

Original Research Article

COMPARISON OF VIDEO CALL INSTRUCTIONS AND VOICE CALLS IN INDONESIAN LANGUAGE ON CHEST COMPRESSION ONLY HAND POSITION

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Abstract

Background: Out of Hospital Cardiac Arrest (OHCA) or cardiac arrest events that occur outside the hospital are the focus of world health problems which is often threaten a person's life. First aid that must be given quickly and precisely is Cardio Pulmonary Resuscitation (CPR). The rapid initiation of CPR with correct hand positioning by laypersons in cases of OHCA is critical for improving survival rates.

Objectives: The purpose of this study was to compare the accuracy of the hand position of the lay rescuer when performing chest compressions only which was instructed through video calls and voice calls in Indonesian Language.

Methods: This research was an experimental study. Sampling using probability sampling. The sample consists of 40 people who were divided into 2 groups, namely the instruction group via video call and voice call.

Results: The results show that in the video call group there were as many as 9 people (45%) who performed hand placement during CPR correctly, while in the voice call group there were 13 people (65%). The statistical results using Mann Whitney test showed that there was no significant difference between video call and voice calls instructions in Language ($p = 0.209$).

Conclusion: It needs the training for Emergency Medical Services (EMS) operator officers prior to conducting the study and the near real situations as the original incident in order to get more effective on performing chest compressions.

Keywords: *Cardiopulmonary Resuscitation (CPR), Hand Position, Video Calls, Voice Call*

INTRODUCTION

Heart diseases were the largest cause of the death in the world (Eko & Setianingsih, 2020). One of the most common heart diseases is coronary heart disease which can cause electrical disturbances in the heart, resulting in

Sudden Cardiac Arrest (SCA) / Cardiac Arrest (Muthmainnah, 2019). OHCA or cardiac arrest events that occur outside the hospital are the focus of world health problems that often threaten a person's life. In some countries the incidence of OHCA has increased, which

globally the incidence of OHCA is 50-60 per 100,000 people every year (Yunanto et al., 2017). While the prevalence of cardiac arrest cases in Indonesia is still unknown, clear data are not known, but it is estimated that there are approximately 30 cases of cardiac arrest per day (Febriana H et al., 2018).

The general public who was at the scene when OHCA occurred were expected to immediately provide first aid. Based on the recommendations of the AHA guidelines, lay rescuers can perform chest compressions only as instructed by voice call by Emergency Medical Services (EMS) officers (AHA Guideline, 2019). There are a few things that need attention to improve the quality of CPR on a crutch lay one hand positioning right. Incorrect hand position can result in injury to victims of cardiac arrest. If the hand is too high, chest compressions will be less effective and may cause fractures of the first and second ribs and the stern chondral joint. If the hand position is too low, compression can damage internal organs near the xiphoid process such as the liver, lungs, and spleen (Jo et al., 2015).

The rapid initiation of CPR with correct hand positioning by laypersons in cases of out-of-hospital cardiac arrest (OHCA) is critical for improving survival rates. However, many laypeople feel unprepared or lack the confidence to perform CPR without guidance. In such emergencies, immediate instructions over the phone from emergency medical services (EMS) can provide vital support, helping bystanders overcome hesitation and correctly execute CPR steps, the use of smartphones makes it very easy for emergency medical services to provide CPR instructions by using voice calls or video calls to maximize CPR actions given by lay rescuers. Based on this, this study will discuss the comparison of CPR actions instructed through video calls and voice calls in Indonesian to the accuracy of hand positions performed by lay helpers.

Objective (s): This study aimed to compare the accuracy of hand positioning by

lay rescuers performing chest compressions based on instructions given via video calls and voice calls in Indonesian.

METHODS

Study Design

This research was quantitative research that uses experimental research methods.

Setting

The research location was the Banjarbaru area, South Kalimantan who have never received training on CPR.

