Enhancing the Skills of Community First Responders (CFR) as The Frontline for Emergency Assistance Through Simulation Training

Widodo[1], Sumardino[1], Sumardiyono[2], Rendi Editya Darmawan[1]

[1] The school of nursing of the Health Polytechnic of Surakarta
[2] The Public Health of Doctoral Program, UNS, Indonesia
Corresponding author: rendiedityad@gmail.com Cell +6285354557665

ABSTRACT

Background: incidence of emergency case in community increase quickly. The (Community First Responders) CFR competence in implementing emergency algorythm as the first responder out of hospital is very important.

Purpose: to discribe the CFR competence in implementing emergency algorythm after following simulation training.

Methods: pre experimental without control group design with was chosen with the pre and post-test conducted on February 2021 to CFR in Surakarta Central Java, Indonesia. This study used consecutive sample of 222 CFR. The CFR was asked to fulfill questioner before and after following simulation training. Data were analyzed using paired t test.

Results: there are improvements in the 8 basic skills of basic emergency assistance obtained by CFRs after participating in the CFR simulation. The increase in competence is not only in the number of members at a moderate level but also from a moderate level to the highest level.

Conclusion: training through simulation is one of the most effective ways to increase the competence of CFR members so that they have adequate capacity as the frontline for help to minimize the risk of death and disability as long as they have not received definitive care in the hospital.

Keywords:
Community First Responders, emergency rescue competence, simulation training.

BACKGROUND

By the year 2019 the Ministry of Health of Republic of Indonesia has purposed for the health services that can go the community before receiving definitive care from hospital this services called Public Safety Center (PSC). This services completed by the simple call 119, in order to help community get very easy to remember and access. Every city in this nation has provided the services so that hopefully whatever problem especially health problem that commonly occur in the community can be solved quickly. Therefore, the number of death and disability can be reduced. Based on reports from CRED, (2019) it was recorded that in 2019 there were at least 396 natural disasters in EM-DAT which caused the death of at least 11,755 people and affected 95 million

people. In addition, economically, the disaster has also resulted in losses of at least US $ 103 billion worldwide. Asia is the worst affected continent accounting for 40% of disaster events, 45% of deaths and 74% of the total affected. Beside India was the worst hit country by the disaster that resulted at least 20% of the total deaths and 24.5% of the total number of people affected, it also included other countries such as Indonesia. As mentioned by Satrio, (2018) Indonesia is situated in between three tectonic plates that has place Indonesia to at high risk for natural disaster like earthquake, tsunami, eruption, and other geological disaster. The National Disaster Management Agency (BNPB) noted that during 2018 it was estimated that there were at least 2,000 natural disasters in Indonesia. The total number of deaths due to this series of disasters claimed at least 4,000 lives and about 3 million people were displaced (Renaldi & Shelton, 2018). Various series of disasters from these year, including the earthquake and tsunami in the Sunda Strait, the earthquake and tsunami in Sulawesi, the earthquake in Lombok, landslides in Jakarta and other disasters.

This condition has forced all people to able to not only adapt to the environment but also well prepared for unpredictable disaster. In addition, daily emergency may also occur from non-natural disaster like what is happening today, the occurrence of pandemic Covid 19 and other related activities including traffic accident, industrial accident, or other diseases like heart attack, stroke and other possible bed conditions. By the year 2010, WHO, (2013) stated that at least 33.815 were killed due to traffic accident in South East Asia Region (SEAR) with the average of 18,5 death per 100.000 population.

