Research Article

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News as a Means of Popularization of First Aid Knowledge: Content Analysis of News Articles Related to Cases of Pediatric Cardiac Arrest in Schools and Kindergartens of Russia

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RELEVANCE In Russia, insufficient motivation and low readiness of laypeople to provide first aid (FA) stipulate low rates of bystander cardiopulmonary resuscitation (CPR) and, as consequence, high mortality from cardiac arrest (CA). News reports on real cases of CA, in addition to describing circumstances of the event, may carry important information promoting FA provision among a wide audience. However, existing practice of presenting such content in Russian media sphere is unknown.

AIM To investigate contemporary trends for presentation of information on the problem of CA and provision of help in CA in reports of online news media on the example of a news sample about cases of pediatric CA in kindergartens and schools of Russia.

MATERIAL AND METHODS In August 2021, Google and Yandex were searched for Russian-language news reports describing cases of CA that happened in children in Russian schools and kindergartens in 2020, and structured content analysis of the news was carried out.

RESULTS The study sample consisted of 207 news reports describing 21 unique case of CA. In 76.2% cases (*n*=16) CA occurred in children at school, in 23.8% cases (5) — at kindergarten. At least in 28.6% of cases (6) Emergency Medical Services providers did not attempt CPR at arrival on scene. FA provision by bystanders was described in two cases (9.5%), provision of help by medical employees of educational organizations — in six cases (28.6%). Only in one case (4.8%) the child was transferred to a hospital after successful resuscitation. In the rest of cases (*n*=20; 95.2%) biological death was verified on scene. Information on the value of FA for saving life in CA was present in one out of 207 news reports (0.5%); and there were no reports mentioning legal aspects of FA provision, describing procedure of FA in CA, or highlighting the importance of mass public resuscitation education.

CONCLUSIONS News reports that describe cases of CA confirm high relevance of the problem, but do not carry important information related to popularization of FA knowledge. Inclusion of information on significance, principles and procedures of providing FA to CA victims into the content of the news reports is necessary for establishing positive public opinion and increasing motivation of the general population of Russia towards training in FA and FA provision. This in turn indicates the necessity for enhancing awareness of the professional journalistic community on the problem of FA provision in CA.

Keywords: cardiac arrest, death, cardiopulmonary resuscitation, first aid, news, mass media, internet, school, kindergarten, kid

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AED - automated external defibrillator
CA - cardiac arrest
FA - first aid
RF - Russian Federation
EMS - emergency medical service
CPR - cardiopulmonary resuscitation
CSCACA - Center for Syncope and Cardiac Arrhythmias in Children and Adolescents

INTRODUCTION

The ability of an eyewitness to immediately and correctly provide first aid (FA) to the victim is a key factor determining chances of a favorable outcome in out-of-hospital cardiac arrest (CA) [1, 2]. Performing basic cardiopulmonary resuscitation (CPR) by a bystander of the CA slows down the process of body dying, which significantly increases the likelihood that emergency medical service (EMS) arrives before irreversible death occurs; and early use of an automatic external defibrillator (AED) by a bystander can restore cardiac activity even before the arrival of specialists [3, 4].

Despite the fact that the importance of FA provision for saving the lives of victims with CA has been confirmed by numerous scientific works [1, 2, 5], and the necessity of more active participation of eyewitnesses in providing care has been actively promoted by the international resuscitation community for decades [4, 6], the actual rates of CPR by CA witnesses in many countries, including the Russian Federation (RF) [10], remain extremely low [7–9].

A number of sociological studies have demonstrated the limited readiness of the Russian population to provide FA, which is mainly due to the lack of knowledge and skills in FA provision, as well as the fear of harming the victim and concerns about possible legal liability [11–13]. In addition, most representatives of the general population do not consider FA provision to be their obligation [11].

It is known that popularization of basic CPR with the help of the mass media can contribute to a significant increase in the frequency of FA provided by witnesses of CA cases [14]. To increase the motivation of Russian residents to provide FA for CA, along with the creation of an effective unified FA training system [15], optimization of the mechanisms for legal regulation of FA provision and FA training [16], it is necessary to effectively inform the population about the problem of CA and the importance of FA for this state, the legal and practical aspects of FA provision, and the existing opportunities for teaching the theoretical foundations and skills of CPR.

