Assessment of Community Preparedness in Cardio Pulmonary Emergencies in Selected Cities in the Philippines

ABSTRACT

Background: Cardiovascular diseases (CVDs) are the leading cause of death globally, taking an estimated 17.9 million lives each year.(World Health Organization,2019).Bystander cardiopulmonary resuscitation (CPR) is critical to increasing survival from out-of-hospital cardiac arrest (OHCA). An individual experiencing OHCA is almost twice as likely to survive when witnesses perform CPR while emergency personnel are en route (Naim, et. Al. 2017).

Purpose: The study aimed to assess Basic Life Support (BLS) capability of the layperson in the community specifically the household members. In addition, determine key stakeholders' perception on Basic Life Support in communities preparedness.

Methods: The study was conducted in Metro Manila. Rapid Sampling was used and a total of 114 respondents were selected from two selected barangays.

Result: Mainstream of the respondents in Barangay Damayan perceived that BLS Critical Steps are needed in emergency care situation that comprise the 82.01 percent in contrast from 17.99 percent of responses of the respondents perceived critical steps in BLS are not needed. While the Mainstream of the respondents in Barangay Tumana perceived that BLS Critical Steps are needed in emergency care situation that comprise the 90.09 percent in contrast from 9.91 percent of responses of the respondents perceived critical steps in BLS are not needed.

Conclusion: Community preparedness is essential in responding emergency situation in cardio pulmonary cases. Individual should know to deliver first aid to save life and their capability to perform cardio pulmonary resuscitation. Assessment to patient promotes higher chances of survival until hospital emergency care system arrived. Training for the layperson in BLS-CPR represents one of the most successful strategies for increasing survival from sudden cardiac arrest.

Keywords: *assessment, community preparedness, cardio pulmonary,emergency*

BACKGROUND

Cardiovascular diseases (CVDs) are the leading cause of death globally, taking an estimated 17.9 million lives each year.(WHO,2019). Despite the deadly coronavirus disease 2019 (Covid-19) battering the country, coronary heart disease remains the top cause of death in the Philippines from January to November last year, according to the Philippine Statistics Authority. (Kabagani, et.al. 2022). In the United States of America, Heart disease is the leading cause of death for men, women, and people of most racial and ethnic groups in the United States. One person dies every 34 seconds in the United States from cardiovascular disease (CDC,2022) About 697,000 people in the United States died from heart disease in 2020—that's 1 in every 5 deaths (Tsao,2022). One of the types of CVD is Coronary Heart Disease. Coronary heart disease (CHD) occurs when your heart muscle's blood supply is blocked or interrupted by a build-up of fatty substances (atheroma) in the coronary arteries .And this condition can resulted to severe heart injury to the extend of complete stopage of blood flow and may lead to brain injury and damage. If this happened in the community bystander could help a lot to address this problem. Deconditioning of progressive with vicious cycle. (Baidya,2018).

Factor that could improve the chances of survival of cardiac arrest patients lies on the Pre-hospital, layperson should have enough knowledge on Cardio Pulmonary Resuscitation (CPR). It is important that preparation to respond to medical emergency in the community until the ambulance arrived.(Hagemeister,et.al.,2018).Hence lack of sufficient information on this intervention further intensified the recommendation to support the advocacy for more Filipinos to learn CPR. Bystander cardiopulmonary resuscitation (CPR) is critical to increasing survival from out-of-hospital cardiac arrest (OHCA). An individual experiencing OHCA is almost twice as likely to survive when witnesses perform CPR (Naim,2017).

OBJECTIVE

The study aimed to assess Basic Life Support (BLS) capability of the layperson in the community specifically the household members. For specific objective is to determine key stakeholders' perception on Basic Life Support, describe the performance of selected communities in performing Basic Life Support preparedness, determine the characteristics of barangay communities in emergency situation in terms of facilities, manpower and resources. The result of this study can support to recommend policy directives on BLS development base on the study result.The scope of this study was focus on one hundred and fourteen (114) respondents layperson, health workers and barangay officials from two selected barangays in Metro Manila; Barangay Tumana and Barangay Damayan. Further this study was explored their capabilities on how this laymen, health workers and barangay officials performed Basic Life Support in case of emergency for survival.

METHODS

Respondents of the Study

The study was conducted into two selected barangays in Metro Manila; Barangay Tumana in Marikina City and Barangay Damayan in Quezon City. These two barangays were chosen because of its physical difference when it comes to their elevation. Barangay Tumana is on flood prone areas while barangay Damayan is not on a flood prone area. The Far Eastern University Research Board Committee approved the research protocol. Prior to start the study, the researchers seek an approval from the Municipals, barangays, Health Centers, and informed consents from the layperson.

