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COMPARATIVE STUDY OF CARDIO PULMONARY RESUSCITATION (CPR) TRAINING WITH JIGSAW METHOD AND DEMONSTRATION METHOD ON KNOWLEDGE AND SKILL OF CPR IN CORPS VOLUNTARY STIKES BANYUWANGI

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ABSTRACT

Background: Heart disease is one cause of death at all ages because it can be a major cause of cardiac arrest risk. Out of hospital cardiac arrest is twice as large as the in hospital cardiac arrest. Increasing the individual role that exists in the community as a bystander CPR and being able to perform CPR is a recommended solution. However, CPR training on the general public has not been done much because it still has many obstacles. The selection of effective and efficient training methods will facilitate the implementation of CPR training and increase the number of CPR bystander. **Aim**: Identify difference of jigsaw and demonstration to CPR knowledge and skill of Corps Voluntary STIKES Banyuwangi. **Method:** This study use True experiment design with pretest and posttest design with control group design. Used simple random sampling with 48 samples divided into groups of jigsaw and demonstration. Researchers conducted the measurement of knowledge and skills before and after treatment in both groups to know the difference and analyzed using the Mann Whitney test. **Results:**The Wilcoxon test results on the knowledge variables between pretest and posttest scores of jigsaw and demonstration group p = 0.001 (p <0.05). Skill variable between pretest and posttest score the jigsaw and demonstration group had p = 0,001 (p <0,05). While the Mann Whitney test results the knowledge variable between posttest scores of jigsaw group and posttest scores of demonstration group had significant value (p value) = 0,159 (p> 0,05). The skill variable between posttest score of jigsaw group and posttest score of demonstration group had significant value (p value) = 0.720 (p> 0.05). **Conclusion:** CPR training with jigsaw method and demonstration method have an effect on increasing of CPR knowledge and skill at Corps Voluntary STIKES Banyuwangi, but between method of jigsaw and method of demonstration there is not difference to CPR knowledge and skill at Corps Voluntary STIKES Banyuwangi.

KEYWORDS: Knowledge, Skills, CPR, Jigsaw, Demonstration, Corps voluntary.

BACKGROUND

Heart disease is a non-communicable disease that is one cause of death at all ages and a major cause of cardiac arrest risk. Out-of-Hospital Cardiac Arrest (OHCA) is twice as large of the In Hospital Cardiac Arrest (IHCA). Indonesia estimated 30 cases of OHCA incidents every day (MOH, 2006). Wnent et al., (2015) states that delayed reporting and administration of pulmonary cardiac resuscitation (CPR) causes the low survival rate of OHCA survivors.

Indonesia is a developing country that does not have a fixed number of bystander CPR trained and able to perform CPR action well. Laksono et al. (2016) states that students have a large amount of capacity in the community and most of the time it is used to interaction with the community so the big chance of being a first responder in case of OHCA is very high. Particularly in students who are members of the corps voluntary they are often involved in first aid and evacuation activities in emergency conditions (Swasanti & Putra, 2014). The phenomenon that researchers get during interviews with members of corps voluntary STIKES Banyuwangi is 65% of 30 students who become members of corps voluntary have never received CPR training, have less knowledge and most states are still hesitant in doing CPR action despite having received training.

Achievement the competence of training that is not maximal can be caused by learning factors both internal and external. It relates to attention and motivation, liveliness, direct involvement, experience, repetition, challenge, feedback and reinforcement as well as individual differences (Dimyati, 2016).

The results of interviews with members of corps voluntary STIKES Banyuwangi who had received training, They are stated that the first aid training program and basic life support that had been obtained with corps voluntary members used the demonstration method, where the training participants after receiving the direct materials were given a joint practice. The demonstration method is not glued from the verbal explanation by the instructor but the demonstration can present more concrete training materials (Fetherston, 2008). However, this method has several disadvantages, such as the speaker who dominates the training process so the trainees to be passive, if delivered in a long time will lead to boredom, the emergence of other understandings when the attention of participants is less, so with the condition of training objectives to improve the knowledge and skills of participants will not be maximized (Djamarah et al., 2012).

Innovation of CPR training in corps voluntary with active cooperative training methods is needed to minimize any weaknesses in the method of giving, so that participants obtain the knowledge and skills optimally and the long-term outcomes that will be achieved by the participants when volunteering. Herrmann (2013) says that one form of cooperative training is the jigsaw method. Isjoni (2012), said that cooperative training jigsaw is a form of learning activities and practice based on constructivism that makes knowledge and skill attached to human memory.

Hariyati's research (2013) have result 61.9% of participants with active cooperative training methods are more fun, and 49.2% stated more interesting when given with media that use information technology. With the demonstration method of instructional control only on the instructor and by the jigsaw method the involvement of the participants took part in the control of the training. However, the final result of comparison of both teaching methods for CPR training, especially demonstration and jigsaw method in achieving knowledge and skills of CPR in corps voluntary can not be explained and need to conduct further research.

Objectife this research to identify difference of jigsaw and demonstration to CPR knowledge and skill of Corps Voluntary STIKES Banyuwangi.

METHOD

This Research use research designTrue experiment design with pretest and posttest control group design.This research was conducted at STIKES Banyuwangi. The data collecting activity in this research has been done on February until March 2018. Sample counted 48 respondents who joined as member of corps voluntary STIKES Banyuwangi.

Instrument: The instruments used in this research are training module, CPR mannequin, skill observation sheet and questionnaire of knowledge that have been tested for validity and reliability on 20 members of corps voluntary others respondent.

Data Collection and Analysis: The research data was obtained by measuring the knowledge and skills of CPR in the respondents before and after CPR training with jigsaw method and demonstration method with the researcher who assisted one person enumerator.