In 2020, the share of RF residents using the Internet reached 85%, which is almost twice as much as in 2010 (43%) [17]. According to a survey conducted by the Public Opinion Foundation in January 2021, 56% of Russians read or watch news or information reports on the Internet [18]. News reports about CA cases attract public attention and, aside from reporting on a single incident, may carry additional information that promotes FA provision and education to a wide audience [19, 20], which determines the importance of studying trends in covering CA cases in media reports.

The aim of the present study was to analyze the content of news reports published on the Internet on CA cases. The study sample consisted of reports on CA cases in children in pre-school educational institutions and general educational organizations in Russia in 2020.

MATERIAL AND METHODS

The search for online media reports was carried out in August, 2021 in the two most popular search engines in Russia — Google and Yandex. In each system, 10 search queries were performed for keyword combinations: "news" + "school" or "kindergarten" + "child" + "death" or "died" or "cardiac arrest" or "passed away". Search results were limited in search engine settings to 2020 calendar year. The process of selecting messages for the study is schematically shown in the Figure.

For each search query, 100 first search results were sequentially screened in order to select news reports that meet the following inclusion criteria: a report from a Russian-language news site describing a case of clinical and (or) biological death in a pupil/student of a preschool educational institution or a general educational organization in Russia, occurred on the territory of this educational organization in the period from January 1 to December 31, 2020.

If, as part of the screening, external links to reports on other CA cases that met the inclusion criteria for the study were found in the text of the reports, then such additional results were included in further analysis along with the main ones.

In order to save and organize the results that meet the inclusion criteria, and to remove duplicates, the bibliographic reference management software Zotero (Corporation for Digital Scholarship, USA) was used.

Two experts independently analyzed the content of all the reports included in the study and entered into a pre-tested table the following data: date of publication, date of the incident described, region and locality of the scene, type of educational organization (school/kindergarten); information about the victim: gender, age, school grade (if applicable), information about risk factors for CA development; the alleged cause of CA; circumstances of CA development (in class / outside class, during physical activity / without physical activity); information about FA provision and medical assistance (by whom and to what extent assistance was provided); the outcome; an emphasis in the report on the problem of CA as a whole (yes/no), information about the importance of FA provision (yes/no), the principles and rules for FA provision (yes/no), criticism of the actions of employees of the educational organization / eyewitnesses of the incident (yes/no)), as well as information on procedural measures taken by law enforcement agencies.

The results obtained by the experts were compared. In case of discrepancies, the results were agreed upon through discussion.

Descriptive statistics methods were used to present the data.

RESULTS

After screening 2000 primary search results and removing duplicates, 206 news site posts were identified describing cases of CA development in children in schools and kindergartens of Russia in 2020. One of the news reports described 2 CA cases. Accordingly, the final sample for analysis consisted of 207 case descriptions (hereinafter referred to as reports), which contained information on 21 unique CA cases (see figure).

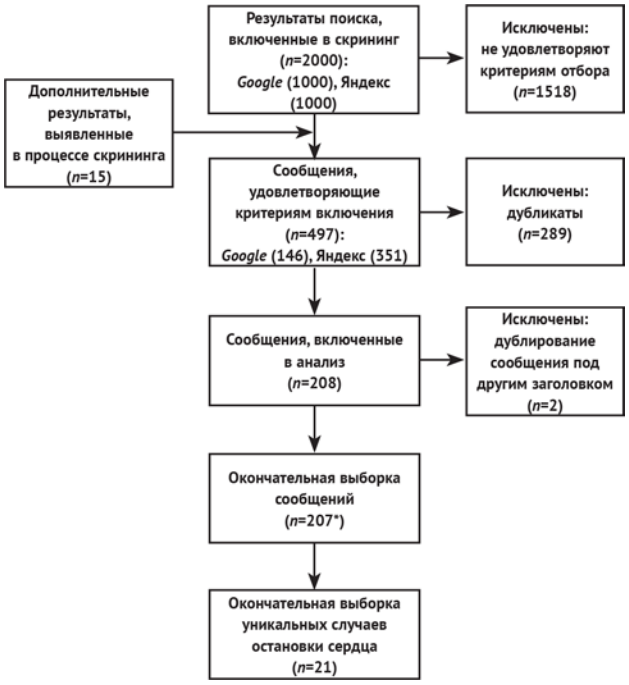

Figure. Scheme of sequential selection of research objects.

