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Effect of Integrated Behavior Modification with Learning Media On Motivation to Perform Cardiopulmonary Resuscitation

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Abstract. Cardiac arrest is an emergency condition that is life-threatening if not treated immediately. One of the causes of the increasing death rate among out-of-hospital cardiac arrest (OHCA) victims is the lack of understanding by lay helpers about providing appropriate assistance. This requires an increase in the number of CPR/RJP bystanders in the community. This study aims to determine the effect of behavior modification integrated with learning media on motivation to perform cardiopulmonary resuscitation. This research is quantitative with pre-experimental methods; there were 75 respondents involved. The research results showed that the intervention influenced respondents' motivation to carry out RJP ($p = 0.000$). In conclusion, it is important to increase the knowledge, skills, and motivation of ordinary people to carry out RJP, which can be increased not only through providing information but also by considering interventions to strengthen behavior.

Keywords: Learning Media, Behavior Modification, Motivation, RJP

INTRODUCTION

Cardiac arrest is one of the life-threatening emergency conditions and can result in death if not treated immediately. Out-of-hospital cardiac arrest mostly occurs at home or in certain locations when individuals are doing activities; out-of-hospital cardiac arrest occurs at home and other places while doing activities [1], one of which is in a place far from health workers so that community participation is very important to help prevent and provide assistance to victims who experience emergency conditions. Out-of-Hospital Cardiac Arrest (OHCA), better known as a cardiac arrest that occurs outside the hospital, is a condition that often threatens a person's life. This requires an increase in the number of bystander CPR/RJP in the environment, even though the reality in the field is that this assistance is not easy to do, especially for the general public. The community, especially teenagers, already knows the importance of first aid, but not many have reached the stage of providing it. The first link in the Chain of Survival is the early detection of sudden cardiac arrest (SCA) and the subsequent activation of the emergency response system (EMS). The chance of survival from OHCA can be increased by providing prompt, high-quality bystander cardiopulmonary resuscitation (CPR) following successful detection of SCA, which is the second link [2].

Junior high school students are one of the laypeople who have the potential to become bystanders of CPR. As laypeople, students must have knowledge related to providing basic life support, but it is not enough to just know; laypeople must have the willingness and motivation to perform cardiopulmonary resuscitation. The results of Fitri's research [3] on

the willingness to act in cardiopulmonary resuscitation showed that students reported more willingness to perform CPR on friends (89.58%), closest family members (81.25%), and relatives (77.08%) than other victims. The two main reasons respondents did not want to perform CPR were fear of endangering the victim (68.75%) and fear of legal problems (43.75%). Based on this phenomenon, the researcher intended to find out whether providing educational interventions combined with a behavior modification approach based on learning theory to reinforce desired behavior can increase respondents' motivation to perform CPR.

Basic life support is an emergency response system in provides life-saving measures, which includes recognizing cardiac arrest, providing appropriate cardiopulmonary resuscitation (CPR), and providing defibrillation [4]. Basic life support is designed to restore effective circulation and oxygenation and maintain normal neurological function. Based on several opinions, it is concluded that Basic Life Support (BLS) is an emergency response system in the form of first aid, including providing cardiopulmonary resuscitation (CPR) to victims of cardiac arrest or respiratory arrest, which aims to restore vital organ function, circulation, and oxygenation and maintain neurological function and survival.

Cardiac arrest is a disruption of blood flow due to the inability of the heart to contract effectively. Individuals who experience cardiac arrest are characterized by an impalpable carotid artery pulse, bluish skin (cyanosis) or pale, impaired breathing (gasping, apnea) even to the point of respiratory arrest, and pupils unresponsive to light stimuli, and the individual is unconscious. Cardiac arrest is caused by two factors, intrinsic or extrinsic factors. Intrinsic factors such as cardiovascular disease, namely, heart failure, ventricular fibrillation, and electromechanical dissection. Extrinsic factors include acute anoxia (central/peripheral respiratory arrest, airway obstruction, and inhalation disorders), drug overdose, body acid-base/electrolyte disorders, accidents, and vagal reflexes [4].

The occurrence of respiratory arrest and cardiac arrest outside the hospital requires an increase in the number of bystander CPR in the environment, even though the reality in the field is that this assistance is not easy to do, especially for the general public. The community, especially teenagers, already know the importance of first aid, but not many have reached the stage of assisting. This study is expected to produce a model that is used not only to improve knowledge and attitudes in assisting the general public but is also expected to be able to increase motivation so that the willingness to act in performing cardiopulmonary resuscitation can increase because the intervention that will be used in this study uses a psychotherapy approach based on learning theory to reinforce the desired behavior.