Using Rapid Sampling, 114 respondents were selected from two selected barangays; 62 respondents from Barangay Damayan and 52 respondents from Barangay Tumana. Inclusion criteria were 17 years old to 65 years old at the time of BLS performance and at least elementary graduate.

Tool of the Study

Self-administer Questionnaire that assess the perception of the respondents if Basic Life Support. Performance Evaluation Tool that assess respondents' performance on Basic Life Support, and The Focus group to validate their BLS performance.

Data Gathering Procedure

The questionnaire method was the mode of data gathering with quantitative approach. (1) Seeking approval from Far Eastern University Research Board Committee (2) Researchers seek an approval from the Municipals, barangays, Health Centers, and informed consents from the

layperson.(3) The study was conducted at Barangay Tumana in Marikina City and Barangay Damayan in Quezon City. (4)The answered answer the Self –administer questionnaire to determine key stakeholders' perception on critical steps of Basic Life Support.

STATISTICAL ANALYSIS

The data gathered from the respondents were tabulated and summarized them into tables to clarify and simplify the presentation of the data collected. Statistical analyses were applied to the data using the following descriptive-nonparametric technique: Percentage was used to describe the perception of layperson in both barangays if Basic Life Support is needed or not needed, to describe the performance of layperson from both barangay if they performed the BLS or not performed the BLS, and Z test for a two sample mean to know if there are significance different between the performance of the two barangays.

Results

Table 1. Assessment on stakeholders' perception in Barangay Tumana, Marikina City and Barangay Damayan Quezon City *on Critical Steps of Basic Life Support if it is Needed or Not needed Frequency Distribution Results, July 2017*

	Needed				*Not Needed*			
	Damayan		*Tumana*		*Damayan*		*Tumana*	
	No.	*%*	*Ind*	*%*	*No.*	*%*	*No.*	*%*
1. Check for responsiveness: Taps and shouts, "Are you alright, are you ok?" Scan the chest for movements (5-10 secs.)	54	87.10	46	88.46	8	12.90	6	*11.54*
2. Tell someone to activate the Emergency Medical System and get an AED.	*58*	*93.55*	*52*	*100.00*	*4*	*6.45*	0	*0.00*
3. Checks carotid pulse (min. 5 sec; Maximum 10 secs.)	*58*	*93.55*	*52*	*100.00*	*4*	*6.45*	0	*0.00*
4. Bares patient's chest and locate CPR hand position.	*48*	*77.42*	*38*	*73.08*	*14*	*22.58*	14	*26.92*
5. Delivers first cycle of compressions at correct rate (acceptable: 18 seconds or less for 30 compressions)	*56*	*90.32*	*46*	*88.46*	*6*	*9.68*	6	*11.54*
6. Give 2 breaths (1 second each)	*47*	*75.81*	*49*	*94.23*	*15*	*24.19*	3	*5.77*
AED Arrives								
7. Turns AED on, Select proper pads, and place pads correctly.	*50*	*80.65*	*47*	*90.38*	*12*	*19.35*	5	*9.62*
8. Clear patient to analyze (must be visible and verbal check)	*53*	*85.48*	*47*	*90.38*	*9*	*14.52*	5	*9.62*
9. Clear patient to shock/presses shock button (must be visible and verbal check; maximum time from AED arrival less than 45 secs.	*44*	*70.97*	*45*	*86.54*	*18*	*29.03*	7	*13.46*
10. Delivers second cycle of compressions at correct hand position (acceptable greater than 23 to 30 compressions)	*48*	*77.42*	*46*	*88.46*	*14*	*22.58*	6	*11.54*
11. Gives two breaths (1 second each) with visible chest rise.	*46*	*74.19*	*47*	*90.38*	*16*	*25.81*	*5*	*9.62*
12. Delivers third cycle of compressions of adequate depth with complete chest recoil (acceptable; greater than 23 compressions)	*46*	*74.19*	*46*	*88.46*	*16*	*25.81*	*6*	*11.54*

13. *Assess the victim's breathing and pulse after 2 minutes*	*53*	*85.48*	*48*	*92.31*	*9*	*14.52*	*4*	*7.69*
	50.85	*82.01*	*25.08*	*90.09*	*7.23*	*17.99*	*2.92*	*9.91*

Barangay Damayan n= 62 Barangay Tumana n= 52

From the results shown above in table 1, the mean for the parameter on BLS Perception if it is needed or not needed was 82.01 percent for Barangay Damayan and 90.09 percent for Barangay Tumana. Among the procedures perceived the most "needed" in Barangay Damayan were procedure 2, (*Tell someone to activate the Emergency Medical System and get an AED) and procedure 3 (Checks carotid pulse (min. 5 sec; Maximum 10 secs.)* with both receiving a percentage of 93.55. And followed by procedure number 5, *(Delivers first cycle of compressions at correct rate (acceptable: 18 seconds or less for 30 compressions)* had 90.32 percent.

