen peroxide for wound treatment. According to the regulatory documents, the use of medicines at the stage of FA provision is not regulated [17]. The above medications are not included in the FA kit. It would be inappropriate to use these medications when providing FA in both cases, regardless of the respondents' education.

The question "*What is the ratio of breaths and compressions during cardiopulmonary resuscitation performed by two rescuers in an adult victim*?" assessed the respondents' knowledge about the ratio of compressions and artificial respiration in cardiopulmonary resuscitation. The right answer ("*Two breaths to 30 compressions*" [18, 20]) was given by 225 respondents (23.8%), among them 100 (48.8%) had medical education, 125 (16.9%) had no medical education. The wrong answers (one breath to five compressions; two breaths to 15 compressions; none of the above) were given by 721 respondents (76.2%). Such ratios of compressions and breaths, as 15 : 2 and 5 : 1, are noncompliant with the principles of cardiopulmonary resuscitation.

The right answer to the question "*How long should you perform cardiopulmonary resuscitation in an unconscious victim with no breathing or cardiac function*?" ("*Until medical professionals arrive*" [18, 25]) was given by 641 respondents (67.8%), among them 173 (84.4%) had medical education, 468 (63.2%) had no medical education. The wrong answers ("5 min"; "15 min", "none of the above") were given by 305 respondents (32.2%), among them 32 (15.6%) had medical education, 273 (36.8%) had no medical education.

The right answer to the question "*How to determine, whether someone is conscious?*" ("Ask the victim "*Can you hear me*?" and tap him/her on the shoulder" [18, 25]) was given by 364 respondents (38.5%), among them 144 (70.2%) had medical education, 220 (29.7%) had no medical education. The wrong answers ("based on pupils, carotid artery pulse", "based on the presence of reflexes, pupils", "none of the above") were given by 582 respondents (61.5%), among them 61 (29.8%) had medical education, 521 (70.3%) had no medical education.

DISCUSSION

Mistakes made when answering questions of the test represents the actions that can worsen the victim's condition or do harm to the FA provider, which will result in the increased number of victims at the accident site and difficulty providing skilled professional assistance. The data obtained are consistent with the results reported by Claire Louise Heard et al. (2020) after the study of collective knowledge about FA conducted based on the systematic review of 40 papers on providing FA and emergency care in emergency situations from 22 countries (mostly from Asia, Australia, Europe, and USA) and confirm that the verified collective knowledge about certain FA skills is generally low [26].

CONCLUSIONS

The quantitative and qualitative analysis of mistakes made by the respondents during assessment of their basic knowledge about FA showed that their basic knowledge was generally low;

the alarming rate of gross mistakes made when answering the questions about the respondents' potential actions during FA provision was reported. All the above demonstrates high risk of the respondents' erroneous actions resulting in the significant worsening of victim's condition and causing harm to care provider. The study conducted confirm the fact that various categories of citizens (including medical professionals) are insufficiently aware of the issues of FA provision, as well as the fact that it is necessary to improve the system for dissemination of knowledge about FA provision in the population.

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