METHODS

This study is a quantitative study with a pre-experimental research design with a pre- and post-test design without a control group with an intervention of providing education using information technology in the form of e-comics, videos, and booklets combined with an approach to psychotherapy, namely behavioral modification therapy, to see the effect of the intervention given on the motivation of respondents in performing cardiopulmonary resuscitation. The sample in this study was 75 junior high school students.

The intervention in this study has gone through an ethical review by the Medical and Health Research Ethics Committee (KEPKK) of the Faculty of Medicine, Sriwijaya University, with certificate number 130-2023 dated July 7, 2023.

RESULTS AND DISCUSSION

The univariate analysis presented in this study consists of the distribution of variables of knowledge about cardiopulmonary resuscitation and motivation to perform cardiopulmonary resuscitation. The data from the univariate analysis are presented in the following graph:

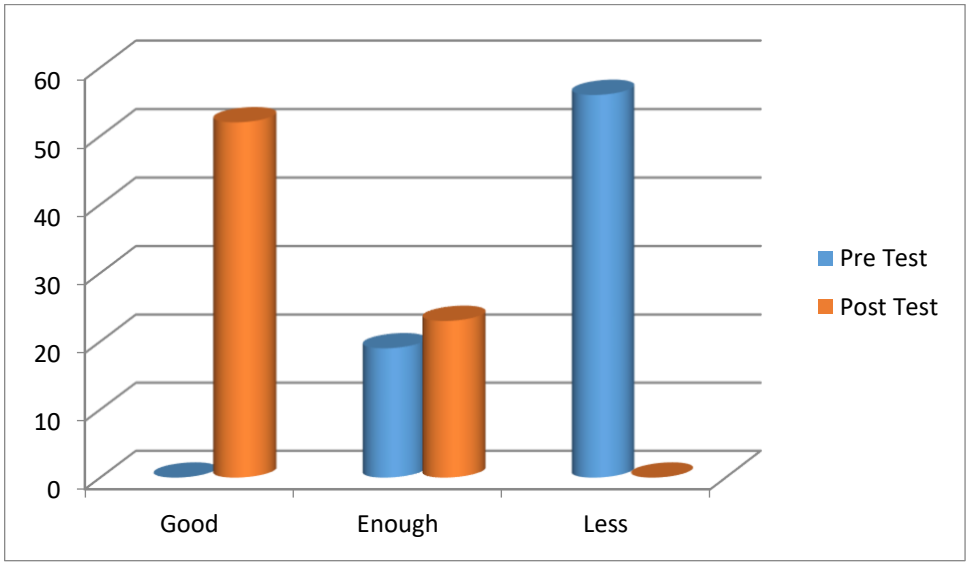

Figure 1. Distribution of Respondents' Knowledge about CPR

Based on Figure 1 regarding the distribution of respondents' knowledge about cardiopulmonary resuscitation, it can be seen that there was an increase; the respondents' knowledge before the intervention was mostly in the poor category (74.7%), and after the intervention, the respondents' knowledge was mostly in the good category (69.3%).

