Attitudes of Doctors Working in Abant Izzet Baysal University Health Research and Application Center on Cardiopulmonary Resuscitation

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Introduction

Cardiopulmonary arrest (CPA) is a sudden stop in spontaneous respiration and blood circulation. Resuscitation can be defined as the effort made to re-gain spontaneous heartbeat, respiration and cardiac functions. Heart diseases cause 90% of sudden deaths, and non-heart diseases cause 10%. At the moment of arrest in these patients, a ventricular fibrillation (VF) rhythm can be commonly observed. Accordingly, the time between arrest and defibrillation affects the success of resuscitation to a great extent. There is a vital relationship between the heart, lungs and brain. Hence, when the function of one of these three organs stops, the functions of the other two organs also stop after a short time (1, 2). Even if the heart continues its pumping action for a few minutes after the respiration of the patient stops, the blood entering the brain contains insufficient oxygen. Consequently, death occurs because of a lack of oxygen in the brain tissue (1). Performing urgent and effective cardiopulmonary resuscitation (CPR) is of vital importance for patients with cardiac arrest (3, 4).

Cardiopulmonary resuscitation is a symptomatic treatment method that aims to maintain the functions of vital organs until the heart begins to function again. The whole process that is performed in cardiac arrest treatment is called CPR (5). Because information on the approach to CPR is continuously improving, health staff who encounter arrest cases more commonly must be given education at regular intervals and must be informed about new improvements. Only those who receive effective education have high success levels after education and can perform effective and accurate CPR after improvements (4, 6-9).

The duties and responsibilities of doctors are important for the first intervention in cardiac arrest. This study aimed to reveal the attitudes of doctors about the recognition of cardiac arrest and starting and maintaining CPR, to evaluate their knowledge on recent improvements and to contribute to educational programs with the obtained data.
Methods

This descriptive study was conducted to evaluate the attitudes of doctors about CPR. The research was conducted on doctors working at the Abant Izzet Baysal University Health Research and Practice Centre after receiving approval from the Ethics Committee for Clinical Research in Abant Izzet Baysal University on 20 February 2012 (no: 2012/31). Research data were collected through a questionnaire designed in accordance with the literature. The questionnaire form consisted of 30 questions about the doctors’ demographic features and general knowledge of CPR (Appendix 1). The responses to the questionnaire were evaluated as correct and incorrect. The questionnaire forms were administered to 234 doctors who worked at the Abant Izzet Baysal University Health Research and Practice Centre and who agreed to participate in the study between 27 February 2012 and 04 June 2012 after their written informed consent was obtained. Before the survey, the aim of the research was explained to the participants. Doctors who were in rotation at the time of the questionnaire administration (between 27 February 2012 and 04 June 2012) and who declined to participate in the study were excluded.

Statistical analysis

When evaluating the findings of the study, Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL, USA) for Windows 15.0 software was used for statistical analyses. The chi-square test was employed for categorical variables. Data were presented as the number of individuals and percentage in tables. A value of p<0.05 was accepted as significant.

Results

A total of 234 doctors (118 lecturers and 116 research assistants) who worked at Abant Izzet Baysal University Health Research and Practice Centre participated in the study. The questionnaire forms were given to 20 doctors (8.5%) from the Basic Sciences, 127 doctors (54.3%) from the Internal Sciences and 87 doctors (37.2%) from the Surgical Sciences. Of the participants, the percentage of doctors who performed CPR was 77.4% (n: 181) and the percentage of doctors who watched CPR was 128% (n: 30). According to the results of the questionnaire, 70.3% (n: 83) of the lecturers and 84.5% (n: 98) of the research assistants had performed CPR previously. This difference was statistically significant (p: 0.018) (Table 1).

