


Basic Resuscitation Training for Third-Cycle Primary School Students: A Qualitative Research of Training Providers' Experiences

INQUIRY: The Journal of Health Care Organization, Provision, and Financing
Volume 59: 1–8
© The Author(s) 2022
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/00469580221127134
journals.sagepub.com/home/inq


Sanela Pivač, PhD, MSc (Nursing), RN¹ , Primož Gradišek, PhD^{2,3}, and Brigita Skela-Savič, PhD, MPhil, BA, RN¹

Abstract

The purpose of our research was to identify the experiences, obstacles, and self-reflective opinions regarding the qualifications of the training providers of cardiopulmonary resuscitation to third-cycle primary school students. The effectiveness and success of a training program in basic resuscitation procedures depend on the qualifications and knowledge of the training provider and the type of didactic materials used. The qualitative method was used with 3 non-homogenous focus groups. Training providers (n=8) from primary health care participated. The selected text was analyzed using a thematic analysis. The focus groups were organized after the training conducted on basic resuscitation procedures to third-cycle primary school students in September and October 2018. Prior to conducting the research we gained approval by the Medical Ethics Committee. Twenty-five codes, 11 categories and 3 themes were designed: Obstacles that are present in conducting training on cardiopulmonary resuscitation, the effects of training on primary school students and the development of components of prosocial behavior, and systemic responsibility for the qualifications and knowledge of training providers. The research has found that training providers must have the skills and knowledge to motivate the participants of training sessions and encourage them to gain knowledge and skills on resuscitation. They should be familiar with various methods and forms of learning and use relevant teaching materials, so that they can conduct training sessions effectively. Activities are needed to implement minimal criteria for conducting training on resuscitation such as appropriately qualified providers that should follow the European Resuscitation Guidelines, an appropriate pedagogical approach employed by the providers, appropriate equipment and tools, content adjusted to the age of the primary school students, conducting training in small groups, revision of knowledge for training providers and primary school students.

Keywords

training, knowledge, materials, equipment

What do we already know about this topic?

The survival rate of a person in OHCA depends on the ability of a person who is the first to help by performing CPR, so it is important that everyone can identify a person who is in cardiac arrest and begins to perform CPR.

How does your research contribute to the field?

The purpose of our research was to establish the experiences, obstacles and self-reflexion regarding the competence of providers of training in the field of nursing on basic resuscitation procedures for third-cycle primary school students and propose minimal criteria for the implementation of training regarding the basic resuscitation procedures for students.

What are your research's implications toward theory, practice, or policy?

By providing health education, providing equipment and aids for resuscitation learning, we are helping to improve the health status of out-of-hospital cardiac arrest, which is a major public health concern.

Introduction

Out-of-hospital cardiac arrest (OHCA) is the main cause of death around the world. Over 700 000 people die from OHCA in Europe and the United States every year.¹

Immediate resuscitation may increase the chances of survival following OHCA twofold or even fourfold.² According to the most recent data, in Slovenia 30% of eyewitnesses start resuscitating with cardiopulmonary resuscitation



(CPR), which places Slovenia in the bottom third of European countries.¹ OHCA can be identified by unresponsiveness and absence of breathing.³ Due to high death rates, and high morbidity and disability rates of the survivors, it is a serious public health issue.⁴ Learning about CPR should already be included in primary schools since children are better motivated and learn faster and better than adults. In some countries CPR training is compulsory for primary school students, while in others it is gradually being introduced in the compulsory curricula.⁵ In Europe, CPR training in primary schools is regulated in 6 states.⁶ Norway is the first country to have included elective subjects on resuscitation in the school curricula since 1961,⁷ followed by other countries: Belgium, Denmark, France, Italy, Portugal, and England,⁸ while other European countries have been considering it.