Respondents were divided into 2 groups, jigsaw and demonstration. Each group prior to receiving CPR training is measured with a CPR knowledge questionnaire and to measure participants' ability to take CPR action as understood.

The jigsaw group is given training by dividing the participants into 6 groups, each group consisting of 4 people and then each group member representing to enter into 4 groups of experts namely group of understanding and indication of CPR, compression group, Ventilation group and CPR evaluation group. In their group of experts studying and practicing the specific material from the training module guide with 30 minutes supervised with the facilitator.

After studying in the expert group each member returns to the original group and each member representing the group of experts will be given an opportunity to explain the material that has been obtained to the members of the group followed by discussion between members for 70 minutes. after the process of discussion and submission of materials by each member they will practice the CPR procedure in a systematic and overall.

The role of the facilitator in the jigsaw group only observes the process of the training and provides answers if there are materials that the participants find difficult.

On the demonstration group the facilitators gave explanations and simulations to the 40-minute training participants, and the participants looked at the explanation and could also look at the training modules already obtained. after getting an explanation each participant is given the opportunity to practice independently on CPR mannequin.

Evaluation of knowledge is done immediately after completion of training and skills are measured 1 week later.

Statistical analysis was performed utilizing SPSS version 16 software. Data analysis using wilcoxon test to know the effect of CPR training with both methods between

pretest score and posttest score of knowledge and skill. While to know the difference of both methods to knowledge and skills of CPR using Mann Whitney test.

Ethical Procedures: Ethical approval has been obtained from the ethics commission of health research at Faculty of Medicine Univesitas Brawijaya Malang.

RESULT

The results recapitulation of study data found at table.1 that the majority of respondents female (91.7%), almost half of them aged 19 years (43.8%), the majority have never found people who are having cardiac arrest (89.3%), most asked the help of people around when finding people who are having cardiac arrest (60%), and almost all do not have family members or relatives who suffer from heart disease (79.2%).

Table 1: Respondent Characteristics.

Variable	N	%
Gender		
Male	4	8,3
Female	44	91,7
Age		
17 years	2	4,2
18 years	18	37,5
19 years	21	43,8
20 years	6	12,5
21 years	1	2,1
Experience finding people who are having cardiac arrest		
Ever	5	10,4
Never	43	89,6
Actions taken when finding people who have cardiac arrest (* for respondents who have ever found)		
Calling ambulance	1	20
Request help people around	3	60
Do not take any action	1	20
Have family / relatives who suffer from heart disease		
Yes	10	20,8
No	38	79,2

Source: Primary data (2018)

Specific Data

1. The result of CPR training using jigsaw method and demonstration method to knowledge Corps Voluntary

Table 2: The result of wilcoxon test differences in the scores of knowledge before and after CPR training.

Group	Knowledge	Mean (SD)	*p*
Jigsaw	Pretest Posttest	53.83(11.001) 81.17 (6.512)	0,001
Demonstrasion	Pretest Posttest	50.33 (7.069) 79.00 (5.688)	0,001

Source: Primary data (2018)

Table 2 shows that result of Wilcoxon test between pretest and posttest score of knowledge have significant value (p value) = 0.001 (p <0.05). It indicates that: 1) There is a difference of knowledge score between before and after CPR training by using jigsaw method. 2) There is a difference of knowledge score between before and after CPR training by using demonstration method.

The results of analysis each knowledge component, it was found that before and after CPR training using jigsaw method and demonstration method, the majority of respondents were able to answer each item of question in the knowledge questionnaire well and seen significant difference on each knowledge component between before and after training with p value <0.05.

1. The result of CPR training using jigsaw method and demonstration method to skill of corps voluntary

Table 3: The result of wilcoxon test differences in the scores of skill before and after CPR training.

Group	Knowledge	Mean (SD)	*p*
Jigsaw	Pretest Posttest	50.00 (7.913) 80.54 (5.225)	0,001
Demonstrasion	Pretest Posttest	50.75 (7.036) 80.04(5.052)	0,001

Source: Primary data (2018)

Based on table 3 it was found that Wilcoxon test results between pretest and posttest skill score had significant value (*p* value) = 0.001 (*p* <0.05). This indicates that, 1) there are differences in skill score between before and after CPR training using jigsaw method, 2) there is difference of skill score between before and after CPR training by using demonstration method.

The result of wilcoxon test analysis on each item of CPR can be explained that between before and after CPR training using jigsaw method and demonstration method, the majority of respondents are able to carry out every stage of CPR procedure that is in the observation sheet well and seen the difference significant at all stages of the procedure in the jigsaw group. In the demonstration group of procedure number 11, there was no significant difference between before and after CPR training with p = 0,083 (p> 0,05).

2. The results of the different jigsaw methods and demonstration methods on knowledge of corps voluntary

Table 4: Differences knowledge and skill scores between Jigsaw and Demonstration.

Competension	Mean (SD)	*p*
Knowledge Jigsaw Demonstrasion	*81,17 (6,51)* *79,00 (5,69)*	*0,159*
Skill Jigsaw Demonstrasion	80,5(5,23) 80,0(5,05)	0,720

Mann Whitney test : *p*<0,05

Result of Independent T test between the pretest score of knowledge (jigsaw group) and pretest knowledge (demonstration group) has significant value (*p* value) = 0.197 (*p*>0.05). This indicates that there is not difference between the pretest knowledge score (jigsaw group) and the pretest knowledge (demonstration group) of CPR training using jigsaw method and the demonstration method.