Note: * — of the news reports described 2 cases of cardiac arrest, so this article was counted twice in the final sample

CHARACTERISTICS OF CARDIAC ARREST CASES

CA cases occurred in 15 subjects of the RF. Seventeen CA cases (81.0%) occurred in cities, 3 cases (14.3%) - in rural settlements, for one case (4.8%) there was no information about the type of settlement. In 16 cases (76.2%) CA developed in children at school, in 5 cases (23.8%) in kindergarten. The victims were predominantly male children (n=15, 71.4%). The average age of the victims was 10.5 years (standard deviation = 5.7, median = 13, interquartile range: 15–4 = 11). The age distribution was as follows: 1 years old and 3 years old - one case each; 4 years old - 3 cases; 9 years old, 11 years old, 13 years old, 14 years old - one case each; 15 years old - 4 cases; 17 years old - 2 cases. For the remaining 6 cases, there was no information on the age of the victim (for three of them, school grade was reported - 8th, 9th and 10th).

According to the information provided in the reports, the causes of CA in kindergarten children were mechanical asphyxia (2 cases of asphyxia due to foreign body aspiration and one case of asphyxia due to compression between the enclosing elements of a play complex), and trauma (one case - blunt cervical trauma resulting in spinal cord injury due to the head stuck between the partitions of a gaming complex). For one case, no cause was reported.

The circumstances of CA development in schools were as follows: physical activity during physical education lessons (n=4) or sports competitions (1); in the classroom, without physical activity (2); outside the classroom without physical activity (2); outside the classroom, during physical activity or not was unknown (5); under unknown circumstances (2). In one case, CA was apparently caused by trauma (wound due to ammunition detonation). For all other cases, the information provided in the reports was insufficient to establish the exact cause of CA. For 7 cases, the child was reported to have a health problem (eg, congenital disease, heart disease, chronic disease).

First aid provision was described for 15 CA cases (71.4%) in kindergartens and schools. Of them:

• for 7 cases (33.3% of the total number of CA cases), it was reported that FA was provided only by EMS workers (with attempted CPR);

• for 4 cases (19.0%), it was reported that FA was provided by a medical worker of the educational organization (CPR - 3; without specifying the amount of assistance - 1) followed by CPR performed by EMS staff;

• for 2 cases (9.5%), it was reported that FA was provided by a medical worker of the educational organization (CPR - 1; without specifying the amount of assistance - 1) without subsequent attempts to perform CPR by EMS staff;

• for one case (4.8%), it was reported about FA provision (without specifying who and to what extent provided the assistance) followed by CPR by EMS staff;

• for one case (4.8%), it was reported that FA was provided (CPR) by a relative of the child, followed by CPR by EMS staff.

In 95.2% of cases (n=20) CA led to irreversible death at the prehospital stage. Of these, in at least 6 cases (28.6% of the total number of CA cases), the EMS specialists arrived at the scene did not attempt to perform CPR at all. Only in one case (4.8%), which was accompanied by CPR by an eyewitness (relative) and the arrived ambulance team, the child was hospitalized after successful resuscitation (the child died later that day).

For 17 CA cases (81.0%), the reports provided information on measures of procedural justice implemented by law enforcement agencies, namely: a preliminary investigation was carried out - 8 cases (38.1%); a criminal case was initiated - 7 cases (33.3%); a decision was made to refuse to initiate a criminal case - one case (4.8%); a guilty verdict was issued (a kindergarten teacher was found guilty of committing a crime under Article 109 part 2 of the Criminal Code of the Russian Federation “Causing death by negligence due to improper performance of the person's professional duties”) - one case (4.8%).

