

Original Article

## Simulation of CPR Application with Telephone Guidance: Participants' Knowledge and Opinions

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### Abstract

**Introduction:** The life-saving procedure, Cardiopulmonary resuscitation (CPR), is only applied in 30% of cardiac arrest cases as a result of many factors, such as lack of knowledge and fear of causing further damage. Due to the importance of immediate application of CPR, some National First Aid Centres around the world provide the necessary instructions to the potential rescuer by telephone to overcome any obstacles and difficulties (Telecommunication CPR - TCPR) appear.

**Aims:** The aim of the study was to investigate the knowledge and experience of the subjects' participation in a simulated cardiac arrest scenario in which they applied CPR guided by telephone instructions.

**Methodology:** This was a cross-sectional study of subjects who were asked to perform CPR, with chest compressions only, following telephone instructions in response to a simulated cardiac arrest incident scenario. Before and after their participation, they completed specific questionnaires measuring their opinion and knowledge about CPR. The statistical package SPSS ver.24 was used to analyse the results. The significance level was set at  $p < 0.05$ .

**Results:** The sample was consisted of 151 people with an average age of 38 years (58,9% male VS 41,1% female). The 90.7% (n=137) were not health professionals as well as the 83.4% of respondents (n=126) knew what CPR was. The 76.2% of participants had no previous training in CPR. The 97.7% (n=138) felt that the telephone instructions were easy to understand while among those who had previously been trained in CPR, the 33 (91.7%) said that the previous knowledge they had was helpful in combination with the provided telephone instructions. Finally, 57% (n=86) of the participants experienced anxiety.

**Conclusions:** Overall, through the current research it is demonstrated that the telephone instructions are easy to understand and implement as the overall process was described as easy, although more than half of the participants experienced anxiety. It is important to note that the majority of the participants with previous training in CPR, stated that their previous knowledge combined with the telephone instructions, helped them cope with the experiment.

**Key words:** tCPR, CPR, cardiac arrest, telecommunicator – CPR

## Introduction

Cardiorespiratory arrest (CR) is defined as the sudden cessation of cardiac or respiratory function or both, causing inadequate oxygenation of tissues, which, if not reversed immediately, is fatal. The main clinical manifestations of cardiorespiratory arrest include the following: absence of pulse, absence of respiratory movements, possible airway obstruction, loss of consciousness, cyanosis (Koster et. al, 2010; Olasveengen et. al., 2021)

According to the American Heart Association, 350,000 cases of out-of-hospital cardiac arrest are seen every year in the United States of America (USA). Moreover, it is the third most common cause of death annually in Europe and is the cause of up to 20% of deaths in the Western world, while the incidence of cardiac arrest in Europe is approximately 84 cases per 100,000 inhabitants per year. Survival rates after a cardiac arrest episode vary around the world with Asia at 36%, the USA at 11%, Australia and New Zealand at 12% respectively. Regarding survival rates 30 days after hospital discharge, it ranges between 15% - 34% (Bobrow et. al. 2010; Chalkias et. al. 2023).

The application of Cardiopulmonary Resuscitation (CPR) can be life-saving, but as expected, the bystanders face a quite stressful situation where theoretical and practical knowledge must be combined in the best possible way to achieve positive results. However, due to the importance of immediate application of CPR to keep the patient alive, some National First Aid Centres around the world provide the necessary instructions to the potential rescuer by telephone to cover any obstacle and difficulty (Telecommunication CPR - TCPR) (Lerner et al 2012).

It is noted that the likelihood for a bystander to perform CPR is increased when it is instructed by telephone. In two studies, it is shown that the involvement of the rescuer by telephone using strict instructions, combined with the motivation provided to the bystander, contributes to increased rates of positive bystander response and ultimately CPR implementation. It is important to highlight this finding, as according to the international relevant literature, CPR is only applied in

30% of cardiac arrest cases as a result of many factors, such as among others, lack of knowledge and fear of causing further harm (Lewis et. al, 2013; Mao et. al 2020; Leong et. al, 2021)

The aim of the study was to investigate the subjects' knowledge and experience of participating in a simulated cardiac arrest scenario in which they applied CPR guided by telephone instructions.