Early resuscitation is crucial to a person's survival in cardiac arrest, which is why many countries are working to increase the proportion of the lay population performing CPR and using an automated external defibrillator (AED).⁹ Research shows that the training on how to perform CPR by using an AED may be conducted by many people: doctors, nurses, students of medicine and health sciences, previously trained teachers and other qualified volunteers.^{5,10-12} The effectiveness and success of the education program depend on the qualifications and knowledge of the person who is providing the training on performing CPR using an AED¹¹ and on the type of teaching materials that the training providers use (lectures, practical demonstrations, learning via video, social networks).¹⁰ The authors^{12,13} have found that there are no major differences in the knowledge of the training participants with regard to who has conducted the training, whether they are health care workers or teachers who have been trained how to perform CPR using an AED. It is important that the providers are appropriately qualified and follow the guidelines of the European Resuscitation Council. OHCA resuscitation measures and procedures are adopted by the European Resuscitation Council every 5 years.¹⁴ Previously trained teachers can be suitable providers of CPR training in schools and may be as effective in conducting training as other health care experts.^{11,12}

Boudreaux and Broussard¹⁵ state that nurses and school staff should be prepared to provide support to individuals of various age groups during life-threatening in-school emergencies. Ideally, a registered nurse would be present in all schools offering an AED program. However, in several

schools there are no school nurses present in school every day. School nurses are often the only healthcare professionals present in a school, and they may serve as educators, coordinators, or policy advocates for AEDs.

In any case, being aware that all providers of training, including health care trainers, should undergo training in order to achieve the desired results in training, is important.¹⁶

The purpose of our research was to identify the experiences, obstacles and self-reflective opinions regarding the competence of CPR training providers in the field of nursing for third-cycle primary school students.

Methods

The qualitative method of the focus group was used. Text analysis and thematic qualitative analysis were used to analyze the data.

Sample

Twelve individuals were invited to join the focus groups and 8 providers and designers of training programs who are employed in nursing or primary health care participated. All participants had previous experience of delivering CPR training in primary schools. Six women and 2 men participated. Four of them are certified instructors for CPR and AED. The average age of the participants was 43 years (SD=9.3), the average employment period was 21.4 years (SD=12.8). In terms of qualifications, there was 1 participant with a master's degree, 6 were registered nurses and 1 was a nurse assistant working as a paramedic.

Instrument

Seven semi-structured questions that were updated during the discussion were used in the focus groups. We asked open questions which enabled participants to give different answers and more information:

1. What is your opinion on the qualifications of the resuscitation training providers?
2. In your opinion, who are the competent providers of resuscitation training?
3. What knowledge should training providers have?
4. What are the minimal standards that training providers should consider and have?

¹Angela Boškin Faculty of Health Care, Jesenice, Slovenia

²University Medical Center Ljubljana, Ljubljana, Slovenia

³University of Ljubljana, Ljubljana, Slovenia

Received 24 April 2022; revised 18 August 2022; revised manuscript accepted 30 August 2022

Corresponding Author:

Sanela Pivač, Angela Boškin Faculty of Health Care, Slovenia, Spodnji Plavž 3, Jesenice, SI-4270, Slovenia.

Email: spivac@fzab.si

5. What are your experiences with the organization of training?
6. In your opinion, what are the obstacles that you as a training provider deal with?
7. How do these kind of training sessions affect primary school students and the society at large?

The questionnaire with semi-structured questions for the focus groups was submitted together with the full application to the Medical Ethics Committee.

The reliability and validity of the research was ensured by following the methodological principles of the selected method: the relevance of the number of focus groups ($n=3$), the number of participants in a group (focus group 1=3 participants, focus group 2=3 participants, focus group 3=2 participants), which ensured that data saturation was achieved with the third focus group, despite the small sample size within the third focus group, with only 2 out of 4 participants responding to the agreed date for the third focus group. In managing each focus group, we considered group dynamics and ensured equal inclusion in the discussion. To ensure reliability, we digitally recorded the conversations in the group interview. Then, we transcribed the recording and made sure that the transcription was in line with the audio recording. With an aim of increasing data analysis validity, 2 researchers analyzed the data, ensuring that the codes were unified. An independent analysis conducted by 2 researchers lowers the possibility of partiality and increases the research interpretative basis. Thematic analysis was used to demonstrate that the analysis of data was conducted precisely, consistently, and in an exhaustive manner by means of recording, systematizing, and disclosing the methods of analysis providing a sufficient amount of detail.¹⁷ In addition, traditional tools of colored pens, paper, and sticky notes to ensure rigor were used.¹⁸