CHARACTERISTICS OF NEWS REPORTS ON CARDIAC ARRESTS

The number of reports describing the same CA case ranged from 1 to 53 (median = 6, interquartile range: 10–1 = 9).

44.0% of the reports (91 out of 207) were published on the day of the incident, 33.3% (69) - the next day. The interval from the day of the incident to the day of publication of the report ranged from 0 to 250 days (median = 1, interquartile range: 1–0 = 1).

The content of 58.0% of the reports (n=120) did not allow us to judge whether attempts were made to provide FA or medical assistance to CA victims.

FA provision before the ambulance arrived at the scene was mentioned in 14.0% of the reports (n=29), including: FA provision by a medical worker - 10.1% of the reports (21); by an employee of the educational institution (without specification) — 2.4% (5); by a relative of the victim - 0.5% (1); without specifying the person who provided assistance - 1.0% (2).

A total of seven reports (3.4%) describing 3 CA cases, in addition to describing the specific incident, contained language that drew attention to the problem of CA or sudden death. For example: “This is far from the first death in kindergarten”, “Sudden cardiac death occurs unexpectedly [...] It happens, including in people without diagnosed cardiovascular problems”, “I want to understand the reasons why a guy in the prime of his youth dies so accidentally “.

Two reports (1.0%) contained critical remarks regarding the failure to provide the necessary assistance to CA victims by employees of educational organizations.

Only one report (0.5%) included information on the life-saving value of FA in CA, pointing to the importance of educators being trained in CPR, and schools equipped with automated external defibrillators (AEDs).

None of the reports mentioned the legal aspects of providing and teaching FA, described the rules of FA provision in CA, gave links to external resources with information about FA.

DISCUSSION

Official statistics characterizing cases of CA development in students and pupils in educational institutions of the Russian Federation and the effectiveness of assistance in such cases are not available due to the lack of unified CA epidemiological surveillance in this country [21–23]. In 2017, at a meeting of the Federation Council, the head of the Ministry of Education and Science announced that in the 2016–2017 academic year, 211 schoolchildren died during physical education classes in Russia [24], but the source of these data was not specified and subsequently similar figures were not made public.

The search for original domestic studies on the analysis of CA cases in children in schools and kindergartens in Russia revealed two works [23, 25]. L.M. Makarov et al. (2018) studied cases of CA and sudden death among Russian schoolchildren, based on the materials of the joint Register of Sudden Death of the Center of Syncope and Cardiac Arrhythmias in Children and Adolescents (CSCACA) of the Federal Medical and Biological Agency (FMBA) of Russia and the regional public organization for the prevention of sudden arrhythmic death syndrome in children and adolescents "Khrustalnoye serdtse" [25]. The sample of the study consisted of 144 cases of sudden death of children aged 7–18 years, accumulated by the register over 16 years of monitoring (2002–2018) based on the CSCACA’s own clinical observations, information about the sudden death of children from Russian-language Internet search engines and the media, as well as forensic medical results. J.V. Gudinova and Yu.V. Zharkova (2019) conducted an information search, and as a result the authors managed to find information about 47 cases of death of schoolchildren during physical education classes in Russia for the period from 2008 to 2017: 38 cases - from the publications of the Investigative Committee of the Russian Federation, 1 - from the publication of the Prosecutor General's Office of the Russian Federation, and 8 — from the media [23].

The mentioned works present the distribution of deaths by sex and age of victims [23, 25], type of physical activity during which death occurred [25], causes of death with assessment of seasonality [23]. The authors of the studies emphasize the relevance and significance of the problem of sudden death in childhood during physical education classes and the adoption of measures aimed at improving the efficiency of FA provision in Russian schools [23, 25], focusing on the need to create a federal register of such cases [23].

The present study, based on the analysis of news reports about CA cases on the Internet for 2020, on the one hand, characterizes FA provision for CA victims among students and pupils of educational institutions in Russia, and, on the other hand, reflects the existing domestic practice of covering relevant cases in online news.