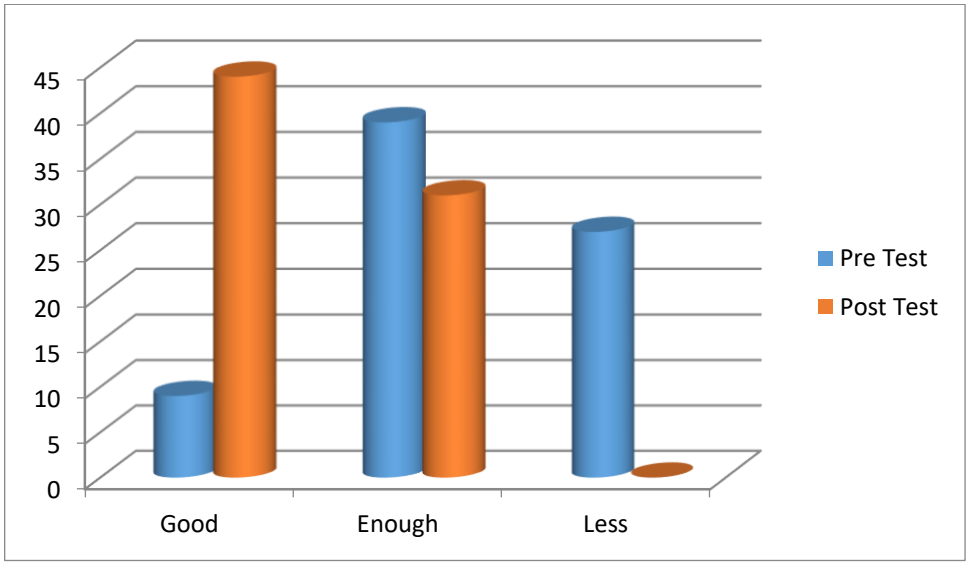

Figure 2. Distribution of Respondents' Motivation in Performing CPR

Based on Figure 2 on the distribution of respondents' motivation in performing cardiopulmonary resuscitation, it can be seen that there was an increase; the motivation of

respondents before the intervention was mostly in the sufficient category (52%), and after the intervention, the motivation of respondents was mostly in the good category (58.7%).

The bivariate analysis presented in this study aims to analyze the differences in respondents' knowledge about cardiopulmonary resuscitation before and after the intervention and to analyze the differences in respondents' motivation before and after the intervention. The data from the bivariate analysis are presented in the following table:

Table 1. Differences in Respondents' Knowledge about CPR Before and After Intervention

		Knowledge After Intervention						**Total**		***p-value***
		Good		Enough		Less				
Knowledge Before Intervention		n	%	n	%	n	%	n	%	0,000
	Good	0	0%	0	0%	0	0%	0	0%	
	Enough	19	25.3%	0	0%	0	0%	19	25.3%	
	Less	33	44%	23	30.7%	0	0%	56	74.7%	
	Total	52	69.3%	23	30.7%	0	0%	75	100%	

Based on table 1, shows that all respondents who know in the less category, as many as 56 people (74.7%), changed to the good category, as many as 33 people (44%), and the sufficient category, as many as 23 people (30.7%), after being given intervention. The results of the data analysis obtained a p-value of 0.000 ($p \leq \alpha$ (0.05)).

Table 2. Differences in Respondents' Motivation to Perform CPR Before and After Intervention

		Motivation After Intervention						**Total**		***p-value***
		Good		Enough		Less				
Motivation Before Intervention		n	%	n	%	n	%	n	%	0,000
	Good	9	12%	0	0%	0	0%	9	12%	
	Enough	25	33.3%	14	18.7%	0	0%	39	52%	
	Less	10	13.3%	17	22.7%	0	0%	27	36%	
	Total	44	58.7%	31	41.3%	0	0%	75	100%	

Based on table 2, shows that respondents who know in the less category as many as 27 people (36%) changed to the good category as many as 10 people (13.3%) and the sufficient category as many as 17 people (22.7%) after being given intervention. The results of the data analysis obtained a p-value of 0.000 ($p \leq \alpha$ (0.05)).

Based on the results of univariate analysis, it is known that there was an increase in knowledge and motivation of respondents before and after the intervention. Before the intervention, most respondents knew cardiopulmonary resuscitation in the category of less (74.7%). Most respondents (88.8%) did not know about the steps to provide basic life support, and respondents did not know how fast to perform cardiopulmonary resuscitation. 85.3% of respondents also did not know the frequency of massage when performing cardiopulmonary resuscitation, and 78.7% of respondents answered the depth incorrectly when performing cardiopulmonary resuscitation. Likewise, with the motivation of respondents, most respondents had less motivation to perform cardiopulmonary resuscitation (74.7%). Many respondents answered questions about the speed, depth, and frequency of cardiopulmonary resuscitation incorrectly, possibly because it was technical and could be known when someone had received previous information. According to Pivač, Gradišek, & Skela-Savič [5], a history of attending training or receiving information related to basic life support has a significant influence on a person's knowledge of the procedure.

Knowledge, experience, and access to information factors may be the cause of this condition; according to the results of the questionnaire, it was found that respondents had never received information or counseling about cardiopulmonary resuscitation and had never seen cardiopulmonary resuscitation on victims so information related to this was limited. One way that can be done to increase knowledge and motivation in performing cardiopulmonary resuscitation on respondents is to provide information through health education. Providing information in health education carried out by researchers can increase respondents' knowledge and motivation about cardiopulmonary resuscitation. Information obtained from health education greatly influences a person's level of knowledge about basic life support.