The study revealed that 38.0% of doctors (n: 89) attended a CPR course previously and 62% (n: 145) did not attend one. In total, 77.4% of doctors (n: 181) wanted to attend a CPR course; however, 22.6% (n: 53) did not want to attend. Of the participants, 35.6% (n: 42) of lecturers and 36.2% (n: 42) of research assistants knew about the 2010 Resuscitation Guidelines, and the difference between them was not statistically significant (p: 0.922).

Of the doctors, 64.1% (n: 150) put the chain of survival in the correct order; however, 35.5% (n: 83) put it in incorrect order. In total, 71.9% (n: 64) of doctors who had attended a CPR course previously and 59.3% of doctors (n: 86) who had not attended a course gave correct answers to the same question. This result was found to be statistically significant (p: 0.039) (Table 2).

<table>
<thead>
<tr>
<th>Table 1. Rates of cardiopulmonary resuscitation in participants</th>
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<tr>
<td>Yes (performed)</td>
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<td>No (not performed)</td>
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*p Statistically significant (p value is between a and b), chi-square test

<table>
<thead>
<tr>
<th>Table 2. Comparison of responses given to some questions according to attendance of a cardiopulmonary resuscitation course</th>
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<tbody>
<tr>
<td>Doctors that attended course (n, %)</td>
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<tr>
<td>Which is the correct order of the chain of survival in adult cardiac arrest treatment?</td>
</tr>
<tr>
<td>Correct</td>
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<td>Incorrect</td>
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<td>p=0.039*</td>
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<tr>
<td>According to the 2010 Resuscitation Guidelines, what is the correct number of cardiac compressions per minute while performing adult CPR?</td>
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<tr>
<td>Correct</td>
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<tr>
<td>Incorrect</td>
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<tr>
<td>p=0.014*</td>
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<tr>
<td>What should be done immediately after defibrillation during CPR?</td>
</tr>
<tr>
<td>Correct</td>
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<tr>
<td>Incorrect</td>
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<td>p=0.003*</td>
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*p Statistically significant (p<0.05), chi-square test. CPR: cardiopulmonary resuscitation
The rate of participants who gave the answer ‘I call the resuscitation team’ to the question ‘What is your first intervention if you do not feel a pulse in a patient developing loss of consciousness while being followed in the hospital?’ was 32.9% (n: 77). 61.1% (n: 143) of participants chose the answer ‘Cardiac massage is started’ (Table 3). For the question ‘Which choice describes an automated external defibrillator (AED) correctly?’, 51.3% of the doctors (n: 120) gave the correct answer (Table 4).

For the question ‘What is the rate of chest compressions per minute in adult CPR according to the 2010 Resuscitation Guidelines?’, 65.2% of the participants who attended a course answered correctly, while the rate for the doctors who did not take a course was 47.6%. This result was found to be statistically significant (p: 0.014) (Table 2). For the question ‘What should be done immediately after defibrillation during CPR?’, 71.9% (n: 64) of the doctors who had attended a CPR course and 51.7% (n: 75) of the doctors who had not taken a course gave the correct answer. This difference was statistically significant (p: 0.003) (Table 2).

The answers given to the question about how many joules are necessary to begin defibrillation with a monophasic defibrillator in adult patients were compared considering the positions of the participants, and no statistically significant difference was observed. However, the difference between the rate of correct answers given by the participants who had attended a course and who had not attended a course was statistically significant (p<0.005).

Discussion

In the USA, the population of which is approximately 300 million, approximately a million people die every year of cardiovascular diseases, which constitute about half of the causes of mortality. The rate of mortality due to coronary artery disease is 350,000 per year, and most of these are sudden deaths (10).

Approximately 2/3 of sudden deaths due to coronary artery disease occur outside the hospital, generally within the first two hours after the beginning of symptoms (11).

Based on research results from other countries, because distinct data on the conditions in Turkey are not available, it can be said that good and rapid emergency care systems, immediate early CPR and early defibrillation are important. In developed countries, health staff are required to learn early CPR as well as doctors (12, 13).