The existence of PSC 119 could not cover all cases and region in the community. In addition the geographical feature, traffic density, unorganized public infrastructure, lack of information to PSC 119 and some other problems still become big obstacles for the PSC to come as quick a possible to the place of emergency. Therefore community has to be ready and well prepare in case emergency occur in their environment. More important is that the presence of Community First Responder (CFR) is crucial to be established (Whittaker, McLennan, & Handmer, 2015). CFRs are community members who are voluntarily called to provide emergency assistance in their local communities, especially before the arrival of an ambulance. Commission, (2007) and Sherwood, (2018) concludes that CFR becomes fundamental in building the emergency respond as the frontline personnel giving first aid before the arrival of the emergency ambulance including PSC 119. Study by Hansen et al., (2015) also strengthen the previous statement that during the study in North Caroline the presence of bystander-initiated CPR and first-responder defibrillation was associated with the greater likelihood of survival (Darmawan, Sujianto, & Rochana, 2018). Therefore the presence of CFR is included in the chain of survival and become the first frontline team (Association, 2015; Cook, 2008; Valenzuela, Roe, Cretin, Spaite, & Larsen, 1997)

OBJECTIVE
Aim of this study is to discribe the CFR competence in implementing emergency algorythm after following simulation training.

METHODS
Pre experimental without control group design with was chosen with the Pre and Post Test. This study involved 222 respondents by consecutive sampling techniques after calculated using Slovin Formula from total number of 524 people. This study was conducted in 2021 to CFR in Surakarta, Central Java, Indonesia. The CFR was asked to fulfill questioner before and after following simulation training. Inclusion criteria used were volunteers who were active in the community activities, be physically fit and agree to fallow simulation training. Simulation training was conducted after pre-test then ended by post-test to evaluate the sample competence achievement. The instrument used was developed by the Indonesian Ministry of Health's Health Crisis Center Recommendations and other up-to-date references relating to daily emergency first aid in the community. The instrument is then tested for validity content from emergency specialists and nurse practitioners in the fields of emergencies and disasters management. Three experts in the field of emergencies were asked to evaluate the validity of the instrument, then after being declared valid, a pilot study was conducted. The results of the Cronbach's Alpha N test showed that the r count was 0.879-0.915. This value is compared with the calculated r value > r table based on a significant test of 0.05, so it can be concluded that the items in the instrument are reliable. Data were analyze using paired t test.

RESULTS
From the total respondents of 222, 77.9% (n=173) were male and the majority of the subject had highest education at Senior High School level 148 (66.7%) respondents. Most of the subjects were also the same age or more than 46 years, 124 (54%) respondents and only 31 (14%) at age less than 30. Of the total respondents, 165 (74.3%) of them had experience providing first aid. Eight basic skills that are often needed in the community are simulated to respondents and the results can be seen in the following table.

For complete information author guidelines please check

http://ejournal.poltekkes-smg.ac.id/ojs/index.php/jnj/about/submissions#authorGuidelines

Table 1. Pre and Post Test for 6 Basic Trauma Rescue (*n*=222)

No	Pre Test			Post Test		
	Scala	Frequency	Percent (%)	Scala	Frequency	Percent (%)
Fist aid for chest trauma						
1	Low	12	5.4	Low	1	0.5
2	Medium	142	64.0	Medium	123	55.4
3	High	68	30.6	High	98	44.1
First aid for abdominal trauma						
1	Low	17	7.7	Low	0	0
2	Medium	177	79.7	Medium	129	58
3	High	28	12.6	High	95	42
First aid for pelvis trauma						
1	Low	0	0	Low	0	0
2	Medium	90	40.5	Medium	64	28.8
3	High	129	59.5	High	158	71.2
First aid for head trauma						
1	Low	0	0	Low	0	0
2	Medium	18	8.1	Medium	0	0
3	High	204	91.9	High	222	100
First aid for blooding						
1	Low	20	9.0	Low	6	2.7
2	Medium	198	89.2	Medium	191	86.0
3	High	4	1.8	High	25	11.3
First aid for muskulo skeletal						
1	Low	20	9.0	Low	6	2.7
2	Medium	198	89.2	Medium	191	86.0
3	High	4	1.8	High	25	11.3
First aid for burn						
1	Low	18	8.1	Low	11	5.0
2	Medium	185	83.3	Medium	137	61.7
3	High	19	8.6	High	74	33.3