Data Collection

The focus groups were organized after the training on CPR offered to third-cycle primary school students was conducted in September and October 2018. The trainings on CPR were carried out in those primary schools that already had a planned resuscitation training in the period from the beginning of April to the end of May 2018. The focus group was led by a moderator who knew the area of research. All the selected research participants were sent an invitation to participate, containing a short description of the purpose of the research and the basic research questions. The average duration of a focus group session was 60 min.

Data Analysis

To obtain qualitative data, the thematic content analysis method was used. The authors state that a thematic analysis is a widely used qualitative analytical method that offers an accessible and theoretically adjustable approach to the

analysis of qualitative data.¹⁹ Upon a written consent by the participants, they were audio-recorded. All audio recordings were transcribed and the transcriptions were then read several times. Coding units were set, coding was performed and categories and key topics were determined. Every focus group was coded. Coding enabled that the name identity of the individual transcription was concealed, but the traceability of the content was still possible. The data were analyzed by 2 researchers who also ensured that the codes were unified in order to increase the reliability of the analysis.

Ethical Approval

Permission to conduct and implement the research was obtained from the Medical Ethics Committee on 28 June 2017 (letter number 0120-269/2017-4). The qualitative research was part of the research conducted as part of the doctoral dissertation by the first author titled. Letters of consent were obtained from participating community health centers. Anonymity of research participants was ensured.

Results

Based on the text analysis we formed 25 codes, developed 11 overarching categories and 3 final topics: (1) Obstacles that are present in conducting CPR training, (2) The effects of training on primary school students and the development of components of pro-social behaviors, and (3) Systemic responsibility for the qualifications and knowledge of training providers (Table 1).

In the article, topics and randomly selected quotations are presented.

1. Obstacles that are present in conducting CPR training

Participants of focus groups believe that there are obstacles in conducting CPR training. The training providers must have suitable equipment and tools, which are not available everywhere, although they represent a minimum standard for conducting CPR training.

"I go to the faculty to borrow the doll." (F1/U1)

"A defibrillator for training is a must-have, if there is none, you can't simulate and the work is only half-done." (F1/U2)

"Unfortunately, we don't have equipment like the CPR doll and AED trainer at the community health centre. We have submitted the orders, but unfortunately, they were rejected. We borrow these dolls from the simulation centre, if we conduct these workshops as a part of a project, we borrow from each other." (F2/U3)

"The doll, the school defibrillator; small dolls they got for me so that the children could try. If you don't have the equipment, it is absolutely ineffective." (F3/U1)

Table 1. Categories and Topics of Focus Groups.

Categories	Number of codes	Topics
Providing learning materials and tools	1	Obstacles that are present in conducting CPR training
Various teaching approaches and skills	5	
Development of social relations and moral responsibility	3	The effects of training on primary school students and the development of components of pro-social behavior
Increased self-confidence leads to primary school students offering help	2	
Internal values	2	Systemic responsibility for the qualifications and knowledge of training providers
Ability to remember	2	
Development of positive emotions	1	
Early training	1	

The results have shown that the providers' qualifications, which should follow the European Resuscitation Council guidelines, a suitable teaching approach of the providers and key content included in CPR training, should be defined. The organizational aspect is also significant.