Anyone can encounter a CPA case at any place, at any time. It is a conscientious and legal responsibility that doctors and allied health personnel, who have a high likelihood of encountering CPA, must start CPR immediately.

Resuscitation is a procedure that must be performed with full knowledge. This study aimed to investigate how much doctors knew about resuscitation and about new improvements.

In a study by Akilli et al. (14), the rate of doctors who encountered CPA and performed CPR was found to be 90%. In our study, it was revealed that 90% of the participants performed CPR and/or watched it.

Moreover, in our study, the rate of research assistants who stated that they had performed CPR previously was found to be higher than that of lecturers. This difference may result from the fact that arrest cases more frequently occurred during the duties of research assistants.

Our study revealed that research assistants were more enthusiastic about learning CPR than lecturers. Research assistants answered the question about whether they wanted to attend a course on CPR with ‘yes’ at a higher rate than lecturers. This result was attributed to the higher possibility of encountering a CPA case for research assistants.

In a thesis study performed in 2008 on the attitudes of nurses towards CPR, it was reported that most participants (91.4%) chose ‘yes’ for the statement ‘I apply the look, listen and feel method while controlling the respiration of the patient’ (15). Similarly, in our study, it was found that 92.7%
(n: 217) of doctors used the look, listen and feel method for controlling the respiration of a patient developing loss of consciousness in hospital.

It was demonstrated that immediate, rapid, strong and uninterrupted chest compression increased the survival rate in cases of CPA in adults (16). In a study by Bilir et al. (17), 42.5% of doctors correctly answered the question about the compression:respiration ratio. In the study of Kımaz et al. (12), the correct compression:ventilation ratio was known by 18.9% of participants. On the other hand, the rate of those who chose a 5:1 ratio was found to be 80%. Half of the doctors in our study chose the cardiac compression/respiration ratio of 30:2 in the presence of double rescuers in adult CPR, which was the correct answer. Other doctors chose 15:2 and 5:1 ratios. This low rate shows that doctors do not follow the improvements in the European Resuscitation Council guideline that is published every five years, and they do not receive sufficient education on this subject.

In a study conducted on nurses, the rate of those who knew the correct number of cardiac compressions per minute was 66%, which was similar to that in our study (15).

The most common cause of sudden death in patients with acute myocardial infarction is ventricular fibrillation, and its definite treatment is electrical defibrillation. The success of defibrillation in stopping arrhythmia depends on early application (18). In ventricular fibrillation cases, the success rate is 100% if necessary intervention is performed within the first 30 seconds. However, for every minute that defibrillation is delayed, the survival chance decreases by 7 to 10%. After 10 minutes, there is no survival chance for the patient. In our study, the question ‘how many joules are necessary to begin defibrillation with a monophasic defibrillator in adult patients?’ was answered correctly by 203% of lecturers and 12.1% of research assistants. It was found that 28.1% of doctors who attended a CPR course and 9% of doctors who did not attend a course gave correct answers to the same question. These rates, which are quite low, show the importance of organizing CPR education programs.

Atropine, which previously was routinely used in Asystole and Pulseless Electrical Activity, is not recommended in the 2010 Resuscitation Guidelines. 56.4% of the participants answered the question on this topic incorrectly. This shows that the doctors that participated in the study were not aware of recent developments in the 2010 Resuscitation Guidelines.

Success in CPR is obtained through good and continuous education. Education is overemphasised in the guidelines. The goal of education is to help the man in the street, civil defence experts, health staff in the field, emergency medicine teams or resuscitation teams to gain the ability to perform CPR at a clinical level.

The studies that were conducted showed that simple knowledge skills deteriorated within 1 to 6 months following education (19). In the study of Chamberlain et al. (20), it was reported that education repeated in the 6th month was effective for the protection of knowledge and skills.

