



International Journal of Current Research and Academic Review

ISSN: 2347-3215 (Online) Volume 6 Number 6 (June-2018)

Journal homepage: <http://www.ijcrar.com>



doi: <https://doi.org/10.20546/ijcrar.2018.606.001>

Education Level Do Not Affect the Knowledge of Cardiopulmonary Resuscitation of Physical Education Teachers

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Abstract

Physical education teachers are invited on a daily basis by teachers from other school specialties to give first aid to a variety of emergency and non-emergency situations during the school year. They must therefore assess the situation of the pupils and whether it is serious to call for medical assistance, to accurately recognize their problem, to give them proper immediate help, to arrange for their transfer to their home, to a doctor or to a hospital, to stay together until they come to ambulance or specialist help and finally help if they need it. A thorough review of the literature did not identify a study that explored the knowledge of physical education teachers in cardiopulmonary resuscitation at elementary schools with the European Resuscitation Council scale and this study was conducted to fill this existing research gap. Thus, the purpose of this study was to identify the knowledge in cardiopulmonary resuscitation of physical education teachers working in elementary schools of eastern Attica. For the purposes of the survey, the scale of the European Resuscitation Council, which consisted of 18 items relating to the cardiopulmonary resuscitation procedures, was used. Physical education teachers were tested on the proposals for knowledge in cardiopulmonary resuscitation "right, wrong, do not know". Then the χ^2 test was used to compare the education level of physical education teachers and the level of cardiopulmonary resuscitation knowledge. The analysis of data showed that physical education teachers were not well aware of the process of cardiopulmonary resuscitation. However, the education level did not affect their knowledge cardiopulmonary resuscitation maneuvers, since only three from eighteen items were significant. It is concluded that physical education teachers should training in order to perform satisfactory cardiopulmonary resuscitation.

Article Info

Accepted: 25 May 2018

Available Online: 20 June 2018

Keywords

Cardiopulmonary resuscitation, Education level, First aid, Physical education teachers, Elementary schools.

Introduction

First aid is the immediate action taken to help a person in danger, before the ambulance, doctor or other specialists (Baltopoulos, 2001; Stergioulas, 2012). The goals of first aid are: a) to keep the suffering person alive. (b) To help it recover and (c) To reduce the consequences of an

injury or illness (AMA handbook of first aid and medical care, 2009, Emergency first response, 2010, Stergioulas, 2005). Physical Education Teachers (PET) in accordance with the timetable of the Ministry of Education, are the educational specialty that teaches the subject of physical education and sport at all levels of education.

This teacher performs his or her duties in the sports facilities of the school, which may be the yard, the gym or similar multi-purpose rooms. They also performs his / her duties at the various championships between schools, either by accompanying the school pupils of the various teams, such as football, basketball, handball or even classical sports (Stergioulas, and Mandilas, 2003; Stergioulas, Avgerinou and Sgaras, 2003).

Therefore, the PET is invited on a daily basis by the teachers of the other departments of the school to give first aid to a variety of emergency and non-emergency situations during the school year, which lasts from September to June of the next year (Stergioulas, and Mandilas, 2003; Stergioulas, Avgerinou and Sgaras, 2003). So, he/she must assess the condition of the student and if it is serious to call for medical assistance, to accurately recognize his/her problem, to give proper direct help, to arrange for the student to be transferred to his/her home, doctor or hospital, (Gray, 1995; Thygerson and Thygerson, 2011).

Physical education teachers are present in most of the student's motor activities and are inevitably the first to deal with an emergency situation in which a pupil's life may be directly threatened. Thus, he/she must be able to assess the pupil's condition, ensure the safety of the area, give proper first aid and call for help if he/she does not observe breathing and movement. He/she still has to check his feelings and give himself time to think, not to expose himself to risk using simple logic, without trying to do it all alone (Emergency First Response, 2010).

But to be successful, physical education teachers must be certified in first aid. If they are not, they may hesitate to give emergency care to a student because of anxiety, guilt, fear of inadequate performance, the likelihood of deterioration of his condition, responsibility and fear of infection (Flegel, 1992; Gray, 1995; First aid for babies and children, 2006).