"After practice in the field, what I see is that not all training providers are qualified appropriately. I prepare for the workshops so that I prepare the scenarios which would gain the children's attention." (F1/U2)

"The provider must be someone who follows the resuscitation guidelines because I noticed that some providers still teach the old way and don't follow the guidelines. Sometimes I also prepare a video." (F2/U3)

"I think that the training provider should follow the new guidelines, update their knowledge with their colleagues who also train and share experience of good practices." (F2/U2)

"It does not have to be a registered nurse, but it is important that the training provider has enough experience in emergency medical assistance, but I would suggest that providers strengthen their knowledge in simulation centres by means of various scenarios." (F2/U3)

"The teaching approach is necessary. You pick it up in time. I think that you need to have some feeling for it, too." (F1/U1)

"Pedagogical and andragogical knowledge is very important. I individually adjust to groups and age by using different approaches – scenarios, I have discussions with them, I put them in subgroups." (F3/U1)

"... it is definitely easier and of higher quality if you have a small group. A maximum is 10 per workshop for me to say, that is quality teaching." (F1/U2)

2. The effects of training on primary school students and the development of components of pro-social behavior

In their statements, the participants of focus groups often say that education alone strengthens the pro-social behavior of

primary school students. The awareness of the responsibility to help others develops in a positive way and self-confidence also strengthens. They emphasize uniformly that early training for primary school students strengthens a socially important concept of helping those in distress.

"I have found that they are responsible as they emphasize during training how important it is to help the people who need it." (F2/U1)

"... the first thing that is important is to help a fellow human being, to encourage one another to be a little bit more attentive and help a person that is in need, to know how to help them, not to be afraid." (F3/U1)

They have noticed that CPR training had a positive effect on the development of emotions and a decrease in fear.

"Experiences have shown that they know the approach, the way, and try and see that it is not such a taboo, that the machine can be used without damage, that they don't think that, 'Oh now I will cause I don't know what kind of damage if I touch it,' and if they have the knowledge, then they also make decisions easily. Also, compassion for a fellow human being definitely changes." (F3/U1)

"They should be informed about the AED at school, where it can be found, it is a must. I ask them if they know where the AED is stored. They can go and check it out with their class teacher; the results of the research have also shown that they are not very well informed about what an AED is." (F1/U1)

"The kids are not as scared after they have tested the defibrillator. . ." (F2/U2)

3. Systemic responsibility for the qualifications and knowledge of training providers

They see an improvement in the systemic responsibility of education and professional associations, especially in establishing an umbrella organization that would contribute toward providing suitable instructions and regular training for training providers and an appropriate education approach toward the children.

"The basis are the guidelines on resuscitation, they are like a frame for providers." (F2/U1)

"Training should be compulsory for primary school students." (F3/U1)

"...It happens that there are discrepancies between providers, we teach according to these guidelines, but some others don't. That's why it's like you said before, a centre, an umbrella organization is needed, which would ensure that these people are trained to teach according to the same guidelines." (F3/U1)

Discussion

Based on the conducted research, we have identified the obstacles faced by providers of CPR training for primary school children, the effects of the training on the pro-social behavior of primary school children and proposals for a systemic arrangement for the qualifications and knowledge of the training providers.

Obstacles that are Present in Conducting CPR Training

The members of focus groups outlined the obstacles that they encounter in their work. An important obstacle that they emphasized was insufficient equipment and the tools for conducting the training of CPR using an AED as some trainers do not have the appropriate equipment and tools for conducting CPR training and have to obtain them in different ways from other organizations. It is important to be aware that if we wish to implement effective training of CPR using an AED, equipment and other teaching tools are some of the main components of training, since without a simulation doll for teaching resuscitation or an AED, it is not possible to conduct training in a quality and effective manner.

For effective training of CPR using an AED, it is necessary to test different ways of training on a national level.²⁰ For training on CPR using an AED, different teaching methods and approaches can be applied.²¹ In some countries, videos are used as a learning tool for independent learning.^{21,22}

We believe that for effective knowledge transfer and the spread of knowledge on CPR using an AED, it is necessary that the trainers know and use various innovative teaching approaches and present students with theoretical and practical knowledge. There should be more of the latter and it should be adjusted to the age of non-professionals attendees.