Result of Mann Whitney test between posttest scores of knowledge (jigsaw group) and posttest knowledge (demonstration group) had significant value *p* = 0,159 (*p*> 0,05). So there are not difference between posttest knowledge score (jigsaw group) and posttest knowledge (demonstration group) of CPR training using jigsaw method and demonstration method.

Table 5 Differences of knowledge items jigsaw and demonstrasion.

Item Knowledge	*Posttest*		*p*
	Jigsaw n (%)	Demonstrasion n (%)	
Definition of CPR	24 (100)	24 (100)	1,000
Indication of CPR	22 (91,7)	21 (87,5)	0,589
Step of CPR	24 (100)	20 (83,3)	0,033
Ventilation	23 (95,8)	23 (95,8)	0,887
Evaluation of CPR	23 (95,8)	23 (95,3)	0,786

Source: Primary data (2018)

Table 5 explains that after attending CPR training with jigsaw method and demonstration method seen most respondents are able to answer each item of question in questionnaire of knowledge well. Knowledge scores after CPR training with the jigsaw method and demonstration methods were no significant differences in the knowledge components of numbers 1, 2, 4, and 5 p> 0.05. While the knowledge component number 3 occurs a significant difference with the value of p <0.05.

3. The results of the different jigsaw methods and demonstration methods on skill of corps voluntary

The result of Independent T test between skill pretest score (jigsaw group) and pretest skill (demonstration group) had significant value p = 0,730 (p> 0,05). This indicates that there is no difference between the pretest skill score (jigsaw group) and the pretest skills (demonstration groups) of CPR training using the jigsaw method and the demonstration method.

Table 6: Differences of skill items jigsaw and demonstrasion.

Item Skill	Posttest		*p*
	J	D	
Assess environmental safety	87,5	87,5	1,000
Assess the victim's response	87,5	83,3	0,686
Assess gasping breathing	91,7	91,7	1,000
Assess the carotid pulse	83,3	91,7	0,388
Assessment <10 seconds	83,3	100	0,039
Call EMS	79,2	91,7	0,225
Hand placement	87,5	91,7	0,640
Body pisition	83,3	79,2	0,714
Rate compression 100-120x	62,5	45,8	0,252
Depth of compression(2inch)	62,5	58,3	0,770
Full recoil	70,8	50,0	0,144
Minimal interupsion	54,2	54,2	1,000
Open air way	83,3	87,5	0,686
Clears breath obstruction	87,5	83,3	0,686
Ventilasi	83,3	87,5	0,686
Evaluation / 5 cycles	91,7	91,7	1,000
Recovery position	91,7	83.3	0,388

Desc: Mann Whitney test *p* <0.05

Mann Whitney test results between posttest skill score (jigsaw group) and skill posttest (demonstration group) had significant value p = 0,720 (p> 0,05). This indicates that there is not difference between posttest skill score (jigsaw group) and posttest skills (demonstration group) of CPR training use jigsaw method and demonstration method.

The analysis of the difference between each stage of CPR between jigsaw and demonstration can be seen in table 7. It is explained that after obtaining CPR training with jigsaw method and demonstration method, most respondents are able to perform each stage of procedure on skill observation sheet well. Almost all skill scores after CPR training with jigsaw method and demonstration method were not significantly different, skill components 1 to 4 and 6 to 17 each had p> 0.05. While at skill component number 5 (assesment < 10 seceonds) there is difference, has p value <0,05.

DISCUSSION

1. The effect of jigsaw method on the knowledge of CPR on corps voluntary STIKES Banyuwangi

Cardio Pulmonary Resuscitation (CPR) training with jigaw method gives a significant effect on the knowledge of CPR on corps voluntary STIKES Banyuwangi. Wilcoxon test results prove it with the value of p = 0.001, which means the value of p <0.05 on the variable knowledge. Score of knowledge on corps voluntary STIKES Banyuwangi who get training CPR with method jigsaw on pretest known mean score (mean) is 53,83 whereas at posttest mean score (mean) is 81,17. From the data, it can be concluded that CPR training with jigsaw method can give improvement of CPR knowledge.

Training is a form of teaching and learning activities conducted by the trainees and facilitated by the facilitator to achieve the objectives of learning that have been specified previously. The jigsaw method is a co-operative training method that centers on trainees divided into small groups so that they can work together, discuss the material in small topics, and communicate in achieving the learning outcomes knowledge of a particular field of knowledge (Kaminski, 2013). Knowledge can be developed by studying a theory (knowing what) (Brykczynski, 2014). Aims in the development of knowledge so that knowledge can survive over time in the practical discipline developed from the method of learning.

The jigsaw method becomes one of the solutions or alternatives in the learning or training process aimed at increasing knowledge (Azmi, 2015). During the training process, all participants were more active in discussing and questioning among the participants. The trainees are given the opportunity to work together to help (teach) their friends to each other so that there is a transfer of knowledge (knowledge transfer) and skills about the procedure of the implementation of CPR action on victims who have cardiac arrest.

Based on the results of the analysis of the ability to answer the knowledge component, it can be explained that the number of respondents' answers on knowledge increased significantly in all subtopics between before and after training CPR with jigsaw method significant value $p < 0.05$. Each topic of knowledge has increased because it is effected by the training process that has been passed. In the process of responding the respondents in distributing training modules, whose contents have covered all the subtopics studied. Therefore, the subtopics that are studied are appropriate to the training objectives.

Implementation of CPR training with jigsaw method is done by dividing the jigsaw group into 4 small groups containing 4 respondents. Then each member of the group is separated into a team of experts who study a particular sub topic. The team of experts has a group of 6 members. This is in accordance with the guidance of Adams (2013) and Chu (2014) theory sources that the implementation of training with the jigsaw method is ideally the number of group members between 4-6 people. As the number of members in one group more and more will reduce the effectiveness of members in cooperation among its members (Adams, 2013, Isjoni, 2011). Therefore, the ideal number of members in CPR training with jisaw method in this study became effective in improving the learning outcomes of corps voluntary STIKES Banyuwangi.