## Methodology

The study sample consisted of individuals from the general population. The experiment was conducted in different public places where participants were asked to perform Cardiopulmonary Resuscitation (CPR), with chest compressions only, following telephone instructions in response to a simulated cardiac arrest incident scenario.

The study participation criteria:

- Adult subjects over 18 years of age.

- Subjects aged 18 years or older.

Adults eligible to communicate in the English or Greek language:

- Individuals who have been trained in Basic Cardiopulmonary Resuscitation within the last two (2) years.

Exclusion criteria:

- Persons under 18 years of age.

- Individuals unable to communicate in the Greek or the English language.

- Persons with mental retardation

## Research tools

The research form used in the survey included questions on demographic characteristics, questions exploring knowledge about CPR, participants' evaluation of CPR implementation, and questions about participants' opinions regarding their participation in the survey. The demographic characteristics form included questions about participants' gender, age, education level and occupation. The questionnaire form to explore participants' knowledge about CPR consisted of the questions: Do you know what cardiopulmonary resuscitation (CPR) is? What is CPR? Have you had to perform CPR in the past? Have you had to perform CPR in the past following telephone instructions? Would you ever perform CPR in real-life situations with guidance? The participant opinion measurement form to provide feedback on the study and possible suggestions for process improvement

consisted of 9 questions. More specifically, participants responded to: Do you feel that the telephone instructions were easy to understand? Do you think the telephone instructions were easy to implement? Do you consider that the telephone instructions were adequate and helpful? Do you consider that you applied the CPR correctly? Do you find the whole procedure difficult? Did you experience any stress when performing the CPR? Would you ever perform CPR in real-life conditions with guidance? In case you have been trained in the past to apply CPR, do you feel that the knowledge combined with the telephone instructions helped you? Do you wish to be trained in CPR after this experiment?

**Rateability analysis:** The internal consistency test was performed using the Cronbach's alpha reliability coefficient. The coefficient was calculated to be 0.704 revealing excellent reliability of the RCSQ. No question removal significantly increased the coefficient value.

**Internal consistency reliability:** For checking the Internal consistency reliability, a Cronbach's alpha correlation coefficient was used for subdimensions and total scale for testing the quality of items and item-total correlation analysis was done.

**Content validity:** Evaluates the ability of an instrument to cover all the relevant parts of an instrument that it aims to measure. The content of the present scale's validity index determination method was used for the item basis content validity index (CVI) and the instrument basis content validity index (CVI) (Lawshe 1975).

**Face validity** is about whether a test appears to measure what it's supposed to measure. This type of validity is concerned with whether a measure seems relevant and appropriate for what it's assessing on the surface. The face validity it was checked and it was found that the validity assessment was positive.

**Construct validity:** Pearson's correlation coefficient was used to elect construct validity. All questions showed statistically significant correlations between the total score of the questionnaire. Also, as an assessment of validity, experts who know or are professionally involved with the concept to be measured were asked to assess whether the measurement tool targets what it claims to

measure. Thus, after evaluation by two nurses and one physician, the validity assessment was positive.

**Test-retest analysis:** In order to test the reliability of repeated measures of the questionnaire, the ICC index was used. The questionnaire was redistributed to the 50 subjects who participated in the pilot study after 10 days in order to complete it again. Extremely high reliability was found between the two measures (ICC=0.982  $p < 0.001$ ).