While the most "needed" perceived in Barangay Tumana were procedure 2, (*Tell someone to activate the Emergency Medical System and get an AED) and procedure 3 (Checks carotid pulse (min. 5 sec; Maximum 10 secs.)* with both receiving a percentage of 100.00. And followed by procedure number 6 (Give 2 breaths (1 second each)) had 94.23.The obvious "not needed" procedures in Barangay Damayan's were procedure 9, (Clear patient to shock/presses shock button (must be visible and verbal check; maximum time from AED arrival less than 45 secs) receiving a percentage of 29.08 and followed by procedure 11, (Gives two breaths (1 second each) with visible chest rise) and procedure 12, (Delivers third cycle of compressions of adequate depth with complete chest recoil (acceptable; greater than 23 compressions)) both shared a percentage of 25.81. While the obvious "not needed" procedures in Barangay Damayan were procedure 4, (Bares patient's chest and locate CPR hand position) receiving 26.92 percent and followed by 4, (Bares patient's chest and locate CPR hand position) had 26.92.

Mainstream of the respondents in Barangay Damayan perceived that BLS Critical Steps are needed in emergency care situation that comprise the 82.01 percent in contrast from 17.99 percent of responses of the respondents perceived critical steps in BLS are not needed. While the Mainstream of the respondents in Barangay Tumana perceived that BLS Critical Steps are needed in emergency care situation that comprise the 90.09 percent in contrast from 9.91 percent of responses of the respondents perceived critical steps in BLS are not needed.Hence both Barangay Damayan and Tumana perceived that Basic Life Support Critical Steps are needed in Community Response to Cardio-Pulmonary Emergencies

Table 2.Performance of layperson in Barangay Tumana, Marikina City and Barangay Damayan Quezon City *on Critical Steps of Basic Life Support Frequency Distribution Results, July 2017*

	Performed				*Not Performed*			
	Damayan		*Tumana*		*Damayan*		*Tumana*	
	No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
1. *Check for responsiveness: Taps and shouts, "Are you alright, are you ok?" Scan the chest for movements (5-10 secs.)*	11	47.83	6	20.69	12	52.17	23	79.31
2. *Tell someone to activate the Emergency Medical System and get an AED.*	8	34.78	15	51.72	15	65.22	14	48.28
3. *Checks carotid pulse (min. 5 sec; Maximum 10 secs.)*	10	43.48	19	65.52	13	56.52	10	34.48
4. *Bares patient's chest and locate CPR hand position.*	2	8.70	1	3.45	21	91.30	28	96.55

5. Delivers first cycle of compressions at correct rate (acceptable: 18 seconds or less for 30 compressions)	11	47.83	21	72.41	12	52.17	8	27.59
6. Give 2 breaths (1 second each)	6	26.09	14	48.28	17	73.91	15	51.72
AED Arrives								
7. Turns AED on, Select proper pads, and place pads correctly.	2	8.70	3	10.34	21	91.30	26	89.66
8. Clear patient to analyze (must be visible and verbal check)	2	8.70	0	0	21	91.30	29	100
9. Clear patient to shock/presses shock button (must be visible and verbal check; maximum time from AED arrival less than 45 secs.	2	8.70	2	6.90	21	91.30	27	93.10
10. Delivers second cycle of compressions at correct hand position (acceptable greater than 23 to 30 compressions)	2	8.70	1	3.45	21	91.30	28	96.55
11. Gives two breaths (1 second each) with visible chest rise.	1	4.35	1	3.45	22	95.65	28	96.55
12. Delivers third cycle of compressions of adequate depth with complete chest recoil (acceptable; greater than 23 compressions)	1	4.35	0	0	22	95.65	29	100
13. Assess the victim's breathing and pulse after 2 minutes	2	8.70	0	0	21	91.30	29	100

Damayan n=23 Tumana n=29

From the results shown above in table 2, the mean for the parameter on BLS Performance if it is performed or not performed with a mean of 20.07 for Barangay Damayan's performance and a mean of 22.02 Barangay Tumana's performance.Among the steps or procedures the most evident in Barangay Damayan were step or procedure 1, (Check for responsiveness: Taps and shouts, "Are you alright, are you ok?" Scan the chest for movements (5-10 secs.)) and 5, (Delivers first cycle of compressions at correct rate (acceptable: 18 seconds or less for 30 compressions) both receiving 47.83 percent and step 3, (Checks carotid pulse (min. 5 sec; Maximum 10 sees.)) had 43.48 percent.The least evident was step or procedure 11, (Gives two breaths (1 second each) with visible chest rise) and 12, (Delivers third cycle of compressions of adequate depth with complete chest recoil (acceptable; greater than 23 compressions) with all receiving of 4.35 percent or almost Damayan's layperson and health workers failed to perform these steps.