The knowledge of corps voluntary STIKES Banyuwangi was evaluated using a CPR knowledge questionnaire covering 5 components covering the definition of CPR, CPR indications, CPR action steps, ventilation and evaluation of CPR actions. The development of the instrument uses the approach of the 5 components in order to support the change of knowledge level starting from remembering, understanding, applying, and analyzing (Kurniawan, 2016). The use of aspects of knowledge with principles that are still abstract to measure the level of ability to remember and understand. The transfer of abstract knowledge into real experience is an aspect used for the degree of applying. While the aspects of analytical skills to the ability to think as a measure in the level of analysis.

CPR training with jigsaw method is applied because it has a focus of purpose so that participants can learn and give opportunity to others to think in groups (Isjoni, 2011). Some advantages possess this method that makes it to be done. One of the advantages of the jigsaw method is to increase trainee knowledge. This is in accordance with the results of this study that the CPR training with the jigsaw method can improve the knowledge of CPR STIKES Banyuwangi significantly.

Several other research results have supported the results of this study. Namdoi *et al*. (2015) & Rachmawati *et al.* (2013) focuses his research on knowledge, indicating that there are significant increases and differences in scores of knowledge before and after the application of the jigsaw motode. The jigsaw method is effective for changing knowledge and enables learners to receive material well (Buhr et al., 2015). Other studies have also shown that the advantages of the jigsaw method increase knowledge through the highest perceptions of courage in asking and discussing, so that material is gained more, more comprehensible and more effective (Alsa, 2011).

Increased knowledge on respondents is influenced by several factors, one of which is the external factor of information. Notoatmodjo (2010) states that nformation gives effect in the short run that results in an increase in one's knowledge. One's knowledge of things is influenced by the source of information obtained (Aisyan et al., 2012). This is in accordance with the results of this study because the training provided is an effort to provide additional information to members of corps voluntary STIKES Banyuwangi. So the knowledge of corps voluntary STIKES Banyuwangi who get training with jigsaw method increased significantly.

2. The effect of demonstration method on the knowledge of CPR on corps voluntary STIKES Banyuwangi

Cardio Pulmonary Resuscitation (CPR) training with demonstration method gives significant effect on the knowledge of CPR on corps voluntary STIKES Banyuwangi. Wilcoxon test results prove it with the value of $p = 0.001$, which means the value of $p < 0.05$ on the variable knowledge. Score of knowledge on corps voluntary STIKES Banyuwangi who get CPR training with demonstration method on pretest known mean score (mean) is 50,33 whereas at posttest average score (mean)

is 79,00. From the data it can be concluded that the CPR training with demonstration method can significantly increase the knowledge of CPR in corps voluntary STIKES Banyuwangi.

The CPR training with demonstration method in this study was conducted by giving explanation to the training participants on the definition of cardiac arrest, signs of cardiac arrest, understanding CPR, indication of CPR action, CPR procedure, ventilation technique, and evaluation of CPR action by an instructor then demonstrated on CPR mannequins. After getting an explanation then the participants are given the opportunity to independently try the CPR procedure on the CPR mannequins provided.

Based on the results of the analysis of the ability to answer the knowledge component can be explained that the number of respondents' answers on knowledge increased significantly in all subtopics between before and after CPR training with demonstration method p value <0.05. Each topic of knowledge has increased because it is influenced by the training process that has been passed. In the process of responding the respondents in distributing training modules, whose contents have covered all the subtopics studied and get explanations and demonstrations by the structure.

CPR training with demonstration methods can provide hands-on experience for trainees in carrying out CPR actions. The training process describes the actual conditions that the instructor demonstrates, the mentoring process of the instructor and the evaluation of the learning outcomes at the end of the session. Demonstration method is one of the methods that facilitate the structure in conveying information and effective in overcoming the scarcity of referrals that is in accordance with the scope of the training participants (kurniawan, 2016). In essence this method is a process of transfer of knowledge (Tranfer of knowledge) from instructor to trainee (Djamarah & Zain, 2011; Simamora 2010). Information obtained in the respondents will affect the level of knowledge possessed (Notoatmodjo, 2010). This is in accordance with the conditions during the training with the demonstration method, that the main source of information obtained from the instructor and the evaluation results showed an increase in knowledge of CPR on corps voluntary STIKES Banyuwangi.

Physical and psychological conditions (interest, motivation, talent and intelligence) affect a participant's learning process (Djamarah, 2012). Information is conveyed by the instructor to the trainees during the demonstration process and feedback occurs in response to the participant's response (Liestianto, 2015). The ability to follow the learning process of each individual is different, this is because the ability to receive, store and interpret the information obtained depends on various things, including the internal factors of the trainees. So the achievement by using the method of demonstration on corps voluntary STIKES Banyuwangi got a range of values between different participants.

The learning process is the interaction between the internal conditions and the cognitive processes of the participants with the stimulus from the environment. The cognitive process can produce a learning outcome consisting of verbal information, intellectual skills, psychomotor skills, cognitive attitude and strategy (Dimyati & Mudjiono, 2016). The ability of the structures provides a stimulus for participants to capture more information and knowledge (Liestianto, 2015). In accordance with the theory of Dale (2009), that the more the five senses used to receive information the broader the perception of a person to the information obtained, and there will be an abstract shift of perception becomes more concrete. During the training process participants will see, listen and respond to information provided by the instructor so that at the end of the training corps voluntary STIKES Banyuwangi able to process the information into cognitive and psychomotor abilities.