The Effects of Training on Primary School Students and the Development of Components of Pro-Social Behavior

The analysis of results of the focus groups has demonstrated that early training of primary school students promotes the

responsibility to help a fellow human being. Also, pro-social behavior of primary school students strengthens. Such training sessions are important also because they develop self-confidence in primary school students.²³ The motivation of an individual to start with resuscitation is to a great extent dependent on the level of self-confidence, which points to the fact that developing the self-confidence of primary school students by providers of training of CPR using an AED is very important.²⁴ Developing the self-confidence of primary school students is related to an appropriately selected teaching method and the students' age. The method of teaching of CPR using an AED by showing practical images, playing music and teaching smaller groups of primary school students can have an effect on improving the self-confidence of primary school students.²⁵ CPR education in schoolchildren successfully increases their CPR knowledge and skills, and strengthens their self-confidence in helping OHCA patients.²⁶

Systemic Responsibility for the Qualifications and Knowledge of Training Providers

The research participants believe that training providers have different qualifications, which means that the minimum criteria for providers of CPR training to school children should be set. They propose an inclusion of compulsory CPR training in the school curricula and believe that training providers should follow the guidelines of the European Resuscitation Council on CPR,¹⁴ they should know various teaching approaches, they should have equipment and tools available to conduct practical training and to conduct training more effectively, and that training should be organized in small groups.

The participants of focus groups can recognize the importance of establishing an umbrella organization that would take care of informing the training providers on new guidelines of the European Resuscitation Council and enable regular training on CPR for the training providers and thus establish a more active cooperation with schools. We believe that education decision-makers at the Ministry of Education have an important role of including resuscitation in the compulsory part of the primary school curricula. Other authors also state that the onus is on the Ministry of Education and other decision-makers in education to implement a national program on introducing resuscitation in the school curriculum and use it to teach primary school students about CPT in every country.²⁷ Previous training of resuscitation training providers is the basic condition needed so that training providers can effectively and independently transfer knowledge on CPT with an AED on younger generations. In addition to previous preparation for conducting training sessions, the research participants believe that training providers should know various educational approaches for the implementation of such training since the effectiveness of CPT training with the use of an AED also depends on the qualifications of

training providers. Previous training on CPT with the use of an AED is important for all training providers, health care workers, students of medicine and health care,²⁸ and school teachers.⁸ The authors have found that effective providers of CPT training with the use of an AED can also be teachers at schools since they hold a special position in the field of education within the broad public. They are also more included in social environments where the probability of OHCA cases is greater and where they are expected to know how to act,^{8,29} so it is important that they obtain professional knowledge in CPR, so that they are competent trainers of CPR with the use of an AED. Teachers can easily be educated to become competent in CPR and AED instructors for their schoolchildren within 4h by using specially developed CPR instructor courses.³⁰ Some study shows that schoolteachers demonstrated a lack of knowledge in the identification of cardiac arrest and in CPR, so they need additional support. The training of schoolteachers in CPR might be the foundation for the sustainable transfer of CPR-related knowledge to school children.³¹ The responsible people in the Ministries of Education and/or Ministries of Schools and other leading politicians of each country should implement a nationwide program for educating the schoolteachers to become fully competent in CPR and, thus—with their help—to educate schoolchildren in CPR.¹⁵ It is necessary to previously train the teaching staff by including these contents in school curricula.³²

In the research we have found that education providers approach the implementation of training in different ways with some preparing scenarios and videos in advance, while others adjust to groups and age, and discuss the use of an AED as they believe that in this way, primary school students will better understand the CPR approaches with the use of an AED. In addition to theoretical lectures and practical classes, some authors emphasize that learning in real circumstances is also important²⁸ as well as teaching with videos, which allows for a learning-centered approach, improves the ability of learning and makes understanding easier for students.³³

The findings of this research provide us with opportunities to make improvements that can have a significant impact on decision makers and school program co-designers on the systemic design of CPR education by providing the appropriate equipment and facilities to achieve the desired educational outcomes. The research suggests that similar barriers and challenges are also faced by school nurses delivering this type of education in schools.¹⁵ The provision of CPR training by school nurses can be an opportunity to showcase the nursing profession and ensure that the school nurse continues to have a presence in schools.³⁴

The findings of the study are also related to the positive impact of the CPR education delivered and the prosocial behavior of primary school children. In fact, it is necessary to start the education as early as possible, as young people are very receptive to innovations and responsibilities where it is necessary to show courageous action.