Our analysis of individual CA cases showed a low frequency of FA provision before the arrival of EMS specialists at the scene. Judging by the information provided in the news reports, medical workers of educational organizations provided assistance in only 6 out of 21 cases (29%), while attempts to provide FA by witnesses of the incident were made in only 2 CA cases (10%).

In case of out-of-hospital CA, the probability of survival is extremely dependent on the promptness of care. Due to severe hypoxia, every minute of delay in CPR is accompanied by a decrease in the chances of recovery by

approximately 10% [26]. Considering that the time required for the EMS to arrive to the CA victim often exceeds 10 minutes [10, 27], the immediate and continuous provision of basic CPR by bystanders before the start of EMS care is certainly vital [2, 28].

The infrequent and late delivery of care prior to EMS arrival may explain the lack of survival in the present study sample. The untimely FA provision is indicated by the fact that in 95% of cases biological death was ascertained already at the pre-hospital stage, and in at least 29% of cases, EMS staff did not attempt CPR at all after arriving at the scene, apparently due to the identification of signs of biological death during the initial assessment of the victims' condition.

Given the methodological limitations of this study (see below), the above results cannot be considered an accurate reflection of the actual practice of FA provision in CA cases in children in schools and kindergartens in Russia, however, in general, the presented picture is consistent with the known problems in the functioning of the prehospital care system in the Russian Federation, including insufficient motivation of the population to provide FA and low actual frequency of CPR performance by witnesses of the incident [10–13].

Our analysis of the totality of news reports describing CA cases in children in educational institutions clearly shows the shortcomings of the mass presentation of information about the problem in the domestic information space.

The most significant observation, in our opinion, is the complete absence in the vast majority of news reports of any mention of the need to provide FA by CA witnesses. Moreover, a small number of reports describing real cases of assistance provided by eyewitnesses of the incident and medical workers of educational institutions (14%) can be explained both by the incompleteness of operational information (more than 77% of reports were published in the first two days after the relevant events) and the low actual frequency of FA provision before the EMS arrival. Only one of 207 reports (0.5%) mentioned the importance of the ability of teachers to conduct CPR, and none of the reports touched upon the legal regulation of FA provision in the Russian Federation (in terms of explaining the rights, duties and responsibilities in connection with the provision or non-provision of first aid), indicated the significance of widespread training of the population in CPR skills, described the general algorithm of actions or the rules of FA provision in CA cases.

Similar results, but with a higher frequency of information presentation that promotes FA in the news, are described in the work of T. Scquizzato et al. (2021) [20]. The authors analyzed 369 online news reports about 255 unique cases of out-of-hospital CA that occurred in Italy in 2019. The study found that 11% of the reports contained some kind of information that teaches CPR techniques or encourages readers to receive training. In particular, 9.2% of the news emphasized the importance of performing basic CPR and (or) the use of AED by CA witnesses and of training in basic CPR courses; 2.4% explained the pathogenesis of CA and described the principle of AED operation; 2.0% covered projects aimed at promoting knowledge about AED public access programs. In order to improve the efficiency of presenting information about CA in the news, the authors of the Italian study developed and made freely available a multimedia kit for journalists containing brief information about the problem of CA and the principles of providing FA for this condition [20].

LIMITATIONS

When interpreting the results of this study, it should be taken into account that news reports describing CA cases may contain incomplete and/or incorrect information, and an undetermined number of CA cases that potentially meet the inclusion criteria for this study may have been omitted due to lack of media coverage or search strategy limitations. Therefore, the results of the study cannot be considered representative of the entire set of cases of CA development in children in Russian educational institutions in 2020.

At the same time, it is unlikely that the participation of witnesses in FA provision should be underestimated, since reports of CA cases accompanied by FA provision, as a rule, are of particular interest to the public and have a greater chance of media coverage compared to other CA cases [19].

CONCLUSION

High mortality in out-of-hospital cardiac arrest, largely due to the inability or unwillingness of the vast majority of eyewitnesses to attempt cardiopulmonary resuscitation before the arrival of emergency medical professionals, determines the need to increase the motivation and readiness of the population to provide FA. To this end, along with increasing the availability of high-quality first aid training and improving the current system of legal regulations in Russia in the field of organizing first aid (including with regard to the conditions and

frequency of first aid training, monitoring and ensuring the quality of training and optimizing measures of legal incentives for first aid) [16, 29], it is necessary to form an objective public opinion about the problem of cardiac arrest and the importance of providing first aid to save lives.