3. Differences of jigsaw method and demonstration method on the knowledge of CPR on corps voluntary STIKES Banyuwangi

Based on result of analysis difference of knowledge of jigsaw group and demonstration known that mean difference of pretest score and posttest of knowledge of CPR on corps voluntary STIKES Banyuwangi who get training CPR by jigsaw method is 27,4. While the difference between pretest and posttest score of CPR knowledge on corps voluntary STIKES Banyuwangi who received CPR training with jigsaw method is 28,7. Mann Whitney test results to see the difference between the two training methods (jigsaw and demonstration) obtained p value = 0.159 (p> 0.05). These results mean that there is no significant difference in the effect of CPR training with the jigsaw method and the demonstration method on the knowledge of CPR on corps voluntary STIKES Banyuwangi.

The results of various studies on the use of the jigsaw method suggest that this method is better at improving cognitive abilities. Research conducted by Rahmawati et al. (2013) states that the jigsaw method is better than traditional methods. However, the results in this study do not show any significant difference to the knowledge change between the jigsaw method and the demonstration. Similar to the results of Hafezlmoghadam's research, et al. (2013) that the method of demonstration in comparison with the discussion method in small groups, showed no significant difference in the scoring scores of the two groups.

Judging from the lack of the jigsaw method, there is no statistically significant cause for the absence of different jigsaw methods and methods of demonstration. However, the possibility of a training process with jigsaw method that is not running optimally. When the

time provided is still left, but the participants have finished their discussion seemed to talk outside the topic studied. This is similar to Adams's (2014) study saying the same thing that trainees can chat during discussions outside the subject matter.

Meanwhile, when viewed from the characteristics of respondents almost part aged 19 years and the majority female sex. The same sex of respondents in both groups can lead to the absence of variation in learning outcomes. Because division of different groups can decrease differences in learning outcomes. Amedu research results (2015) stated the same thing that in training with the method of acceptance jigsaw more in get by men than women. Sex composition that is not much different to make the result of training in the form of knowledge there is no significant difference between the two groups.

Based on the analysis of the differences of each item of jigsaw group knowledge and demonstration, there was largely no significant difference in the knowledge component of the CPR definition, CPR indication, ventilation and CPR evaluation of p> 0,05. While on the knowledge component of CPR stage there is a significant difference with the value of p = 0,033 (p <0,05). These results mean that the jigsaw method is more meaningful in increasing the knowledge of the stages in performing CPR.

In performing a procedure CPR needs to be done in a systematic and sequential because it is a unity of unity that can not be separated and if there is neglected will cause non-optimization results of the action. Knowledge of the CPR phase is correctly obtained in the jigsaw group, during the training process each stage of the procedure will be discussed and discussed by each expert group to enable the participants to be stronger in view of each stage. This is in accordance with Kurniawan's (2015) statement that the advantages of the jigsaw method is to improve the ability of the trainees in understanding each stage of the material procedure being studied.

CPR training with jigsaw method requires participants to take an active role in the training process, in addition to following the training process each participant is also responsible for teaching the material learned to be submitted well to other group members. During the process there will be a process of transfer of scientific information systematically according to the stages of the procedures learned to other group members. According to research conducted Azmi (2013) that learning with jigsaw method facilitate the transfer of knowledge skills and attitudes possessed among trainees.

The training process with the jigsaw method is centered on the participants, making it easier for participants to determine and find problems in the training process. The interaction between group members has a positive impact, the openness to respond to each other's shortcomings. In addition, in group interaction will make it easier for participants to adapt and understand the training materials. Difficulties in solving problems, especially knowledge of the CPR procedure stages, allow to be solved with other group members and if difficulty can confirm to the accompanying instructor. Cooperation and repetition of information within the jigsaw group will strengthen the knowledge information acquired so as to enable participants to recall (Liestianto, 2015).

Although the results of the study did not show any significant differences in the two methods (jigsaw and demonstration), the two methods had a significant effect on the improvement of trainee knowledge. As for things to note is the selection of training methods. The results of this study as a basis for the selection of training methods that can be used. The development of training methods aims to make knowledge last all the time in the discipline of science (Brykczynski, 2014). Therefore, various training methods need to be developed in order to be used with many variations and do not cause saturation to the trainees. Thus, developing training methods can help participants achieve higher levels of knowledge and skills.

4. Effect of jigsaw method on CPR skills on corps voluntary STIKES Banyuwangi.

Cardio Pulmonary Resuscitation (CPR) training with jigsaw method has a significant effect on CPR skills on corps voluntary STIKES Banyuwangi. Wilcoxon test results prove it with the value of p = 0.001 which means the value of p <0.05 on the skill variables. Score of knowledge on corps voluntary STIKES Banyuwangi who get training CPR with jigsaw method on pretest known mean score (mean) is 50,00 while at posttest average score (mean) is 80,54. From the data it can be concluded that CPR training with jigsaw method can provide enhanced CPR skills.

Based on the analysis of the skill stage, it is known that there is an increase of all topics between before and after getting CPR training with jigsaw method p value <0.05. Each skill topic is improved because it is influenced by the training process that has been passed. In the process of responding the respondents in distributing the training module as a material for discussion in each small group, then perform the procedure of CPR procedure according to the sub topic being studied. Upon returning to the group of origin each member of the expert group will deliver their respective sub topics so that it will be a complete theory of the CPR action procedure and each participant will practice on the whole mannequin.

The skill's CPR of corps voluntary STIKES Banyuwangi is evaluated used observation sheet. Skill observation sheets are developed with the perception of perception change approach with a more complex and comprehensive view. So the participants use their ability in a complex and comprehensive in doing CPR skills.