As shown in table 1 in the pre-test data, out of the 6 basic aid skills of first aid on trauma cases, most respondents mastered skills at a moderate level such as chest trauma rescue as much as 142 (64%) abdominal trauma of 177 (79.7%), musculoskeletal trauma 198 (89.2%) and burn trauma was 185 (83.3%). There were interesting findings on 2 types of skills with mastery of skills at a low level with zero scores, namely first aid for pelvic trauma and head trauma. However, head trauma first aid skills also found as the highest skill mastery with a score of 204 (91.9%), followed by the second highest skill mastery in the first pelvic trauma relief skills as many as 129 (59.5%) respondents. At the time of the post test, there was 1 skill with low level of skill mastery apart from pelvic trauma and head trauma, namely abdominal trauma, followed by the next lowest

mastery of chest trauma rescue by 1   (0.5%) respondent, musculoskeletal rescue as much as 6 (2.7%) respondents and burn trauma. With a score of 11 (5.0%) respondents.

The statistical output test, it is known that Asymp. sig. (2-tailed) is worth 0,000. Because the value of 0.000 is less than <0.005, it means that there is a difference between pretest and post test of the basic trauma rescue.

DISCUSSION
First aid service schemes and competency standards for rescuers developed especially in countries that have a tendency for disasters or other events that cause emergencies. Phung, Trueman, Togher, Orner, & Siriwardena, (2017) stated that in the agreement, it was found that there was a need for service development in emergency first aid by the first helper to ensure that the first helper felt that he had adequate capacity and was appreciated and received good support. The simulated case scenario is one way to provide provision to CFR. In this way, the CFR not only gets a picture of the emergency case but also can understand the description of the risk or danger that the victim is experiencing and then can understand how to provide correct help. The CFR should be provided with at least basic training on how to perform basic life support and the use of an automatic external defibrillator (Commission, 2007). Furthermore when more and more volunteers are trained, the more first rescuers will be available and ready to help at anytime emergency or health crisis preventing death due to the delay from health personnel coming (IFRC, 2016).

It has become more and more common that women are increasingly contributing to various activities including emergency relief. As the results shown in this study are also similar to those found by Hossain et al., (2020) where 57% (n = 1319) were female and the remainder was 43% (n = 986) male. As also found in the study by Sasson et al., (2013) where 85% of respondents out of a total of 39 are women. In contrast to what was found in research conducted by (Phung et al., 2017) where of the 16 respondents 75% of them were male. Early childhood is very effective in imparting learning experiences through practice or training. as mentioned by Bollig, Wahl, & Svendsen, (2009) from their study that Children under 5 years of age in a kindergarten given the first aid training by the Norwegian Red Cross in 2011 that children at this age can learn and apply the first basic assistance. Integration of first aid into the curriculum during the elementary school needs to be strengthened. With this, each volunteer automatically has basic aid supplies so that when getting further training it will be easier to understand.

The focus group members of the research conducted by (Erenler, Baydin, Tomak, & Kosargelir, 2015) concluded that the aid that should be given priority to the survivor is securing the patient to a safe place, dealing with existing bleeding by using a cloth or clothing to bandage the wound, performing respiratory resuscitation and rescuing the presence of bone fracture if any by stabilizing or splinting using any available and

appropriate plank or wood. In addition, the victim also needs to loosen his clothes so that his breathing is loose and continue with the identification of the victim. Safety of road users is also mentioned in this study, namely by using leaves to warn road users to be careful.

Head trauma is a case of trauma that is often found in the community. With frequent accidents in the community, people are often exposed to relief efforts for survivors. This is also evident in the results of research that indicate the high score of aid scores at a high level indicates that the respondents have experience in performing first aid for head trauma.

CONCLUSION

Training through simulation is one of the most effective ways to increase the competence of CFR members so that they have adequate capacity as the frontline for help to minimize the risk of death and disability as long as they have not received definitive care in the hospital.