Knowledge is a sensing activity carried out by a person through the five senses to obtain data, facts, and understanding [6]. A person's knowledge can be influenced by several factors, including age, education, culture, experience, or information [8]. Information is one of the important factors in influencing a person's knowledge [7], as evidenced by the results of the post-test respondents experiencing an increase in knowledge and motivation. More than half of the respondents (69.3%) showed knowledge results in the good category, and the rest (30.7%) knew the sufficient category. Likewise, with motivation, as many as 52 respondents (69.3%) showed motivation in the good category and 23 respondents (30.7%) in the sufficient category.

After the intervention was given, most respondents were able to answer questions about the definition, indications, and steps in performing cardiopulmonary resuscitation correctly. The results of the bivariate analysis also showed a p-value of 0.000, which means that there is an effect of the intervention given on the respondents' knowledge. Most respondents answered strongly agreeing with the statement that cardiopulmonary massage is an important and beneficial action for people in need; respondents also strongly agreed with the statement that respondents feel confident that they can perform cardiopulmonary resuscitation. The bivariate results for motivation showed a p-value of 0.000, which means that there is also an effect of the intervention given on the respondents' motivation to perform cardiopulmonary resuscitation.

Changes in the knowledge and motivation of respondents in this study were influenced by the presence of new information received. Information is one of the factors that influences a person's knowledge [8]. Notoatmodjo explained that the implementation of optimal health education can be influenced by the use of media; the media used in the implementation of health education will make it easier for the audience to capture and remember the information conveyed. The use of interesting educational media will make it easier for someone to process information to increase their knowledge, but providing education requires a strategy in selecting media to be interesting, increasing respondent interest, and the information conveyed is easy to accept [9]. This reason also made researchers choose media in the form of videos, e-comics, and booklets because, according

to researchers, these media are effective and are appropriate for the age category of respondents.

The use of visual media, in addition to increasing curiosity, also makes it easier for respondents to internalize information. As much as 82% of information received by humans is obtained through the sense of sight [10]. Receiving information from media that utilizes the sense of sight greatly influences a person's attention in receiving and absorbing information so that the recipient's knowledge of the information increases. When an individual senses information that is visualized with visual media, the eyes will send a signal to the brain to represent the information [10]. The process of interpreting visual stimuli will be received by the retinal photoreceptors in the eye and then absorbed and converted into electrical signals (visual signals) by the retinal layer [11]. Furthermore, the visual signal is sent to the primary visual cortex of the brain to be represented in a form of spatial understanding.

According to Mulyadi & Katuuk [12], knowledge and motivation levels have a close relationship, which occurs because of the learning process. The learning process can provide knowledge for teenagers so that the more someone learns or knows something, the more motivated the person will be to behave according to what he has learned.

Learning media in the form of video is one of the dynamic electronic media that can be seen and heard in terms of delivering messages. Some of the advantages of audiovisual media in its use during learning and health education are that audiovisual media can provide messages and feedback that can be well received by someone, the use of audiovisual media is very superior in explaining and describing a process so that it can help during activities, and audiovisual media in its application is more realistic or more real and can be repeated or stopped as needed, and audiovisual media can provide a depth of impression that can influence a person's knowledge and attitude when receiving or something through audiovisual media [13]. Mediation Theory explains that the use of media that combines images with a series of words or sentences can increase effectiveness and optimize the brain in processing and remembering information [14].

Behavior can be learned and changed by identifying and manipulating the state of an environment that precedes (antecedent) and follows a behavior (consequence). A behavior is triggered by a series of antecedent events (something that precedes a behavior and is causally connected to the behavior), and then a behavior is followed by consequences (the real results of the behavior that can increase or decrease the likelihood of the behavior being repeated). Consequences can be new activators for triggers or stimulants for the birth of new behavior; for example, giving rewards as a consequence of the initial behavior carried out can be a new activator for someone to carry out similar new behavior [8]. This is what underlies the researcher's assumption that the increase in respondent motivation to perform cardiopulmonary resuscitation is due to the consequences given during the research process.

Consequences are environmental events that follow a behavior, which also strengthen, weaken, or stop a behavior. In general, people tend to repeat behaviors that bring positive results and avoid behaviors that produce negative results. Consequences are defined as the tangible results of an individual's behavior that affect the likelihood that the behavior will occur again. Thus, the frequency of a behavior can be increased or decreased by setting consequences that follow the behavior [8].