The learning process is a sequence of people acquire certain skills. Everyone has different learning readiness, while skills will be influenced by such readiness (Bastabel, 2012). Increased CPR skills in corps voluntary STIKES Banyuwangi indicate the achievement of the purpose of this research. This is in line with the advantages of the jigsaw method of improving the skills of trainees. Other studies show that the jigsaw method has a positive influence in improving the skills or skills of learners. The results of the study showed significant differences in individual skills and teamwork (Alsa, 2011). Iserbyt and Byra (2013) state that there is a change in skills in basic life provision and proven effective training by using the jigsaw method.

One's skill in doing things is influenced by various factors, such as physical condition, emotional readiness, experience and knowledge. When the study took place, the physical condition of corps voluntary STIKES Banyuwangi was healthy. Healthy physical conditions support the readiness in doing the skills because with a healthy physically generate enough energy to conduct the training process. In addition, one's physical health is related to the ability of self to use cognitive in performing psychomotor skills (Bastabel, 2012).

The emotional readiness factor of the participants is related to the learning motivation they have. From the observation of the participants' activities during the training process, participants looked enthusiastic in the training. And the information obtained in the participants determine the level of ability to perform certain tasks. Because of cognitive ability as a foundation for implementing certain skills. So each of these factors will affect a person in learning to use the skills or abilities that exist within him (Kurniawan, 2016).

5. Effect of demonstration methods on CPR skills in corps voluntary STIKES Banyuwangi

Cardio Pulmonary Resuscitation (CPR) training with demonstration method gives a significan effect on the skills of members of corps voluntary STIKES Banyuwangi. Wilcoxon test results prove it with the value p = 0.001 (p <0.05) on skill variables. Score of knowledge on corps voluntary STIKES Banyuwangi who get CPR training with method of mean value demonstration (mean) pretest score known is 50,75 whereas in posttest average score (mean) is 80,04. From the data, it can be concluded that CPR training with demonstration method can give improvement of CPR skills on corps voluntary STIKES Banyuwangi.

Based on the analysis of the skill stage, it is known that there is an increase of all topics between before and after CPR training with demonstration method p value <0.05 except one sub topic of the return of chest recoil p> 0,05. Each skill topic is improved because it is effected by the training process that has been passed. In the process of responding the respondents in distributing training modules and getting explanations and demonstrations by the structure about the stage of action CPR. Then the trainee is given the opportunity to practice on the mannequin independently.

The training participants follow the training process to improve skills in performing certain practice skills (Brykczynski, 2014). Instructors develop the skills of trainees based on rules or guidelines in providing training (Lyon, 2015) with demonstration methods. Standardized guidelines allow participants to perform skills (Kim & Choi, 2016). Sutton (2013) stated that CPR training accompanied by instructors improves the quality of CPR skills in accordance with an evaluation performed immediately after CPR training on cardiac arrest victims.

The ability of a person in performing a particular skill is influenced by several factors: physical condition, emotional readiness, experience and knowledge. When the respondent follows the process of training the physical condition in good health. A healthy physical condition needs to be prepared by the trainees because in a healthy physical condition will generate enough energy to conduct learning poses (Kurniawan, 2016). In accordance with Bastable's (2012) assertion that a person's health is related to his ability to use his cognitive skills in motor skills.

A person's cognitive ability will greatly affect one's ability to perform certain skills. Cognitive abilities are gained in the learning process and interaction with stimuli from the outside environment of a person's body. In the process of training with demonstration methods, participants will use the senses optimally to receive information conveyed by the structure. Dale (2009) states that the more optimal the senses are used to receive information, the broader a person's perception of the information obtained, and facilitate the occurrence of cognitive shift into psychomotor ability.

Adequate demonstration is one of the factors that influence the outcomes of psychomotor training (George & Doto, 2011). The demonstration by the instructor influences the skill uptake from the trainees. The role of the instructor in this method is very dominant because of the existence of the mannequin only as a means for demonstration of skills. The explanation and stages of the procedure performed by the structure will be a source of knowledge by the participants on the procedure of CPR delivery, with knowledge will make the trainees able to transmit into motor skills.

6. Differences of jigsaw method and demonstration method on CPR Skill's of corps voluntary STIKES Banyuwangi.

Cardio Pulmonary Resuscitation (CPR) training with jigsaw method and demonstration method give significant influence to the skill of corps voluntary STIKES Banyuwangi. the results Wilcoxon test prove it with the *p* value = 0.001 (p value <0.05) on skill variables. While Mann Whitney test results to see the

difference of both training methods (jigsaw and demonstration) obtained *p* value = 0.720 (*p*> 0.05). These results mean that no significant difference on the effect of CPR training with jigsaw method and demonstration method on CPR skills in corps voluntary STIKES Banyuwangi.

Both methods (jigsaw and demonstration) are not significantly different but both methods can improve the skill of corps voluntary STIKES Banyuwangi doing CPR. The results of Hafezlmoghadam et al. (2013) states that when traditional training methods (demonstrations) were compared with small group discussion methods (jigsaw) did not show any significant difference in the value of both test results.The study of hanze & berge (2017) also proves that there is not difference between cooperative methods and traditional methods.

In the jigsaw training process every group members are involved in each other holding the responsibility for achieving the learning objectives. Silberman (2017) states that humans need interaction with others and are equally involved in achieving goals. The involvement of trainees in the group will directly involve them in the learning process and make it easier to obtain the skills needed individually or in groups. In addition, in this method inter-group members will practice each other's CPR procedures and other members correct each step of the procedure. Group involvement in responding to other members when making mistakes while practicing CPR procedures and justifying them and asking the instructor if any material is still difficult to understand. These conditions will streng then the cognitive and psychomotor abilities of trainees in the long term (Liestianto, 2015).