Limitations of the Research

The sample of the third focus group is small since only 2 out of 4 participants responded to the scheduled meeting. Two participants canceled their participation shortly before the start of the third focus group, but we decided to conduct the focus group and analyze the data nevertheless. The third focus group was not canceled due to ethical principles; it was implemented and in-depth conclusions were made. Despite the third focus group being smaller, data saturation was achieved which means that no new information was expected. Therefore, we decided to conclude the research with the third focus group.

We did not clarify any power calculation for the estimation of sample size, instead we followed data saturation.

Conclusion

The research has pointed to the fact that trainers should have knowledge of CPR using an AED, follow the guidelines of the European Resuscitation Council and be familiar with different teaching approaches of conducting training with regard to the students that they are teaching. The programs that train non-professionals may save more lives, improve the productivity of the society and lower the costs of health care. In order to set up a compulsory systemic training of resuscitation, equipment and other tools are essential, as without a simulation doll for teaching resuscitation or without an AED, it is not possible to conduct training in a high quality and effective manner. Therefore, despite the limitations in the research, we propose improvements that would enable providers of CPR training to conduct training in a more effective manner and reduce the obstacles that they encounter whilst conducting training. To conduct training of CPR with an AED, minimum criteria should be implemented and an umbrella organization should be set up as it could control the qualifications of training providers and secure the materials that would be available to all providers. Also, there could be a common online platform that would enable trainers to share their experiences and propose innovative approaches and methods to apply in the teaching of primary school students. The role, as well as relevant knowledge of trainers of CPR with an AED, is, therefore, invaluable. It is also important that providers of resuscitation training that do not have prior qualifications in health care are involved in such an organization, since they should be familiar with the recommendations and guidelines regarding CPR and update their knowledge regularly.

Acknowledgments

We would like to thank all the providers of training, community health centers, primary school students, and their parents that gave their consent to participate in the research.

The authors would like to thank all CPR instructors, health education centers, the schoolchildren who participated in the research, the

elementary schools that agreed for the research to be conducted and the parents who allowed their children to participate in the research.

Authors' Contributions

All authors were involved in preparing the article, they all gave final approval of the version to be published and they all agree to be accountable for all aspects of the work.

- Introduction and literature review: SP, BSS, PG
- Methods: SP, BSS
- Data analysis: SP
- Discussion and Conclusion: SP, BSS, PG

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Ethical Approval

Permission to conduct and implement the research was obtained from the Slovenian National Medical Ethics Committee on June 28, 2017 (0120-269/2017-4; KME 41/05/17). Letters of consent were obtained from participating schools and community health centers, as well as from the parents of child respondents. Anonymity of research participants was ensured.

ORCID iD

Sanela Pivač  <https://orcid.org/0000-0003-2372-9497>

Supplemental Material

Supplemental material for this article is available online.