**Statistical analysis:** The Statistical Package for Social Sciences version 25 (SPSS) was used for data management. In descriptive statistics, quantitative variables were presented as mean (Mean)±standard deviation (SD), while qualitative variables were presented in the form of absolute (n) and relative frequencies (%). All normality tests were performed using the Kolmogorov-Smirnov statistical criterion. Pearson's  $\chi^2$  statistical criterion was used to investigate correlations between independent qualitative variables. In the case where the conditions for applying the test did not apply, Fisher's and Monte Carlo tests were used. In order to investigate correlations between the independent quantitative variables, Pearson's correlation coefficient  $r$  was used, when the variables followed the normal distribution, and Spearman's correlation coefficient  $\rho$ , when the variables did not follow the normal distribution. For comparison between two independent groups with two levels, the student t-test statistical criteria were used when the groups followed the normal distribution, and the Mann-Whitney test when the groups did not follow the normal distribution. For the comparison between two independent groups with more than two levels, the Anova statistical criteria were used when the groups followed the normal distribution, and Kruskal-Wallis when the groups did not follow the normal distribution. Finally, Least Significant Difference (L.S.D) and Bonferroni correction tests were used for multiple comparisons. The significance level for all tests will be set at  $p < 0.05$ .

**Ethics:** The study was approved by the Research Ethics Committee of the University of West Attica. Furthermore, participant's rights, their personal information and all the ethical parameters were protected according to the Declaration of Helsinki. In addition, all

participants were informed in detail and signed a consent form before participation.

## Results

### Demographic characteristics

Our sample consisted of 151 subjects with a mean age of 38.33 years and a standard deviation of 15.75 points. The 58.9% (n=89) of the participants were female, while 41.1% (n=62) were male. The 35.8% (n=54) had secondary education, 47.7% (n=72) held a Bachelor qualification and 16.6% (n=25) held an MSc/PhD qualification. The vast majority of participants (90.7%, n=137) were not health professionals and only a very small proportion (9.3%, n=14) were health professionals (table 1).

### Participants' knowledge of CPR

The largest percentage of respondents (83.4%, n=126) knew what Cardiopulmonary Resuscitation (CPR) was, while a much smaller percentage (16.6%, n=25) did not know. Previous training in providing CPR (more than 2 years) was available in 36 (23.8%) subjects while 115 (76.2%) subjects did not. The 5.3% (n=8) had needed to perform CPR in the past while the 94.7% (n=143) had not. Of the participants who had performed CPR in the past only 3 (n=5.3%) had performed CPR following telephone instructions. 98% (n=148) stated that they would have performed CPR in real life with guidance while 2% (n=3) would not (table 2).

### Answers to the CPR measurement form

In terms of participants' responses regarding the survey they participated in, 97.7% (n=138) felt that the telephone instructions were easy to understand, only 4.6% (n=7) felt they were not and 4% (n=6) did not know. Regarding the application of the telephone instructions, 90.7% (n=137) thought they were easy to apply, 7.3% (n=11) said don't know and 2% (n=3) said they were not easy to apply. For the 90.7% (n=137) the telephone instructions were adequate and helpful, for 4% (n=6) they were not and 5.3% (n=8) answered I don't know. The largest percentage of respondents (60.3%, n=91) considers that they applied CPR correctly, a very small percentage (25.8%, n=39) does not know if they applied it correctly and a smaller percentage (13.9%, n=21) considers that they did not apply it correctly. The 57.6% (n=87)

did not think the whole process was difficult, 33.8% (n=51) thought it was difficult and 8.6% (n=13) did not know. Regarding the stress experienced by the participants during the implementation of CPR, 57% (n=86) experienced stress, 31.8% (n=48) did not experience stress and 11.3% (n=17) did not know. The largest proportion (88.7%, n=134) stated that they would perform CPR in real-life situations with guidance. Among the people who had previously been trained in CPR 33 (91.7%) stated that knowledge combined with telephone instruction helped them. Finally, the vast majority of participants (94.7%, n=143) wished to be trained in CPR after this experiment (table 3).