More, certified physical education teachers inspire safety and trust. They do not panic with the problem as teachers of other specialties, act calmly and speak with determination and steady moves. Also, with the knowledge they have gained after the certification examination, they can inspire confidence, because they continue to talk to the student and keep his hand, explain what he/she needs to do, answer the questions he/she is, and encourage him / her continuity Athletic training and Sport Medicine, 1999; Stergioulas, 2006).

Several studies have been published in the literature that assessed the basic level of first aid workers' knowledge in various workplaces. Yurumez and others (2007), in a study conducted by primary school teachers at Afinon Karachihas, showed that although the teachers involved in the study had sufficient knowledge of first aid issues, they themselves showed their interest for further education.

In a study by Li et al (2012), staff knowledge in early childhood care was evaluated. A multiple choice questionnaire was used to collect the data, which filled 1067 people. None of the respondents responded correctly to all the questions. Only 39 people (3.7%) achieved a high score.

The relative number of correct answers to specific questions ranged from 16.5% to 90.2%. In particular, individuals were unaware of first aid for seizures (only 16.5% responded correctly), chemical injuries to the eye (23%), inhaled poisons (27.6%), drowning and coughing (30, 1%). Multiple linear regression analysis showed that first aid knowledge was significantly higher among staff with more education, those who had been trained in first aid before or were already in healthcare providers, younger workers, and staff members rural areas. Most employees agreed that first aid was helpful, and the vast majority felt that it was important and useful for them to learn first aid for infants and toddlers.

In another survey conducted in teachers of five elementary schools in Iraq, it was found that teachers had insufficient knowledge of first aid. In addition, there was no difference in knowledge among teachers with fewer or more years of service ((Tameem and Khudair, 2016).

Alexandroupoulou (2013), in a review conducted on the evaluation of health education programs, concluded that research data suggesting that health education activities at school are effective and that the school can therefore be a health education body.

Also, in a review conducted by Alexandroupoulou (2013) on the evaluation of a first aid program for staff working in special education schools, the results have shown that such programs are important because they enhance knowledge and contribute to the development of staff skills. However, they should be implemented by professionals who have experience and knowledge on the subject.

Scapigliati et al (2013) investigated the type of cardiopulmonary resuscitation training in 32 Italian Universities. Course presidents, teaching secretary or deans participated in the study. The results showed that only a small number of the Universities offered courses of cardiopulmonary resuscitation. Authors concluded shows a limitation in the generation of training subjects with specialize in CPR.

Stergioulas (2006), in the context of his study of cardiopulmonary resuscitation showed that the participants expressed the need for their further education on issues with this content, as these teachers in their everyday life are called upon to face situations threatening to human life.

The literature review has shown that in recent years several serious injuries have occurred in schools, while physical education teachers have been faced with many emergencies.

The review also identifies the need for continuous information and continuing education to be able to address the emergency situations more positively. It was also found that investigations with management of first aid seminars with training intervention are missing. This study will cover an important area, since at all levels of PET are first aiders either because they are present on the scene of the injury or because they are called by other colleagues who do not have the knowledge to act.

The literature review revealed no study to investigate the level of cardiopulmonary resuscitation of Greek physical education teachers employment in the east Attica region. Therefore the aim of the present study was to determine the level of knowledge in the cardiopulmonary resuscitation of physical education teachers.

Materials and Methods

Sample

In the present study, 200 physical education teachers attending elementary schools at East Attika region took part by random selection. For the present study a questionnaire developed. Main items of the scale were contents of the European Resuscitation Council analogous questionnaire and of consisted 18 items relating to the cardiopulmonary resuscitation. We also added in the instrument information on gender, age, marital status, employment years and hours, position

and education levels. Physical education teachers were tested on the proposals for knowledge in emergency care by marking "right, wrong, do not know".