Research Subject

The sample was teenagers to adults (14-40 years) in the Banjarbaru area, South Kalimantan who have never received training on CPR. The sampling technique used probability sampling with the approach method using simple random sampling. The number of respondents in this study were 40 non-health bachelor degree students who were divided into 2 groups with 20 people in each group.

Intervention

In this study, 2 different treatments will be given in each group. The first group was given instructions via video call and the second group was given instructions via voice calls to perform CPR.

Forty respondents participated in the study, evenly divided into two groups of 20 people each. The groups were designated as follows: one receiving CPR guidance in Indonesian, and the other group receiving video call guidance. None of the participants had previous CPR training. The measured variables included chest compression rate, depth, hand position accuracy, and chest wall recoil.

CPR was conducted on an adult Prestan mannequin equipped with a High-Quality CPR (HQ CPR) indicator that uses three lights to signify compression frequency, depth, and hand position accuracy.

For video calls, the instructor used a Samsung A30S smartphone with a 6.4-inch

HD+ 720 x 1560 pixel Super AMOLED screen, while the helper used a Samsung A51 smartphone with a 6.5-inch 1080 x 2400 pixel Super AMOLED display. The guide's front camera had a 16 MP resolution, while the respondent's front camera was 32 MP. The video calls utilized Telkomsel's 4G LTE network, with an average download speed of 13.4 Mbps and an upload speed of 6.8 Mbps.

For audio guidance, cellular calls were conducted using the Telkomsel network service. The dispatcher used a Samsung A30S smartphone, and the respondent used a Samsung A51. Both the operator and respondent used loudspeaker mode at full volume while performing CPR.

Instruments

The instruments used were observation sheets and mannequins for CPR with the Prestan brand. The research tools used are; The Samsung A51 cellphone for making voice calls by respondents as lay rescuers, the Samsung A30s cellphone used by the team as EMS operator officers, and a device for recording lay rescuers' actions during the study using the b-gpro 5 Alpha camera. Internet network that is used for research are Telkomsel 4G LTE with the average - average speed of 13.4 Mbps and the average - average download speed - upload 6.8 MB. During a call loudspeaker mode is activated at 100% volume.

Data Analysis

The analysis carried out was univariate and bivariate analysis. Data processing using SPSS program and statistical test used is Mann Whitney.

Ethical Consideration

The ethical considerations in this study have received ethical approval from the Ethics Commission of the Faculty of Medicine, Lambung Mangkurat University No. 616/KEPK-FK ULM/EC/V/2021.

RESULTS

In this study, the characteristics of respondents based on age and gender were obtained. The respondents used in this study were ordinary people living in Banjarbaru, South Kalimantan who were divided into 2 groups, namely instructions via video calls and instructions via voice calls.

Table 1. Characteristics of Respondents'

Age					
Age	Mean	Median	Min-Max	SD	95% CI
Video Call (N=20)	21.60	22.00	20-23	0.821	21.22-21.98
Voice Call (N=20)	22.35	22.00	19-37	3.543	20.69-24.01

Table 1 shows that the average age of the respondents in the group that was given video call instructions was 21.60 and the average age of the group that was given voice call instructions was 22.35 with the median age of respondents in both groups being 22 years.

Table 2. Characteristics of Respondents'

Gender				
Gender	Video Call		Voice Call	
	N	%	N	%
Man	6	30	9	45
Woman	14	70	11	55

Table 2 shows that in the video call and voice call instruction group the sexes were mostly women, amounting to 14 people (70%) in the video call instruction group and 11 people (55%) in the voice call instruction group.

Table 3 shows that in the video call group there were as many as 9 people (45%) who performed hand placement during CPR correctly, while in the voice call group there were 13 people (65%).

Table 3. Accuracy of Hand Position When Performing Chest Compression Only with Video Call Instructions and Voice Calls

Group	Hand Position	
	Appropriate	Not exactly
Video Call N= 20	9 (45%)	11 (55%)
Voice Call N=20	13 (65%)	7 (35%)

Table 4 shows that the results of the analysis of the average ranking of the group with voice call instructions are higher than the ranking of the group with video call instructions.