References

1. Gräsner JT, Lefering R, Koster RW, et al. EuReCa ONE-27 nations, ONE Europe, ONE registry: a prospective one month analysis of out-of-hospital cardiac arrest outcomes in 27 countries in Europe. *Resuscitation*. 2016;105:188-195. doi:10.1016/j.resuscitation.2016.06.004
2. Kragholm K, Wissenberg M, Mortensen RN, et al. Bystander efforts and 1-year outcomes in out-of-hospital cardiac arrest. *N Engl J Med*. 2017;376(18):1737-1747. doi:10.1056/NEJMoa1601891
3. Hulleman M, Berdowski J, de Groot JR, et al. Implantable cardioverter-defibrillators have reduced the incidence of resuscitation for out-of-hospital cardiac arrest caused by lethal arrhythmias. *Circulation*. 2012;126:815-821. doi:10.1161/CIRCULATIONAHA.111.089425
4. Sasson C, Meischke H, Abella BS, et al. Increasing cardiopulmonary resuscitation provision in communities with low bystander cardiopulmonary resuscitation rates: a science advisory from the American Heart Association for Healthcare Providers, policymakers, public health departments, and community leaders. *Circulation*. 2013;127:1342-1350. doi:10.1161/CIR.0b013e318288b4dd
5. Böttiger BW. "A Time to Act"—Anaesthesiologists in resuscitation help save 200,000 lives per year worldwide: school children, lay resuscitation, telephone-CPR, IOM and more. *Eur J Anaesthesiol*. 2015;32:825-827. doi:10.1097/EJA.0000000000000374
6. Semeraro F, Wingen S, Schroeder DC, et al. Kids save lives—three years of implementation in Europe. *Resuscitation*. 2018;131:e9-e11. doi:10.1016/j.resuscitation.2018.08.008
7. Lind B, Stovner J. Mouth-to-Mouth resuscitation in Norway. *JAMA*. 1963;185:933-935. doi:10.1001/jama.1963.03060120043019
8. Mpotos N, Vekeman E, Monsieurs K, Derese A, Valcke M. Knowledge and willingness to teach cardiopulmonary resuscitation: a survey amongst 4273 teachers. *Resuscitation*. 2013;84:496-500. doi:10.1016/j.resuscitation.2013.01.023
9. Sondergaard KB, Wissenberg M, Gerds TA, et al. Bystander cardiopulmonary resuscitation and long-term outcomes in out-of-hospital cardiac arrest according to location of arrest. *Eur Heart J*. 2019;40:309-318. doi:10.1093/eurheartj/ehy687
10. Plant N, Taylor K. How best to teach CPR to schoolchildren: a systematic review. *Resuscitation*. 2013;84:415-421. doi:10.1016/j.resuscitation.2012.12.008
11. Bohn A, Van Aken HK, Möllhoff T, et al. Teaching resuscitation in schools: annual tuition by trained teachers is effective starting at age 10. A four-year prospective cohort study. *Resuscitation*. 2012;83:619-625. doi:10.1016/j.resuscitation.2012.01.020
12. Lukas RP, Van Aken H, Möllhoff T, et al. Kids save lives: a six-year longitudinal study of schoolchildren learning cardiopulmonary resuscitation: who should do the teaching and will the effects last? *Resuscitation*. 2016;101:35-40. doi:10.1016/j.resuscitation.2016.01.028
13. Bohn A, Lukas RP, Breckwoldt J, Böttiger BW, Van Aken H. 'Kids save lives': why school children should train in cardiopulmonary resuscitation. *Curr Opin Crit Care*. 2015;21:220-225. doi:10.1097/MCC.0000000000000204
14. Monsieurs KG, Nolan JP, Bossaert LL, et al. European Resuscitation Council guidelines for resuscitation 2015 Section 1. Executive summary. *Resuscitation*. 2015;95:1-80. doi:10.1016/j.resuscitation.2015.07.038
15. Boudreaux S, Broussard L. Sudden cardiac arrest in schools: the role of the school nurse in AED program implementation. *Issues Compr Pediatr Nurs*. 2012;35:143-152. doi:10.3109/01460862.2012.708214
16. Gradišek P, Grošelj Grenc M, Strdin Košir A. Smernice zaoživljanje 2015 Evropskega reanimacijskega sveta: slovenska izdaja. Updated 2015. Accessed February 1, 2022. http://www.szum.si/media/uploads/files/ERC_2015_slo-1.pdf
17. Nowell LS, Norris JM, White DE, Moules NJ. Thematic analysis: striving to meet the trustworthiness criteria. *Int J Qual Methods*. 2017;16(1):1-13. doi:10.1177/1609406917733847
18. Maher C, Hadfield M, Hutchings M, de Eyto A. Ensuring rigor in qualitative data analysis: a design research approach to coding combining NVivo with traditional material methods. *Int J Qual Methods*. 2018;17(1):1-13. doi:10.1177/1609406918786362
19. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3(2):77-101.
20. Rajapakse R, Noč M, Kersnik J. Public knowledge of cardiopulmonary resuscitation in Republic of Slovenia. *Wien Klin*