News coverage of cardiac arrest cases creates such an opportunity, however, as far as one can judge from the results of this study, to date, news reports mainly carry limited primary information about the event, characterizing the victims, circumstances and outcome of the incident, the procedural measures carried out by law enforcement agencies, and, in rare cases - describe FA provision. At the same time, the news practically does not contain key information that promotes FA provision in case of cardiac arrest and motivates to provide it.

In this regard, it seems important, firstly, to raise awareness of the professional journalistic community about the problem of cardiac arrest, the significance and principles of first aid in this condition; secondly, to ensure a broad and correct presentation of information essential for the promotion of first aid in the content of news reports.

Currently, the following public Russian-language Internet resources can be recommended as sources for raising awareness of the journalistic community and readers of news sites on the issues of first aid in case of cardiac arrest:

1) the massive open online course "First Aid in Cardiac Arrest (Basic Resuscitation)", stepik.org/course/13222 [30] developed by the Crimean Simulation Center for Emergency Medicine in accordance with the recommendations of the European Resuscitation Council [3, 31], reviewed, scientifically tested [32, 33];

2) the website "All about first aid", allfirstaid.ru [34] - an information resource and working platform of the Profile Commission of the Ministry of Health of the Russian Federation in the direction of "First Aid"; it contains instructions for providing first aid in life-threatening conditions, including CA, information about the legal aspects of first aid in Russia, a variety of educational and methodological materials on first aid, including an educational and methodological complex recommended by the Ministry of Health of the Russian Federation.

FINDING

1. The content of news reports on cases of cardiac arrest in children in schools and kindergartens in Russia confirms the high relevance of this problem and indicates the need for active involvement of the population in the process of providing first aid.

2. News stories describing cases of cardiac arrest do not carry information that promotes first aid. Inclusion in the news content of information about the significance, principles and rules of FA provision by witnesses of cardiac arrest can drastically increase the motivation and readiness of the population for first aid training and provision, contribute to the reduction of mortality in CA, which determines the need to increase the awareness of the professional journalistic community on the problem of first aid in cardiac arrest.

REFERENCES

1. Christensen DM, Rajan S, Kragholm K, Søndergaard KB, Hansen OM, Gerds TA, et al. Bystander cardiopulmonary resuscitation and survival in patients with out-of-hospital cardiac arrest of non-cardiac origin. *Resuscitation*. 2019;140:98–105. https://doi.org/10.1016/j.resuscitation.2019.05.014
2. Yan S, Gan Y, Jiang N, Wang R, Chen Y, Luo Z, et al. The global survival rate among adult out-of-hospital cardiac arrest patients who received cardiopulmonary resuscitation: a systematic review and meta-analysis. *Crit Care.* 2020;24(1):61. https://doi.org/10.1186/s13054-020-2773-2
3. Olasveengen TM, Semeraro F, Ristagno G, Castren M, Handley A, Kuzovlev A, et al. European Resuscitation Council Guidelines 2021: Basic Life Support. *Resuscitation*. 2021;161:98–114. https://doi.org/10.1016/j.resuscitation.2021.02.009
4. Semeraro F, Greif R, Böttiger BW, Burkart R, Cimpoesu D, Georgiou M, et al. European Resuscitation Council Guidelines 2021: Systems saving lives. *Resuscitation*. 2021;161:80–97. https://doi.org/10.1016/j.resuscitation.2021.02.008
5. Valenzuela TD, Roe DJ, Cretin S, Spaite DW, Larsen MP. Estimating effectiveness of cardiac arrest interventions: a logistic regression survival model. *Circulation*. 1997;96(10):3308–3313. https://doi.org/10.1161/01.cir.96.10.3308
6. Standards and guidelines for Cardiopulmonary Resuscitation (CPR), and Emergency Cardiac Care (ECC). National Academy of Sciences–National Research Council. *JAMA*. 1986;255:2905–2984. https://doi.org/10.1001/jama.1986.03370210073024
7. El Sayed MJ, Tamim H, Nasreddine Z, Dishjekenian M, Kazzi AA. Out-of-hospital cardiac arrest survival in Beirut, Lebanon. *Eur J Emerg Med*. 2014;21(4):281–283. https://doi.org/10.1097/MEJ.0000000000000088
8. Krishna CK, Showkat HI, Taktani M, Khatri V. Out of hospital cardiac arrest resuscitation outcome in North India - CARO study. *World J Emerg Med.* 2017;8(3):200–205. https://doi.org/10.5847/wjem.j.1920-8642.2017.03.007
9. Al Hasan D, Yaseen A, El Sayed M. Epidemiology and Outcomes from Out-of-Hospital Cardiac Arrest in Kuwait. *Emerg Med Int*. 2020;2020:9861798. https://doi.org/10.1155/2020/9861798
10. Birkun AA, Frolova LP, Buglak GN, Olefirenko SS. Out-of-hospital Cardiac Arrest in the Republic of Crimea: Analysis of Epidemiology and Practice of Care. *Russian Sklifosovsky Journal "Emergency Medical Care"*. 2020;9(3):338–347. (In Russ.). https://doi.org/10.23934/2223-9022-2020-9-3-338-347