Mainstream of the Damayan's respondents did not performed BLS Critical Steps during emergency situation that comprise the 79.93 percent in contrast from 20.07 percent of responses of the respondents performed the critical steps in Basic Life Support. Mainstream of the Tumanas' respondents did not performed BLS Critical Steps during emergency situation that comprise the 77.98 percent in contrast from 22.02 percent of responses of the respondents performed the critical steps in Basic Life Support. Hence that both Barangay Damayan and Tumana's performance on Basic Life Support Critical Steps are inadequate to response to Cardio-Pulmonary Emergencies.

Discussion

Interconnectedness in the community with system of cardiac resuscitation is essential in the improvement of outcome of patient(Mccarthy, et.al., 2018).Basic life support capability in a community is a vital factor when it comes to emergencies situation . Chest compression

simultaneously promote positive ventilation pressure and increase intrathoracic pressure, this will help to enhance risk regurgitation (Ruetzler,2019).Filipino Community is prone to different kinds of emergency situations like typhoon, flood, and even in different kinds of diseases. One of the common disease that cause of death of Filipino is cardiovascular disease (CVD) because of their life style. This problem could hit our home and any individual in the community should know how to deliver the first aid to save life, specially the majority of the respondents in the community are young adult, comprising 28.07 percent of the total respondents. And Most of them are high school graduate with a 52.63 percent of the total responses. Almost of them earned below 7,500 pesos a month that comprised of 70.18 percent of areas selected population. Demographically shows that most of the respondents remained at home are housewife with 38.6 percent and followed by male that has no occupation or work 23.68 percent. Thus it shows that 62.28 percent of the respondents are stayed at home.

This large number stay at home could help the community to deliver the first aids in times of emergencies. It is the reason why the researchers determined the perception of layperson in the community if BLS is needed or not needed because Perception is dictating CPR practices .In this study we used 114 respondents in Barangay Tumana, Marikina City and Barangay Damayan Quezon City to determine the perception in BLS of layperson in the community.
After the researchers determined the perceptions of the respondents on Basic Life Support if it is needed or not needed; the researchers screened the respondents on this study. From 114 respondents it was reduced to 52 respondents. These respondents believed that all 13 critical steps in Basic Life Support are important.

The 52 respondents of this study were subjected to an assessment of their capability in performing the CPR because Assessment of learners' ability to perform effective CPR is critical and a lifesaving skill for bystanders in line with the pre-hospital emergency care system. Previous studies have confirmed that learning bystander CPR can improve OHCA outcomes [8]

This was the second phase that the researchers done in this study; to assess the capability of the layperson in the community. Based on the results Mainstream of the Damayan's respondents did not performed BLS Critical Steps during emergency situation that comprise the 79.93 percent in contrast from 20.07 percent of responses of the respondents performed the critical steps in Basic Life Support. While Mainstream of the Tumanas' respondents did not performed BLS Critical Steps during emergency situation that comprise the 77.98 percent in contrast from 22.02 percent of responses of the respondents performed the critical steps in Basic Life Support.

Statistically, the z-computed value of 0.58 is less than the z-tabular value of 1.96 at 0.05 level of significance, it means that there is no significant difference between the two groups. It implies that the BLS capabilities of Barangay Damayan and Barangay Tumana are both the same.
Since this was the result of the study, the researchers would like to propose to train the layperson in BLS-CPR because training layperson represents one of the most successful strategies for increasing survival from sudden cardiac arrest. This resulted in out-of-hospital survival rates of 49% - 60%. (Paradis, 2007) . And Cardiopulmonary resuscitation (CPR) is first line therapy for sudden, unexpected, cardiac arrest (CA). Layperson are most likely to administer CPR because most CAs occur in the home or in the community.

Conclusion

Community preparedness is essential in responding emergency situation in cardio pulmonary cases. Individual should know to deliver first aid to save life and their capability to perform cardio pulmonary resuscitation. Assessment to patient promotes higher chances of survival until hospital emergency care system arrived. Training for the layperson in BLS-CPR represents one of the most successful strategies for increasing survival from sudden cardiac arrest.

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