Statistics

The t-test- retest reliability was used to verify the stability of the scale with respect to the measurements. The Pearson test, showed that the scale had excellent reliability in iterative testing. The χ^2 square test was used to verify if there were significant differences between emergency care knowledge of the responders and education level (Creswell, 2003; Kabitsis, 2004). The level of significance was set at $p < 0.005$.

Results and Discussions

Section A: Characteristics of the sample

A total of 200 subjects participated in and completed this study. Of the sample group, 60 % of the subjects were men and 40 % were women. The majority of physical education teachers were aged between 39-49 years (59 %), were unmarried (70.5%), and most of them had permanent position at the school. One hundred and six of them working 13 to 23 years (53 %), with the main position to be physical education teacher. More detail are presented in Table 1.

Section B: Frequencies of answers and comparison between questionnaire items and education level of participants

Nine of a total of eighteen items were correct while the remaining were wrong. Up to 50% of PET rated as wrong six items, while only one as correct (see table 1).

By analyzing with χ^2 the data we observed statistically significant differences in the following items: (i) «first aid is the assistance given to any person suffering a sudden illness or injury, before the ambulance, doctor, or other specialist» ($\chi^2 = 4.907$, $df = 2$, $p < 0.05$), (ii) the goal in cardiopulmonary resuscitation is to open the child's airways by using the method of tilting the head back and lifting the jaw» ($\chi^2 = 9.05$, $df = 4$, $p < 0.05$) and (iii) «in case of emergency situation, the pulse is checked in the wrist. ($\chi^2 = 13.219$, $df = 2$, $p < 0.05$).

No statistically significant differences were found in the remaining items (table 2).

Table.1 Characteristics of the sample

| Sex | | N | % |
|-------------------------------|----------------------------|----------|----------|
| | Men | 120 | 60.0 |
| | Women | 80 | 40.0 |
| Age | | | % |
| | 28-38 | 11 | 5.5 |
| | 39-49 | 118 | 59.0 |
| | >50 | 71 | 35.5 |
| Family status | | | |
| | Married | 35 | 17.5 |
| | Unmarried | 141 | 70.5 |
| | Divorced | 24 | 12.0 |
| Kind of employment | | | |
| | Permanent | 178 | 89.0 |
| | Substitute | 17 | 8.5 |
| | Hourly wage | 5 | 2.5 |
| Employment years | | | |
| | 2-12 | 69 | 34.5 |
| | 13-23 | 106 | 53.0 |
| | >24 | 25 | 12.5 |
| Daily employment hours | | | |
| | 2-5 | 104 | 52,0 |
| | 6-8 | 52 | 26,0 |
| | >9 | 44 | 22,0 |
| Position | | | |
| | Manager | 3 | 1,5 |
| | Sub-manager | 4 | 2,0 |
| | Physical education teacher | 193 | 96,0 |
| Education level | | | |
| | Physical education degree | 140 | 69,7 |
| | Second degree | 34 | 16,9 |
| | MA/PhD | 26 | 12,9 |