11. Dezhurny LI. *Nauchnoe obosnovanie i razrabotka sistemy mediko-organizatsionnykh meropriyatiy pervoy pomoshchi pri travmakh i neotlozhnykh sostoyaniyakh na dogospital'nom etape: dr. med. sci. diss.* Voronezh: Voronezhskaya gos. med. akademiya im. N.N. Burdenko, 2006. (In Russ.).
12. Kucherenko V, Garkavi A, Kavalersky M. First aid readiness in the population at a road traffic accident. *Vrach*. 2009; 12:82. (In Russ.).
13. Birkun AA, Kosova YA. Readiness of the Crimean population to perform cardiopulmonary resuscitation in out-of-hospital cardiac arrest. *Social aspects of population health*. 2019;65(1):5. (In Russ.). https://doi.org/10.21045/2071-5021-2019-65-1-5
14. Becker L, Vath J, Eisenberg M, Meischke H. The impact of television public service announcements on the rate of bystander CPR. *Prehosp Emerg Care*. 1999;3(4):353–356. https://doi.org/10.1080/10903129908958968
15. Dezhurny LI, Gumenyuk SA, Zakirov RR, Maksimov DA, Trofimenko AV. First aid in the Russian Federation. Latest changes and near prospects. *Kremlin Medicine Journal*. 2019;3:15–22. (In Russ.). https://doi.org/10.26269/4q8v-ym04
16. Birkun AA, Dezhurny LI. Legal and Regulatory Framework for Provision of First Aid and Education in First Aid in Out-of-Hospital Cardiac Arrest. *Russian Sklifosovsky Journal Emergency Medical Care*. 2021;10(1):141–152. (In Russ.). https://doi.org/10.23934/2223-9022-2021-10-1-141-152
17. The World Bank. *Individuals using the Internet (% of population) – Russian Federation. International Telecommunication Union (ITU) World Telecommunication/ICT Indicators Database*. 2021. Available at: https://data.worldbank.org/indicator/IT.NET.USER.ZS?locations=RU [Accessed Oct 7, 2021]. (In Russ.).
18. Fond Obshchestvennoe Mnenie. *Istochniki informatsii: internet. Vostrebovannye istochniki informatsii v internete*. 2021. Available at: https://fom.ru/SMI-i-internet/14538 [Accessed Oct 7, 2021]. (In Russ.).
19. Field RA, Soar J, Nolan JP, Perkins GD. Epidemiology and outcome of cardiac arrests reported in the lay-press: an observational study. *J R Soc Med*. 2011;104(12):525–531. https://doi.org/10.1258/jrsm.2011.110228
20. Scquizzato T, Gazzato A, Semeraro F, Landoni G, Ristagno G, Scapigliati A. Cardiac arrest reported in newspapers: A new, yet missed, opportunity to increase cardiopulmonary resuscitation awareness. *Resuscitation*. 2021;160:68–69. https://doi.org/10.1016/j.resuscitation.2021.01.002
21. Moskvicheva AA, Borisov AN. Cases of sudden deaths of schoolchildren and students during physical training. *Science Almanac*. 2016;12–2(26):340–343. (In Russ.). https://doi.org/10.17117/na.2016.12.02.340.
22. Birkun AA, Altukhov AV. The Registry as a Basis for Epidemiological Surveillance and Optimization of Care in Out-of-hospital Cardiac Arrest. *Russian Sklifosovsky Journal "Emergency Medical Care"*. 2018;7(3):234–243. (In Russ.). https://doi.org/10.23934/2223-9022-2018-7-3-234-243