REFERENCES

Association, A. H. (2015). *of the 2015 American Heart Association*.

Bollig, G., Wahl, H. A., & Svendsen, M. V. (2009). Primary school children are able to perform basic life-saving first aid measures. *Resuscitation*, Vol. 80, pp. 689–692. https://doi.org/10.1016/j.resuscitation.2009.03.012

Commission, H. (2007). *The role and management of community first responders - Findings from a national survey of NHS ambulance services in England*.

Cook, H. D. J. (2008). *First Aid in The Workplase, 6th E d i t i o n*.

CRED. (2019). *396 11,755*.

Darmawan, R. E., Sujianto, U., & ROchana, N. (2018). Effects of neo automatic code on the accuracy of chest compression depths in cardiac arrest patients. *Hiroshima Journal of Medical Sciences*, *67*.

Erenler, A. K., Baydin, A., Tomak, L., & Kosargelir, M. (2015). Outcomes of cardiopulmonary resuscitation in trauma patients in the emergency department. *Eur Rev For Med Pharmacol Sci*, *19*, 2567–2571.

Hansen, C. M., Kragholm, K., Pearson, D. A., Tyson, C., Monk, L., Myers, B., … Granger, C. B. (2015). Association of bystander and first-responder intervention with survival after out-of-hospital cardiac arrest in North Carolina, 2010-2013. *JAMA - Journal of the American Medical Association*, *314*(3), 255–264. https://doi.org/10.1001/jama.2015.7938

Hossain, M. J., Hossain, M. S., Mayaboti, C. A., Rahman, A. F., Chowdhury, S. M., Mashreky, S. R., & Rahman, A. (2020). Impact of community-based first responder development for the management of drowning casualties in rural areas of Bangladesh. *African Journal of Emergency Medicine*. https://doi.org/10.1016/j.afjem.2020.07.009

IFRC. (2016). Law and first aid: Promoting and protecting life-saving action. *Www.Ifrc.Org*.

Phung, V.-H., Trueman, I., Togher, F., Orner, R., & Siriwardena, A. N. (2017).

Community first responders and responder schemes in the United Kingdom: systematic scoping review. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*, *25*(1), 58. https://doi.org/10.1186/s13049-017-0403-z

Renaldi, E., & Shelton, T. (2018). Thousands killed as Indonesia devastated by nearly 2,000 natural disasters in 2018. *ABC News*.

Sasson, C., Haukoos, J. S., Bond, C., Rabe, M., Colbert, S. H., King, R., … Heisler, M. (2013). Barriers and facilitators to learning and performing cardiopulmonary resuscitation in neighborhoods with low bystander cardiopulmonary resuscitation prevalence and high rates of cardiac arrest in Columbus, OH. *Circulation: Cardiovascular Quality and Outcomes*, *6*(5), 550–558. https://doi.org/10.1161/CIRCOUTCOMES.111.000097

Satrio, T. Y. S. P. A. C. U. I. T. (2018). *Buku saku TANGGAP TANGKAS TANGGUH menghadapi bencana*. https://doi.org/10.1016/j.ccl.2011.03.002

Sherwood, D. (2018). *South Central Ambulance Service Nhs Foundation Trust*.

Valenzuela, T. D., Roe, D. J., Cretin, S., Spaite, D. W., & Larsen, M. P. (1997). Estimating effectiveness of cardiac arrest interventions: A logistic regression survival model. *Circulation*, *96*(10), 3308–3313. https://doi.org/10.1161/01.CIR.96.10.3308

Whittaker, J., McLennan, B., & Handmer, J. (2015). A review of informal volunteerism in emergencies and disasters: Definition, opportunities and challenges. *International Journal of Disaster Risk Reduction*, *13*, 358–368. https://doi.org/10.1016/j.ijdrr.2015.07.010

WHO. (2013). *Status Keselamatan Jalan di WHO Regional Asia Tenggara Tahun 2013*. 1–7.