In a study by Moser et al. (21), it is recommended that a brief repetition should be performed every 3 to 6 months and education should be repeated once a year. Indeed, in the 2010 guidelines, it is recommended that doctors should be educated more frequently than every six months (22). In another study, Dane et al. (23) compared the interventions performed by nurses who were and were not given CPR education. While 37.5% of patients who received early CPR from educated nurses remained alive, only 10.3% of patients who received CPR from uneducated nurses survived.

Conclusion
As a result of the evaluation of data obtained from this study, which was conducted with the aim of evaluating the knowledge levels of doctors about resuscitation and determining whether they were aware of new developments, it has been detected that doctors working in hospital lack knowledge about resuscitation, and this lack is at a level that can be overcome. We suggest that in-service training programs, courses, seminars and symposiums should be organised in order to resolve this lack of knowledge and to update the knowledge of doctors who are effective in the improvement and maintenance of public health.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Abant Izzet Baysal University School of Medicine (2012/31).

Informed Consent: Written informed consent was obtained from doctors who participated in this study.

Peer-review: Externally peer-reviewed.


Conflict of Interest: No conflict of interest was declared by the authors.

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References
### Appendix 1. Questionnaire form

1- Your age?
   - a) 25–30 years
   - b) 30–40 years
   - c) 40–45 years
   - d) Above 45 years

2- How long have you been working as a doctor?
   - a) Less than 1 year
   - b) 1–5 years
   - c) 6–10 years
   - d) More than 10 years

3- What is your department in the hospital?
   - a) Basic sciences
   - b) Internal sciences
   - c) Surgical sciences

4- What is your position in the hospital?
   - a) Lecturer
   - b) Research assistant

5- Have you ever performed cardiopulmonary resuscitation (CPR)?
   - a) Yes
   - b) No
   - c) Watched

6- Have you ever attended any course on CPR?
   - a) Yes
   - b) No

7- If a course or an in-service training program on CPR is organised, do you want to attend it?
   - a) Yes
   - b) No

8- Do you know about the 2010 Resuscitation Guidelines?
   - a) Yes
   - b) No

9- Which one is not a member of the International Liaison Committee on Resuscitation (ILCOR), which designed the 2010 Resuscitation Guidelines?
   - a) American Society of Anaesthesiologists (ASA)
   - b) European Resuscitation Council (ERC)
   - c) American Heart Association (AHA)
   - d) Heart and Stroke Foundation of Canada (HSFC)

10- Which is the correct order of the chain of survival in adult cardiac arrest treatment?
   - a) Early CPR, early help, early defibrillation, early advanced life support
   - b) Early help, early CPR, early defibrillation, early advanced life support
   - c) Early help, early CPR, early advanced life support, early defibrillation
   - d) Early advanced life support, early defibrillation, early help, early CPR

11- Which is the correct order of the resuscitation steps?
   - a) Basic Life Support, Advanced Life Support, Long-Term Life Support
   - b) Advanced Life Support, Long-Term Life Support, Basic Life Support
   - c) Compression, Ventilation, Defibrillation
   - d) Monitorisation, Intubation, Cardiac Massage

12- Which must be controlled first in the evaluation of a patient or an injured person?
   - a) Consciousness
   - b) Respiration
   - c) Circulation
   - d) Patency of the airway

13- Which one is not included in the algorithm of Basic Life Support?
   - a) Calling for help
   - b) Opening the airway
   - c) Performing cardiac massage
   - d) Applying adrenalin

14- Which method is used for controlling the respiration of an unconscious patient?
   - a) Look-listen-feel
   - b) Jaw-thrust
   - c) Heimlich manoeuvre
   - d) Recovery

15- Which manoeuvre is used to provide patency of the airway in an unconscious patient without head-neck trauma?
   - a) Lifting the chin forward and up
   - b) Turning the head to the side
   - c) Cleaning inside the mouth
   - d) Tilting the head backward and lifting the chin forward and up