*=Correct

†= Wrong

Table.1A Frequency levels of CPR knowledge of PET

| A/A | ITEM | Correct | Wrong | Don't know |
|-----|---|---------|-------|------------|
| 1* | First aid is the assistance given to any person suffering a sudden illness or injury, before the ambulance, doctor, or other specialist. | 199 | 1 | 0 |
| 2* | First aid substituting medical care in part. | 68 | 127 | |
| 3† | First aid assessment is the treatment of life-threatening situations. | 81 | 108 | 11 |
| 4* | Physical education teacher must stay with the child until someone with similar or better knowledge is brought up or until the 166 arrived. | 16 | 180 | 4 |
| 5† | When giving first aid to children, informed consent is required of their own and their families. | 124 | 44 | 32 |
| 6† | The main function of cardiopulmonary resuscitation is to regain the child's breathing. | 40 | 149 | 11 |
| 7* | The goal in cardiopulmonary resuscitation is to open the child's airways by using the method of tilting the head back and lifting the jaw. | 46 | 145 | 9 |
| 8* | Controlling breathing in a conscious child is by watching, listening and feeling the movement of the air and the chest. | 21 | 162 | 17 |
| 9* | In case of emergency situation, the pulse is checked in the wrist. | 85 | 96 | 19 |
| 10* | In a child at risk, in order to be effective, cardiopulmonary resuscitation should be placed in a supine position. | 26 | 163 | 11 |
| 11† | The basic principle if a child does not have a breath and a pulse is to first call the 166 and then to start a cardiopulmonary resuscitation. | 83 | 114 | 13 |
| 12† | Circulation control is the first action before the initiation of cardiopulmonary resuscitation. | 70 | 98 | 32 |
| 13† | The best indication that chest compressions are effective is the change in the color of the child. | 72 | 78 | 50 |
| 14† | If cardiovascular resuscitation is performed by one person, 5 chest compressions are initiated and followed by an artificial respiration. | 78 | 98 | 24 |
| 15† | Every time a cardiopulmonary resuscitation takes place, the child's heart begins again to bring the child back to life. | 105 | 55 | 40 |
| 16† | When applying chest compressions there is no possibility of complications. | 106 | 60 | 34 |
| 17* | If you can not give rescue breaths to a child who does not breathe, then keep doing chest compressions. These will be beneficial by helping blood circulation and the supply of oxygen. | 23 | 137 | 40 |
| 18* | Rescue breaths can provide oxygen to the child enough to support a child who does not breathe. | 38 | 130 | 32 |

Table.2 Education levels and knowledge of CPR of PET

| A/A | ITEM | χ^2 | <i>p</i> |
|-----|---|----------|----------|
| 1 | First aid is the assistance given to any person suffering a sudden illness or injury, before the ambulance, doctor, or other specialist. | 4.907 | 0.05 |
| 2 | First Aid substituting medical care in part. | 1.720 | NS |
| 3 | First Aid assessment is the treatment of life-threatening situations. | 1.850 | NS |
| 4 | Physical Education Teacher must stay with the child until someone with similar or better knowledge is brought up or until the 166 arrived. | 2.395 | NS |
| 5 | When giving First Aid to children, informed consent is required of their own and their families. | 3.101 | NS |
| 6 | The main function of cardiopulmonary resuscitation is to regain the child's breathing. | 1.395 | NS |
| 7 | The goal in cardiopulmonary resuscitation is to open the child's airways by using the method of tilting the head back and lifting the jaw. | 4.850 | 0.05 |
| 8 | Controlling breathing in a conscious child is by watching, listening and feeling the movement of the air and the chest. | 3.031 | NS |
| 9 | In case of emergency situation, the pulse is checked in the wrist. | 5.219 | 0.04 |
| 10 | In a child at risk, in order to be effective, cardiopulmonary resuscitation should be placed in a supine position. | 1.4 | NS |
| 11 | The basic principle if a child does not have a breath and a pulse is to first call the 166 and then to start a cardiopulmonary resuscitation. | 1.079 | NS |
| 12 | Circulation control is the first action before the initiation of cardiopulmonary resuscitation. | 3.712 | NS |
| 13 | The best indication that chest compressions are effective is the change in the color of the child. | 2.764 | NS |
| 14 | If cardiovascular resuscitation is performed by one person, 5 chest compressions are initiated and followed by an artificial respiration. | 3.429 | NS |
| 15 | Every time a cardiopulmonary resuscitation takes place, the child's heart begins again to bring the child back to life. | 2.807 | NS |
| 16 | When applying chest compressions there is no possibility of complications. | 1.171 | NS |
| 17 | If you can not give rescue breaths to a child who does not breathe, then keep doing chest compressions. These will be beneficial by helping blood circulation and the supply of oxygen. | 2.386 | NS |
| 18 | Rescue breaths can provide oxygen to the child enough to support a child who does not breathe. | 2.995 | NS |

The purpose of this study was to determine the cardiopulmonary resuscitation of physical education teachers working in East Attica schools and to compare the answers between their level of education in CPR.