### Relation between participants' knowledge and their responses to the CPR measurement form.

Below is presented the relationship between participants' responses and whether they knew what the CPR was before the survey was performed (Table 4). A statistically significant relation was observed between whether participants knew what CPR was and the question regarding whether the telephone instructions were easy to implement ( $p=0.006$ ). Among those who knew what CPR is, none of the participants felt that the telephone instructions were not easy to apply, while conversely, among those who did not know what CPR is, a small proportion of them felt that the telephone instructions were not easy to apply. There was also a statistically significant relation between whether participants knew what CPR was and the question regarding whether they felt they applied CPR correctly ( $p=0.005$ ). Participants who knew what CPR was, considered a higher percentage of participants thought they applied CPR correctly compared to participants who did not know what CPR was. The table 5 below shows the percentages of participants' responses to the CPR related form according to whether they had previously been trained in CPR (Table VII). Previous training in CPR provision appeared to be statistically significantly related to whether participants felt they applied CPR correctly ( $p=0.043$ ). Individuals who had previous training in CPR provision felt at a higher rate that they applied CPR correctly compared to individuals who had no previous training in CPR provision.

**Table 1: Demographic characteristics (n=151)**

|                                           |             |
|-------------------------------------------|-------------|
| Age                                       | 38.33±15.75 |
| <b>Gender</b>                             |             |
| Male                                      | 41.1% (62)  |
| Female                                    | 58.9% (89)  |
| <b>Educational Level</b>                  |             |
| Secondary Education                       | 35.8% (54)  |
| University Degree                         | 47.7% (72)  |
| MSc/PhD                                   | 16.6% (25)  |
| <b>Are you a healthcare professional?</b> |             |
| No                                        | 90.7% (137) |
| Yes                                       | 9.3% (14)   |

**Table 2: Participants' knowledge of CPR (n=151)**

|                                                                                       |             |
|---------------------------------------------------------------------------------------|-------------|
| <b>Do you know what Cardiopulmonary Resuscitation (CPR) is?</b>                       |             |
| No                                                                                    | 16.6% (25)  |
| Yes                                                                                   | 83.4% (126) |
| <b>Previous training in providing CPR (over 2 years):</b>                             |             |
| No                                                                                    | 76.2% (115) |
| Yes                                                                                   | 23.8% (36)  |
| <b>Have you ever needed to perform CPR in the past?</b>                               |             |
| No                                                                                    | 94.7% (143) |
| Yes                                                                                   | 5.3% (8)    |
| <b>Have you ever had to perform CPR in the past following telephone instructions?</b> |             |
| No                                                                                    | 98.0% (148) |
| Yes                                                                                   | 2.0% (3)    |
| <b>Would you ever perform CPR in real-life conditions with guidance?</b>              |             |
| No                                                                                    | 2.0% (3)    |
| Yes                                                                                   | 98.0% (148) |

**Table 3:** Participants' responses to the CPR related form

|                                                                                                                                                    | No         | I don't Know | Yes         |
|----------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------|-------------|
| 1. Do you consider that the telephone instructions were easy to understand?                                                                        | 4.6% (7)   | 4.0% (6)     | 91.7% (138) |
| 2. Do you consider that the telephone instructions were easy to implement?                                                                         | 2.0% (3)   | 7.3% (11)    | 90.7% (137) |
| 3. Do you consider that the telephone instructions were adequate and helpful?                                                                      | 4.0% (6)   | 5.3% (8)     | 90.7% (137) |
| 4. Do you consider that you have applied CPR correctly?                                                                                            | 13.9% (21) | 25.8% (39)   | 60.3% (91)  |
| 5. Do you consider that the whole process was difficult?                                                                                           | 57.6% (87) | 8.6% (13)    | 33.8% (51)  |
| 6. Did you experience anxiety while performing CPR?                                                                                                | 31.8% (48) | 11.3% (17)   | 57.0% (86)  |
| 7. Would you ever perform CPR in real-life conditions with guidance?                                                                               | 2.6% (4)   | 8.6% (13)    | 88.7% (134) |
| 8. If you have been trained in CPR in the past, do you consider that the previous knowledge combined with the telephone instructions assisted you? | 5.6% (2)   | 2.8% (1)     | 91.7% (33)  |
| 9. Do you wish to be trained in CPR after this experiment?                                                                                         | 2.0% (3)   | 3.3% (5)     | 94.7% (143) |