Success in conducting psychomotor training is affected with 5 factors (George & Doto (2011): (a) the ability of learners, (b) inadequate demonstration, (c) inappropriate feedback, (d) affective factors, and participants' perceptions. The ability of respondents in this study is very diverse because participants from different departments are concerned with the cognitive ability of each respondent and the basis of their thinking patterns in analyzing and internalizing the material given, whereas the demonstration conducted with the instructor influences the absorption process of the respondent's skill. This is in accordance with the results of this study that there is a change in skill score of pretest and posttest after being trained with demonstration method.

In the training process with demonstration methods the participants will use their senses in digesting the information conveyed by the structure. Dale (2009) states that the more optimal the senses are used to receive information, the broader a person's perception of the information obtained, and facilitate the occurrence of cognitive shift into psychomotor ability. In addition, effective factors such as anxiety, nervous when practice, lack of confidence and embarrassment also affect psychomotor ability (George & Doto, 2011), on CPR skills. In these conditions the instructors very influential role in increasing the confidence of participants while doing CPR procedure (Sutono, 2015).

Reviewing in table 7 it is known that after obtaining CPR training with the jigsaw method and demonstration method, the majority of respondents are able to perform each stage of procedure on the skill observation sheet well. Almost all skill scores after CPR training with jigsaw method and demonstration method were not significantly different, skill components number 1 to 4 and 6 to 17 each had p> 0.05. While on the skill component of carotid pulse assessment less than 10 seconds has *p* value = 0,039 (p <0,05). The Mann Whitney test result means that the demonstration method is more meaningful in improving the carotid pulse assessment skill less than 10 seconds in corps voluntary STIKES Banyuwangi.

Duration used by respondents in doing CPR for 5 cycles less than 2 minutes. CPR action should be evaluated carotid pulse every 2 minutes with a time lag of no more than 10 seconds (AHA, 2015). The results of this research indicate a difference in skills performing carotid pulse assessment in less than 10 seconds. Minimal interruptions are one component of "High Quality CPR", minimal interruption will optimize chest compression and increase the likelihood of ROSC (AHA, 2015). The interruption in CPR can be caused with several things such as a helper focusing too much on the implementation of secondary tasks, pulse assess and poor skill abilities.

Evaluation of skills in this study was conducted after the participants received training. The lack of confidence, nervousness and anxiety experienced by corps voluntary STIKES Banyuwangi when doing CPR action resulted in a failure and time in doing the longer the action. The ability of participants who have not been maximized in accepting demonstrations has resulted in the inability of participants in performing the procedure of action. Other circumstances cause the weakness of individual capabilities such as situations that require individuals to implement themselves directly and only interact with testers only, so it can cause stress on these respondents. This state of psychological stress leads to an individual's inability to remember the procedure of action given (Liestianto, 2015). Assistance and guidance of the organizers in conducting demonstrations that will make the participants better prepared in taking action CPR (George & Doto, 2011).

LIMITATIONS

Evaluation and measurement level of knowledge and skill in performing CPR demonstration in this research is done in the short term due to time constraint, so it is not known the long-term influence, retention or strength of respondents in maintaining the knowledge and skill of CPR already obtained.

CONCLUSION

Statistically, the training of Cardio Pulmonary Resuscitation (CPR) using jigsaw method and demonstration method is not different, but from the question analysis on each variable it can be seen that the jigsaw method is better in increasing the knowledge about the stage of the implementation of CPR. Whereas on skills to conduct carotid pulse assessment less than 10 seconds better demonstration methods.

RECOMMENDATION

The results from this research can be utilized for the development of knowledge and skills in clinical setting and academic order. Jigsaw methods and demonstration methods can be recommended for educational institutions and clinics that will develop the quality of human resources to be ready help others in emergency situations. This is very important because the death caused by vascular cardiovascular disease in Indonesia is increasing especially in the event of out of hospital cardiac arrest. Indonesia does not yet have a fixed number of bystander CPRs, with increasing numbers of people trained will increase the number of volunteers capable and ready to provide first aid to emergency conditions, especially victims with cardiac arrest.