23. Gudinova ZhV, Zharkova YuV. Research on cases of death of pupils at the lessons of physical culture in Russia. *Academic Journal of West Siberia*. 2019;1(78):29–33. (In Russ.).
24. Online edition Lenta.ru. *Na urokakh fizkul'tury za god pogibli 211 rossiyskikh shkol'nikov*. 2017. Availlable at: https://lenta.ru/news/2017/10/09/deadscool [Accessed Oct 7, 2021]. (In Russ.).
25. Makarov LM, Komolyatova VN, Kiseleva II, Solokhin YuA. Cardiac arrests and sudden death of children in schools. *Pediatriya. Zhurnal im G.N. Speranskogo*. 2018;97(6):180–186. (In Russ.). https://doi.org/10.24110/0031-403X-2018-97-6-180-186
26. Larsen MP, Eisenberg MS, Cummins RO, Hallstrom AP. Predicting survival from out-of-hospital cardiac arrest: a graphic model. *Annals of Emergency Medicine*. 1993;22(11):1652–1658. https://doi.org/10.1016/s0196-0644(05)81302-2
27. Bürger A, Wnent J, Bohn A, Jantzen T, Brenner S, Lefering R, et al. The Effect of Ambulance Response Time on Survival Following Out-of-Hospital Cardiac Arrest. *Dtsch Arztebl Int*. 2018;115:541–548. https://doi.org/10.3238/arztebl.2018.0541
28. Holmberg M, Holmberg S, Herlitz J. Effect of bystander cardiopulmonary resuscitation in out-of-hospital cardiac arrest patients in Sweden. *Resuscitation*. 2000;47:59–70. https://doi.org/10.1016/s0300-9572(00)00199-4
29. Zakurdaeva AYu, Dezhurnyy LI. Legal aspects of first aid providing by medical workers. *Meditsinskoe pravo: teoriya i praktika.* 2018;1(7):25–31. (In Russ.).
30. Birkun A.A. *Pervaya pomoshch' pri ostanovke serdtsa (bazovaya reanimatsiya).* Available at: https://stepik.org/course/13222/syllabus [Accessed Oct 7, 2021]. (In Russ.).
31. Perkins GD, Handley AJ, Koster RW, Castrén M, Smyth MA, Olasveengen T, et al. European Resuscitation Council Guidelines for Resuscitation 2015: Section 2. Adult basic life support and automated external defibrillation. *Resuscitation*. 2015;95:81–99. https://doi.org/10.1016/j.resuscitation.2015.07.015
32. Birkun A. Distant Learning of BLS Amid the COVID-19 Pandemic: Influence of the Outbreak on Lay Trainees' Willingness to Attempt CPR, and the Motivating Effect of the Training. *Resuscitation*. 2020;152:105–106. https://doi.org/10.1016/j.resuscitation.2020.05.023
33. Birkun AA, Dantanarayana VR. Open Online Course on Basic Cardiopulmonary Resuscitation: Investigation of an Audience and the Effects of Distant Training. *General Reanimatology*. 2020;16(2):52–63. (In Russ.). https://doi.org/10.15360/1813-9779-2020-2-52-63
34. *Vse o pervoy pomoshchi. Partnerstvo professionalov pervoy pomoshchi*. Available at: https://www.allfirstaid.ru [Accessed Oct 7, 2021]. (In Russ.).

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