**Table 4:** Relation between whether participants knew what CPR is and their responses to the CPR related form.

|                                                                            |              | Are you aware of what Cardiopulmonary Resuscitation (CPR) is? |             |              |
|----------------------------------------------------------------------------|--------------|---------------------------------------------------------------|-------------|--------------|
|                                                                            |              | No                                                            | Yes         | p            |
| Did you consider that the telephone instructions were easy to understand?  | No           | 8.0% (2)                                                      | 4.0% (5)    | 0.590        |
|                                                                            | I don't know | 4.0% (1)                                                      | 4.0% (5)    |              |
|                                                                            | Yes          | 88.0% (22)                                                    | 92.1% (116) | <b>0.006</b> |
|                                                                            | No           | 12.0% (3)                                                     | 0.0% (0)    |              |
| Do you consider that the telephone instructions were easy to implement?    | I don't know | 4.0% (1)                                                      | 7.9% (10)   | 0.427        |
|                                                                            | Yes          | 84.0% (21)                                                    | 92.1% (116) |              |
| Do you consider that the telephone instructions were adequate and helpful? | No           | 8.0% (2)                                                      | 3.2% (4)    | 0.427        |
|                                                                            | I don't know | 4.0% (1)                                                      | 5.6% (7)    |              |
|                                                                            | Yes          | 88.0% (22)                                                    | 91.3% (115) |              |

|                                                                   |              |            |             |              |
|-------------------------------------------------------------------|--------------|------------|-------------|--------------|
|                                                                   | No           | 20.0% (5)  | 12.7% (16)  | <b>0.005</b> |
| Do you consider that you have applied CPR correctly?              | I don't know | 48.0% (12) | 21.4% (27)  |              |
|                                                                   | Yes          | 32.0% (8)  | 65.9% (83)  |              |
|                                                                   | No           | 56.0% (14) | 57.9% (73)  | 0.578        |
| Do you think the whole process was difficult?                     | I don't know | 4.0% (1)   | 9.5% (12)   |              |
|                                                                   | Yes          | 40.0% (10) | 32.5% (41)  |              |
|                                                                   | No           | 28.0% (7)  | 32.5% (41)  | 0.336        |
| Did you experience anxiety while performing CPR?                  | I don't know | 4.0% (1)   | 12.7% (16)  |              |
|                                                                   | Yes          | 68.0% (17) | 54.8% (69)  |              |
|                                                                   | No           | 0.0% (0)   | 3.2% (4)    | 0.621        |
| Would you ever perform CPR in real-life conditions with guidance? | I don't know | 12.0% (3)  | 7.9% (10)   |              |
|                                                                   | Yes          | 88.0% (22) | 88.9% (112) |              |
|                                                                   | No           | 8.0% (2)   | 0.8% (1)    | 0.104        |
| Do you wish to be trained in CPR after this experiment?           | I don't know | 0.0% (0)   | 4.0% (5)    |              |
|                                                                   | Yes          | 92.0% (23) | 95.2% (120) |              |