- Wochenschr.* 2010;122:667-672. doi:10.1007/s00508-010-1489-8
21. Einspruch EL, Lynch B, Aufderheide TP, Nichol G, Becker L. Retention of CPR skills learned in a traditional AHA heart saver course versus 30-min video self-training: a controlled randomized study. *Resuscitation.* 2007;74:476-486. doi:10.1016/j.resuscitation.2007.01.030
 22. Isbye DL, Rasmussen LS, Lippert FK, Rudolph SF, Ringsted CV. Laypersons may learn basic life support in 24min using a personal resuscitation manikin. *Resuscitation.* 2006;69:435-442. doi:10.1016/j.resuscitation.2005.10.027
 23. Lu C, Jin YH, Shi XT, et al. Factors influencing Chinese university students' willingness to performing bystander cardiopulmonary resuscitation. *Int Emerg Nurs.* 2017;32:3-8. doi:10.1016/j.ienj.2016.04.001
 24. Kanstad BK, Nilsen SA, Fredriksen K. CPR knowledge and attitude to performing bystander CPR among secondary school students in Norway. *Resuscitation.* 2011;82:1053-1059. doi:10.1016/j.resuscitation.2011.03.033
 25. Ettl F, Testori C, Weiser C, et al. Updated teaching techniques improve CPR performance measures: a cluster randomized, controlled trial. *Resuscitation.* 2011;82:730-735. doi:10.1016/j.resuscitation.2011.02.005
 26. Wingen S, Schroeder DC, Ecker H, et al. Self-confidence and level of knowledge after cardiopulmonary resuscitation training in 14 to 18-year-old schoolchildren: a randomised-interventional controlled study in secondary schools in Germany. *Eur J Anaesthesiol.* 2018;35(7):519-526. doi:10.1097/EJA.0000000000000766
 27. Wissenberg M, Lippert FK, Folke F, et al. Association of national initiatives to improve cardiac arrest management with rates of bystander intervention and patient survival after out-of-hospital cardiac arrest. *JAMA.* 2013;310:1377-1384. doi:10.1001/jama.2013.278483
 28. Matchim Y, Kongsuwan W. Thai nursing students' experiences when attending real life situations involving cardiac life support: a phenomenological study. *Nurse Educ Today.* 2015;35(12):1186-1191. doi:10.1016/j.nedt.2015.05.010
 29. Colquhoun M. Learning CPR at school – everyone should do it. *Resuscitation.* 2012;83(5):543-544. doi:10.1016/j.resuscitation.2012.03.004
 30. Dirks B, Wingen S, Rücker G, Greif R, Papaspyrou H, Böttiger BW. Modularer Lehrerausbildungskurs des Deutschen Rates für Wiederbelebung (GRC) für den Wiederbelebungunterricht in Schulen–Positionspapier des GRC nach der Empfehlung der Deutschen Kultusministerkonferenz und dem aktuellen GRC-Mustercurriculum. *Notf Rett Med.* 2019;22:334-338. doi:10.1007/s10049-019-0609-x
 31. Abelairas-Gómez C, Schroeder DC, Carballo-Fazanes A, et al. KIDS SAVE LIVES in schools: cross-sectional survey of schoolteachers. *Eur J Pediatr.* 2021;180:2213-2221. doi:10.1007/s00431-021-03971-x
 32. Abelairas-Gómez C, Carballo-Fazanes A, Martínez-Isasi S, López-García S, Rico-Díaz J, Rodríguez-Núñez A. Knowledge and attitudes on first aid and basic life support of pre- and elementary school teachers and parents. *An Pediatr (Engl Ed).* 2020;92(5):268-276. doi:10.1016/j.anpede.2019.10.005
 33. Devi WR. Effectiveness of video assisted teaching on CPR (Cardiopulmonary resuscitation) for children among student nurses. *Int J Nurs Educ.* 2017;9(3):37-42. doi:10.5958/0974-9357.2017.00068.X
 34. Nordheim S. Hands-Only cardiopulmonary resuscitation training in schools: impact of legislation on the future of School Nurses. *J Sch Health.* 2019;89(10):860-862. doi:10.1111/josh.12819