We found that nine of a total of eighteen items were correct while the remaining were wrong. Up to 50% of PET rated as wrong six items, while only one as correct. When compared the education level and the answers of the subjects in the scale items, we observed statistical differences only in three of total eighteen items.

It is well documented that cardiopulmonary resuscitation knowledge is a significant factor that is associated with a higher percentage of patient survival. Good theoretical knowledge is a prerequisite for PET to give effective and high quality cardiopulmonary resuscitation (Sandroni et al, 2007; Stergioulas, 2005). The present investigation showed that the PET had no satisfactory CPR knowledge, since their mean score in the CPR scale was low according to the numbers of correct answers. Our results are in line with Zaharopoulos *et al.*, (2007) findings. Also, Rasmus and Czekajlo (2007) found out that the majority of the subjects who participated in their study, assessed CPR knowledge as inadequate and believe that CPR training should be improved. Similar were the results of Akpek and Kayhan,(2003), who showed that the level of CPR knowledge in the public in Turkey was low.

The low level of theoretical knowledge can be partly explained by the opinion that only 15.9% of the participating subjects had trained in a CPR program during the last 6 months before to the present investigation (Berdin *et al.*, 1993; Nyman and Sihvonen, 2000; Grześkowiak et al, 2009).

Research trials have shown that continuous training at least every six months contributes to detainment both performance and theoretical knowledge skills. These point out the need for permanent training (International Liaison Committee on Resuscitation, 2005). Recent studies have shown that CPR conducting by health professionals and other subjects is of poor quality. The reason for this is the wrong application of CPR procedure that received during basic education (Parnell and Larsen, 2007).

In a recent qualitative study, that we conducted in the same population (Vasilakis et al, 2018), we found that all citizens need to have first-aid knowledge and to certify every 2 years, since the importance of first aid in

emergency situations and in everyday life can save a human life or prevent a serious disability. Most of the responders noticed that «It is our duty to assist in emergencies, with correct and complete knowledge. We need to know how the help we provide will be effective and in no way worsen the situation of the injured» (Vasilakis *et al.*, 2018).

We believe that by educating all citizens, in the basic application of first aid and by certifying their knowledge on a regular basis, we improve their effective response to emergency situations. As was reported in the results section, the educational level of the participants PET did not affect the CPR knowledge, but only the items «In case of emergency situation, the pulse is checked in the wrist», «The goal in cardiopulmonary resuscitation is to open the child's airways by using the method of tilting the head back and lifting the jaw» and «First aid is the assistance given to any person suffering a sudden illness or injury, before the ambulance, doctor, or other specialist». As noticed earlier the knowledge does not have a relationship with the education (PET degree, second degree, MA, or PhD) of the subjects, but with the refreshment of CPR procedures.

In the elementary schools today, first aid is considered to be mostly a case of educational PET given its knowledge of anatomy and the treatment of certain musculoskeletal injuries (sprains, muscular spasms, etc.). However, although such situations are very common at elementary schools every day, there are seizures or fainting episodes of students and teachers who need immediate help. CPR knowledge of his basic studies makes his intervention very often unsafe both for the sufferer and for himself. In secondary education, in particular, PET cover teaching needs of more than one school unit, resulting in their frequent and justified absence from them. So, we think that the hitherto prevailing perception that first aid is a matter that should only concern PET is wrong.

Conclusion

The present study showed that PET working on elementary schools of East Attica, had inadequate knowledge of CPR. Also, the education level does not affect their CPR knowledge. It seems that PET in order to give effective CPR manipulations, they should be educated at least every six months periods. Correct administration of CPR can do the difference between life and death, fast versus continuing for a long time recovery, and lasting for only a limited period of time versus permanent disability.

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How to cite this article:

Vasilakis, N., A. Tripolitsioti and Stergioulas, A. 2018. Education Level Do Not Affect the Knowledge of Cardiopulmonary Resuscitation of Physical Education Teachers. *Int.J.Curr.Res.Aca.Rev.* 6(6), 1-8.

doi: <https://doi.org/10.20546/ijcrar.2018.606.001>