**Table 5:** Relation of participants' prior CPR training and their responses to the CPR measurement form.

|                                                                            |              | Previous training in CPR provision (over 2 years); |            |              |
|----------------------------------------------------------------------------|--------------|----------------------------------------------------|------------|--------------|
|                                                                            |              | No                                                 | Yes        | p            |
| Did you consider that the telephone instructions were easy to understand?  | No           | 4.3% (5)                                           | 5.6% (2)   | 0.873        |
|                                                                            | I don't know | 4.3% (5)                                           | 2.8% (1)   |              |
|                                                                            | Yes          | 91.3% (105)                                        | 91.7% (33) |              |
| Do you consider that the telephone instructions were easy to implement?    | No           | 2.6% (3)                                           | 0.0% (0)   | 0.881        |
|                                                                            | I don't know | 7.0% (8)                                           | 8.3% (3)   |              |
|                                                                            | Yes          | 90.4% (104)                                        | 91.7% (33) |              |
| Do you consider that the telephone instructions were adequate and helpful? | No           | 4.3% (5)                                           | 2.8% (1)   | 1.000        |
|                                                                            | I don't know | 5.2% (6)                                           | 5.6% (2)   |              |
|                                                                            | Yes          | 90.4% (104)                                        | 91.7% (33) |              |
| Do you consider that you have applied CPR correctly?                       | No           | 16.5% (19)                                         | 5.6% (2)   | <b>0.043</b> |
|                                                                            | I don't know | 28.7% (33)                                         | 16.7% (6)  |              |
|                                                                            | Yes          | 54.8% (63)                                         | 77.8% (28) |              |
|                                                                            | No           | 57.4% (66)                                         | 58.3% (21) | 0.744        |

|                                                                   |              |             |            |       |
|-------------------------------------------------------------------|--------------|-------------|------------|-------|
| Do you think the whole process was difficult?                     | I don't know | 9.6% (11)   | 5.6% (2)   |       |
|                                                                   | Yes          | 33.0% (38)  | 36.1% (13) |       |
|                                                                   | No           | 30.4% (35)  | 36.1% (13) | 0.616 |
| Did you experience anxiety while performing CPR?                  | I don't know | 10.4% (12)  | 13.9% (5)  |       |
|                                                                   | Yes          | 59.1% (68)  | 50.0% (18) |       |
|                                                                   | No           | 3.5% (4)    | 0.0% (0)   | 0.541 |
| Would you ever perform CPR in real-life conditions with guidance? | I don't know | 7.8% (8)    | 11.1% (4)  |       |
|                                                                   | Yes          | 88.7% (102) | 88.9% (32) |       |
| Do you wish to be trained in CPR after this experiment?           | No           | 2.6% (3)    | 0.0% (0)   | 0.647 |

## Discussion

In recent years there has been an increasing effort to train people in CPR in order to save more lives. However, a number of factors such as lack of knowledge, fear of causing further harm and anxiety, prevent citizens from performing CPR if needed. Abroad in particular, in the unfortunate event of a cardiac arrest incident, the bystander, once he/she has called the relevant pre-hospital services, receives support by telephone to apply CPR until specialist help arrives, bridging these barriers.

To begin with, regarding the participants' knowledge of the subject of CPR, the majority of them knew what it referred to although the majority of them had also received no previous training in the subject. Out of the 151 participants, almost all of them had not had to perform CPR before, whereas the extremely low percentage of people who had performed CPR with telephone guidance suggests that the experiment was for the most of them the first contact with CPR. The large majority stated that they would perform guided CPR in real-life settings and that they considered the telephone instructions given to them to be understandable, helpful and easy to implement, which indicates that telephone instructions are not the barrier to the correct implementation of CPR. There was also extremely little need to repeat the verbal instructions with satisfactory rates of positive performance evaluation. It is important to highlight that despite the positive overall

assessment of the participants, 57% responded that they experienced anxiety while performing the experiment, a rate that considering that this was a simulation and not a real-life event, would be considerably higher in a realistic condition potentially affecting the performance of CPR. Furthermore, among the subjects who had been previously trained in CPR, almost all of them stated that their knowledge combined with the telephone instructions helped them to cope with the experiment. However, it is observed that individuals with previous relevant education and health professionals had a statistically significant relationship regarding their more positive perception of their performance. However, no association was observed between possible previous similar experience (telephone instructions for performing CPR) and the quality of performance. The above results suggest that previous training in the field of CPR and, any professional friction with the field of resuscitation, positively enhance the individuals' broader connection to the field of CPR.