REFERENCES

1. Adams, F.H. Using Jigsaw technique as an effective way of promoting cooperative learning among primary six pupils in Fijai. *Internasional Journal of education and Practice*, 2013; 1(6): 64-74.
2. Aisyan, S>D>S, Djannah, S.N, & Wardani, Y. The relationship between the socioeconomic status of the family and the perinatal mortality in the work area of Baamang Unit II Sampit Central Kalimantan from January - April 2011. *KES MAS*, 2012; 5(1): 31-40.
3. Alsa, A. The effect of jigsaw learning methods on interpersonal relations skills and group collaboration on psychology faculty students. *JURNAL PSIKOLOGI*, 2011; 37(2): 165-175.
4. Amedu, O.I., *The Effect of Gender Achievement of Students on Biology Using The Jigsaw Method. Journal of Education and Practice*, 2015; 6(17): 176-179.
5. American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science. Adult Basic Life Support. Circulation, 2015; 122: S685-S705.
6. Azmi, S.N. Comparison between learning model of cooperative learning type STAD with conventional learning in order to improve learning result of PAI. Jakarta : UIN Syarif Hidayatulloh, 2015.
7. Bastabel, S.B, *Perawat sebagai pendidik: prinsip-prinsip pengajaran dan pembelajaran*. Jakarta: EGC., 2012.
8. Brykczynski, K.A. Caring, clinical wisdom, and ethics in nursing practice. In M.A. Aligood (Ed.), *Nursing Theorists and their work* (8th ed.). St. Louis: Missouri Elsevier, 2014.
9. Buhr, G.T, Heflin, M.T, White, H.K, & Pinheiro, S.O. Using the jigsaw cooperative learning methode to teach medical student about long-term and postacut care (Abstract). *Journal of the American Medical Directors Association*, 2015; 15(6): Doi: 10.1016/j.jamda.2014.01.015.
10. Chu, S.Y. Aplication of the jigsaw cooperative learning in economics course. *International Journal of Managerial Studies and research*, 2014; 2(10): 166-172.
11. Dale, E. *Audio-visual Methods in Teaching*. New York: Dryden Press, 2009.
12. Djamarah, S.B, & Zain, A. *Teaching and Learning Strategies*. Jakarta: Rineka Cipta, 2012.
13. George, J. H., & Doto, F. X. A simple five-step method for teaching clinical skills. *Family Medicine*, 2011; 33(8): 577–578.
14. Hafezlmoghadam, P, Farahmand, S, Farsi, D, Zare, M, & Abbasi, S. A comparative study of lecture and discussion methods in the education of basic life support and advanced cardiovascular life support for medical students. *Tr J Emerg Med*, 2013; 12(20): 59-63. DOI: 10.5505/1304.7361.2013.15986.
15. Hanze, M, & Berger, R. Cooperative learning, motivational effects, and student characteristics: an experimental study comparing cooperative learning and direct intruction in 12 grade physics classes. *Learning and Intruction*, 2017; 17: 29-41.
16. Herrmann, K.J. The Impact of cooperative learning on student engagement: Result from on an intervention. *Active Learning in Higher Education*, 2013; 14(3): 175-187. doi: 10.1177/1469787413498035.
17. Iserbyt, P, & Byra, M. The design of intructional tolls affect secondary school students' learning of Cardiopulmonary Resuscitation (CPR) in reciprocal peer learning: a randomized controlled trial. *Resuscitation*, 2013; 84: 1591-1595. Doi: http://dx.doi.org/10.1016/j.resuscitation.2013.06.023
18. Isjoni. *Cooperative learning: Mengembangkan kemampuan belajar berkelompok*. Bandung: Alfabeta, 2012a.
19. Kaminski, J. Theory applied to informatics – novice to expert. *CJNI: Canadian Journal of Nursing Informatics*, 2013; 5(4).
20. Kim, K,M, & Choi, JS. Self-perceived competency of infection control nurses based on Benner's framework: a nationwide survey in Korea. *Applien Nursing Research*, 2016; 28: 175-179. Doi: http://dx.doi.org/10.1016/j.apnr.2014.09.010.
21. Lyon, L.J. Development of teaching expertise viewed through the Dreyfus model of skill acquisition. *Journal of the Scholarship of Teaching and learning*, 2015; 15(1): 88-105. DOI: 10.14434/JOSOTL.V15I1.12866.
22. Namdol, N Chauhan, M, Konajia, D, Kandari, H, Rana, J, ... Kumar, M. Student learning outcames in response to lecture method and jigsaw teaching methods. *IOSR Journal of Nursing and Health*

Science, 2015; 4(3): 78-83. Doi: 10.9790/1959-04337883.
23. Notoadmodjo, S. *Promosi Kesehatan dan Perilaku Kesehatan*. Jakarta: Rineka Cipta, 2012.
24. Rachmawati, D, Susmarini, D, & Prastowo, W. The difference impact of health education with jigsaw cooperative model and lecture method toward students' knowledge improvement regarding free sex behavior. *World Academy of Science,, Engineering, and Technology*, 2013; 77: 1544-1547.
25. Sutono, Ratnawati Retty, & Suharsono Tony. Differences in the value of chest compression and ventilation at the heart resuscitation training of nursing undergraduate students with instructor, audiovisual and combination feedback in yogyakarta. *Jurnal Ilmu Keperawatan*, 2015; 3(2): 11.2015.
26. Sutton RM, Niles D, Meaney PA,. Aplenc R., Frech B., Abella B.S., Lengeti EL., Berg R.A., Helfaer M.A., Nadkarni V. "Booster" training: evaluation of instructor-led bedside cardiopulmonary resuscitation skill training and automated corrective feedback to improve cardiopulmonary resuscitation compliance of pediatric basic life support providers during simulated cardiac arrest. *Pediatr Crit Care Med*., 2011; 12(3): e116- e121. doi:10.1097 /PCC. 0b013e3181e91271.
27. Swasanti, N Putra, W.P. *Pedoman Praktis Pertolongan Pertama Pada Kedaruratan* Yogyakarta: Kata Hati, 2014.
28. Simanora, R.H. *Buku Ajar Pendidikan dalam Keperawatan*. Jakarta: EGC, 2009.
29. Kurniawan, D.E. Differences in the affect of ECG Learning lethal arrhythmia jigsaw cooperative model and lecture method to knowledge and interpretation skills in nursing s1 students. (Pascasarjana), Universitas Brawijaya, Malang, 2016.
30. Laksono, B.B. Analysis of the effect of adult pulmonary cardiac resuscitation training on the retention of knowledge and skills of adult pulmonary cardiac resuscitation in the s1 nursing students stikes kendedes malang. (Pascasarjana), Universitas Brawijaya, Malang, 2015.
31. Liestianto J. Comparative study of demonstration learning method and practice-rehearsal pairs towards the achievement of digestive system competence: post surgery wound care at the student of nursing academy of the provincial government of kaltim. Ilmu Keperawatan, Universitas Airlangga, Surabaya, 2015.