Behavior modification is the application of operant conditioning learning theory to change behavior. Assumptions related to behavior modification include: (1) Behavior is something that is learned. (2) Behavior is not permanent but can be trained, taught, and changed or modified. (3) Most behavior is the result of certain stimuli. Behavior does not occur randomly, but because of stimuli. (4) Behavior management programs should be specific to each behavior to be modified. (5) Behavior management programs should focus on the child's environment, not just the child [15].

Integrated behavioral modification with learning media in this study began with the finding of low knowledge in students in assisting victims in need, as well as low concern for helping because students were afraid of making mistakes in taking action and had never received specific information about what to do when finding a victim in this case, a victim who had a cardiac arrest. The next process is to determine the intervention given in several stages. The first stage is to provide intervention in the form of e-comic media and open a discussion session in class, then carry out effective communication and provide positive reinforcement both directly and indirectly through the WhatsApp group. The second stage is to provide media in the form of videos, which are also continued with the provision of positive reinforcement, and the third stage provides media in the form of booklets. This intervention is carried out as an antecedent strategy and a consequence strategy. The expected results are, of course, an increase in knowledge and an improvement in respondent motivation.

Motivation is the drive from within an individual or the environment to act or do something. Motivation is one of the factors supporting behavioral change for the better. A person with high motivation has a high commitment to doing something that is believed to need to be done. One of the factors that can influence motivation is knowledge, which is the entire ability of an individual to think and act in a directed and effective manner, so that the higher the knowledge, the easier it is to absorb information. If a person's knowledge decreases, it will greatly affect the individual's motivation [16]. Therefore, education is very important because it affects the level of individual knowledge of daily life behavior, and accompanied by a good level of knowledge in each individual, this is what will increase motivation, in this case, to assist someone in need.

Motivation is an effort made to influence a person's behavior to be moved to achieve certain results or goals. According to theory, motivation is closely related to needs, one of which is physiological needs. Physiological needs are directly related to human life. If these needs are not met, the individual will not be moved to meet other needs [14]; this is also likely the cause of the small number of bystanders who actively contribute.

According to Fitri [3], her research on Willingness to Act in Cardiopulmonary Resuscitation in High School Students, shows that the relationship with the victim influences the willingness to perform CPR. The results of this study are in line with previous research conducted in China, namely that people are more willing to perform CPR on people who have a more intimate relationship and have a relationship with them. This may be due to the sense of empathy and affection between the rescuer and the victim being helped.

A key component of the theory of planned behavior is the concept of behavioral intention, which is influenced by attitudes about the likelihood that the behavior will have the expected results and subjective evaluations of the risks and benefits of those results. Values, an inner conviction to do good for others, and intrinsic motivation predominated over extrinsic or intrinsic motivation when it came to joining the lay responder system [17]. Research indicates that attitudes, subjective norms, and perceived behavioral control all have a favorable effect on laypeople's readiness to perform CPR while felt risk has a negative effect [18]. This relates to the emergence of motivation, which is the deliberate attempt to change someone's behavior so that his heart is moved to act to accomplish specific outcomes or goals. Motivation can also be defined as a stimulus, desire, driver, or encouragement that causes people to act or behave in a way that is motivating, which is the reason why a behavioral activity emerges [19].

CONCLUSIONS

There is a statistically significant difference in the level of knowledge among respondents before and after the intervention, indicating that the educational program effectively enhanced their understanding of cardiopulmonary resuscitation (CPR). Prior to the intervention, many respondents had limited knowledge of CPR procedures, lacked confidence in their ability to perform it correctly, and were uncertain about when and how to apply the technique in emergency situations. However, after the intervention, which included structured training, hands-on practice, and educational materials, their comprehension and awareness of CPR significantly improved. In addition to knowledge improvement, the intervention also had a positive impact on respondents' motivation to perform CPR. Many participants expressed an increased willingness to take action in real-life situations following the training. This highlights the importance of not only providing theoretical information but also incorporating behavioral reinforcement strategies, such as simulation-based training, role-playing scenarios, and peer support. These elements can help solidify the learned skills, boost confidence, and ensure that individuals are more prepared to respond effectively during cardiac emergencies. By addressing both cognitive and motivational factors, CPR education programs can contribute to a higher rate of bystander intervention, ultimately improving survival outcomes in cases of cardiac arrest.

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