Table 4. Comparison of Video Call Instructions and Voice Calls on the Accuracy of Hand Position When Performing Chest Compression Only

Group	N	Mean Rank	<i>p-value</i>
Video Call N= 20	20	18,50	0.209
Voice Call N=20	20	22.50	

The statistical results using test *Mann-Whitney* got value *p-value* of 0.209 or more than the value of α (0.05), the decision of test H_0 is received, so it was concluded that there was no difference between the instruction *video calls* and voice calls in Indonesian language to the accuracy of the position of the hand when doing *Chest Compression Only*

DISCUSSION

Based on the results above, it is known that there is no significant difference between video call instructions and Indonesian voice call on the accuracy of the hand position when performing Chest Compression Only. According to the recommendation of the American Heart Association (AHA) that EMS operators need to provide cardiopulmonary resuscitation instruction to the public who encounter out-of-hospital cardiac arrest events (Kleinman et al., 2015).

In this study, the results showed that more than 50% of respondents could follow voice call instructions correctly to reach the right compression point. Several other studies also showed mixed results on the placement of the hand position between instructions using video or with audio. Research conducted by Lin et al (2018) shows that the probability of instruction with audio is 0.8 times better than video instruction in placing the lay rescuer's hand in the right position (Lin et al., 2018).

The results of observations in the video call instruction group and voice calls in this study found that most respondents did not place the heel of the hand in the middle of the victim's chest. Based on the AHA guidelines, it is stated that the rescuer must place the heel of the hand in the center of the victim's chest to perform compressions (Jiang et al., 2020). Most of the respondents were right when placing their hands in the middle of the mannequin's chest, but the heel of the hand was on the side of the chest, so that when compression was applied, the ribs were compressed. In addition, the instruction to place the hand directly in the center of the chest / center of the chest (CoC) by pressing hard on the lower part of the sternum is very difficult to recognize by the lay rescuer (Choi et al., 2016). When respondents took the actions that were instructed either through video call instructions or voice calls, many felt confused, some people misunderstood the meaning of the instructions so that they put their hands too low on the breastbone and even in the abdomen area. This shows a lack of understanding by ordinary people about CPR, even though the respondents are at the same level of education, namely university.

The emotions felt by the lay rescuer can also have an effect. The success rate for performing CPR depends on the emotional and physical abilities of the person who actually performs CPR (Gupta et al., 2014). Some respondents felt unprepared when taking action, some looked very relaxed and

most looked nervous and scared. This can be seen from how they communicate with EMS operators and their hesitation when touching the mannequin. Another factor comes from the phone and the network used. The small screen size and the position of the respondent's mobile phone during a video call can affect the monitoring and feedback of various aspects of CPR quality such as hand positioning (Yang et al., 2009). In this study, when making a video call, the cell phone is set to be placed right next to the victim so that the right side of the victim's body is visible and is facing the lay rescuer. However, the research team as EMS operators still cannot predict whether the respondent's hand position is correct or not. The quality of the network used is quite good when making voice calls, but during video calls sometimes the video quality becomes low and pauses due to poor cellular internet coverage, causing communication to be disrupted when giving CPR instructions (Zhu et al., 2019).

The limitation of learning in this study was the lack of training for EMS operator officers prior to conducting the study. In addition, situations that are not as real as the original incident make respondents not too serious in taking action.

CONCLUSION

The results of this study, indicating that there is no significant difference between group instruction *video call* and group instruction voice calls Indonesian language to the accuracy of the hand position while doing *Chest Compression Only*.

SUGGESTIONS

For further research, it is recommended to further improve the quality of the EMS operator and make arrangements to make the place closer to the real situation in the field, so that it can be seen clearly how the results differ using instructions via voice calls and *video calls*.

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DECLARATION OF CONFLICTING INTEREST

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AUTHOR CONTRIBUTION

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