16- You are the first person who reaches a patient after trauma. You notice that patient does not have respiration. Which step must not be performed?
   - a) Start artificial respiration
   - b) Provide patency of the airway
   - c) Ask for help
   - d) Place the patient in the recovery position

17- Which position must be given to a patient to whom CPR will be performed?
   - a) Supine position on hard and flat surface
   - b) Supine position on soft surface
   - c) Prone position on hard and flat surface
   - d) Prone position on soft surface
### Appendix 1. Questionnaire form (Continuous)

18- Which choice describes an automated external defibrillator (AED) correctly?
- a) It has been developed for defibrillation in a case of arrest witnessed by an ordinary person who has taken a Basic Life Support course.
- b) It has been developed for nurses who have been given advanced life support courses to be able to perform defibrillation rapidly, especially in areas of hospitals that are far away from the emergency unit.
- c) It has been developed for increasing survival rates in arrest cases in airplanes. It is used by pilots.
- d) It has been developed for ambulance staff to be able to perform defibrillation even if they work without a doctor.

19- What is your first intervention if you do not feel a pulse in a patient developing loss of consciousness while being followed in the hospital?
- a) Resuscitation team is called
- b) Patient is defibrillated
- c) Cardiac massage is started
- d) Oxygen is given

20- Which compression/respiration ratio is correct in the presence of double rescuers in adult CPR?
- a) Compression/respiration ratio 15/2
- b) Compression/respiration ratio 100/2
- c) Compression/respiration ratio 5/1
- d) Compression/respiration ratio 30/2

21- What is the rate of chest compressions per minute in adult CPR according to the 2010 Resuscitation Guidelines?
- a) 50
- b) 75
- c) 100
- d) 150

22- Which is the correct place for performing cardiac compression?
- a) 1/3 lower part of the sternum, by bending the arm from the elbows
- b) 1/3 lower part of the sternum, by not bending the arm from the elbows
- c) 1/2 lower part of the sternum, by bending the shoulder from the elbows
- d) 1/2 lower part of the sternum, by not bending the arm from the elbows

23- Which step is not performed for a patient who has a regular rhythm, but no heartbeat by listening?
- a) Cardiac massage is performed
- b) Airway is controlled
- c) Oxygen is given
- d) Defibrillation is performed

24- Which rhythm causes sudden cardiac death most commonly?
- a) Ventricular asystole
- b) Ventricular tachycardia
- c) Ventricular fibrillation
- d) Idiopathic arrhythmia

25- What must be done immediately after defibrillation during CPR?
- a) Rhythm must be controlled
- b) Cardiac massage must be continued
- c) Blood gas must be taken
- d) Pulse must be controlled

26- In which of these situations is defibrillation performed?
- a) Atrium fibrillation
- b) Electrical activity without pulse
- c) Ventricular tachycardia without pulse
- d) Atrial flutter

27- How many joules are necessary to begin defibrillation with a monophasic defibrillator in adult patients?
- a) 150 j
- b) 200 j
- c) 300 j
- d) 360 j

28- Which drug is not given in asystole and electrical activity without pulse?
- a) Adrenalin
- b) Atropine
- c) Dopamine
- d) Sodium bicarbonate

29- When is adrenalin given in refractory ventricular fibrillation?
- a) After 1st shock
- b) After 2nd shock
- c) After 3rd shock
- d) After 4th shock

30- Which of these is the method and dose of adrenalin application?
- a) 1 mg IV 3–5 per minute
- b) 1/2 mg IV 3–5 per minute
- c) 1 mg PO 3–5 per minute
- d) 1/2 mg PO 3–5 per minute

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**Answer Key:**

1) 6) 11) a 16) d 21) c 26) c
2) 7) 12) a 17) a 22) b 27) d
3) 8) 13) d 18) a 23) d 28) b
4) 9) d 14) a 19) a 24) c 29) c
5) 10) b 15) d 20) d 25) b 30) a