Comparing the findings of the present study with international research data on participants' anxiety, according to (Riegel et al. 2006), overall low levels of anxiety were noted when the bystander provided first aid; however, these rates were higher, but not high, when it was a cardiac arrest incident which partially matches the moderately high rate of 57% of individuals experiencing anxiety. In



this survey higher rates of anxiety were noted in women which was not observed in the current survey. In another similar study, by Tuffley et al. 2023, on the anxiety of bystander CPR providers, 32.2% reported experiencing anxiety, a significantly lower percentage than the present study. As a finding it is not surprising as a cardiac arrest incident is by definition a factor of anxiety for attendees, however, possibly, it would be expected that higher rates of anxiety would be recorded than eventually occurred.

Regarding the motivation to perform CPR, a study by Marine Riou et al 2018, emphasised the importance of prompting CPR from the health professional to the calling rescuer, using phrases such as "We will perform CPR" and avoiding phrases such as "Do you want to perform CPR?" as, based on the surveys, when the first phrase was used, 97% of callers responded positively, while 84% responded positively to the second phrase. Thus, it appears that the combination of short and "imperative" phrases is more effective in terms of quality and speed of CPR implementation. In this survey there was one single mode of giving instructions, with the main motivation being communicated as "...start compressions now.." instruction which appeared to motivate participants and therefore there were no refusals to start CPR. However, it should be emphasised that it was a different purpose of this study and approach to the participants.

Furthermore, regarding the motivation to apply CPR in relation to previous training, in a study by Birkenes et al. 2014, higher rates of CPR performance were observed in resuscitators with prior training when they received continuous telephone guidance compared to the group of resuscitators where they received instructions as usual. In the present study, there was one single pattern of instructions (with repetition and explanation when necessary) however, of those individuals who were previously trained in CPR, the majority reported that their knowledge combined with the telephone instructions helped them cope with the experiment, a finding which is linked to the research reported above. However, it is clarified that there is a difference in the duration of the experiment as it was 10

minutes compared to the present survey where it was 2 minutes.

Also, in a study by Swor et al. 2006, on the association between prior training and performance of CPR quality, 54.1% of people who needed to perform telephone-guided CPR had prior training which had a positive influence on their motivation to perform CPR. The above findings suggest the benefit of prior training in CPR in terms of likelihood of implementation and performance.

Regarding the limitations of the present study, an attempt was made to create a realistic cardiac arrest scenario, in which, however, the participant was given the absence of breathing as a given fact which relieved him from the airway-breathing check process and possibly affected the overall outcome of the experiment. Furthermore, there was no external disturbance factor as the experiment was conducted in an isolated and quiet room which may have positively influenced the participant's opinion. Continuing, the overall duration of the 2 minutes of the experiment possibly concealed any increased anxiety and possible negative experience in the following time until the specialized team arrived, as would be the case in a real-life incident.

**Conclusions:** Telephone instructions for the purpose of performing CPR on cardiac arrest victims is the bridge to keeping the victim alive through motivation, encouragement and implementation of the life-saving algorithm by the bystander. Overall, through the current research we demonstrate that the telephone instructions are easy to understand and implement and the overall process was described as easy. Overall, more than half of the participants experienced anxiety, and it is important to note that among participants with previous training in CPR (more than 2 years), the 91.7% stated that their knowledge combined with the telephone instructions helped them cope with the experiment. The present study fills a gap in the international and mainly Greek literature, but also raises important research questions. Thus, it would be beneficial to investigate the effectiveness of telephone instructions in regards with the time (longer than 2 minutes) and the mental state of the participant, as well as in more realistic conditions with external stimuli and interference. In addition, it would be

interesting to study the effectiveness using an AED and in combination with more than one resuscitator to investigate the interaction between resuscitators and the possible positive or negative influence of knowledge, mental state, and overall cooperation.

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