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Self-Efficacy Correlated with Basic Life Support Skills: Cardiopulmonary Resuscitation of Nursing Student

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Abstract

Success in providing basic life support to cardiac arrest patients is influenced by self-efficacy related to readiness and confidence in giving first aid. Students as prospective health workers are required to be able to provide basic life support in emergencies. Limited training and direct experience in providing basic life support causes students' skills and self-efficacy to be less than optimal. This study aimed to identify the relationship between self-efficacy and the ability of cardiopulmonary resuscitation performed by students. A quantitative cross-sectional study was conducted on 107 diploma III nursing students selected using the proportional stratified random sampling technique. Primary data were collected using the General Self-Efficacy Scale questionnaire and basic cardiopulmonary resuscitation skills observation sheets. Hypothesis testing in the form of Spearman correlation was conducted to identify the general objectives of the study. The results of the study showed a mean value of self-efficacy of 36.06 and a mean value of basic life support skills of 89.00. The results of the Spearman test obtained a p-value of 0.0001 with a relationship strength of 0.813. It is concluded that there is a very strong positive relationship between self-efficacy and basic life support skills, which means that higher self-efficacy in performing cardiopulmonary resuscitation is directly proportional to the higher success of implementing basic life support. Researchers hope that nursing students can improve their self-efficacy related to cardiopulmonary resuscitation through regular knowledge refresher activities and basic life support skills training.

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INTRODUCTION

Sudden cardiac arrest is a cardiovascular emergency that can happen to anyone, anytime, and anywhere. This condition does not only occur in old age but also in young age. Often death due to cardiac arrest occurs outside the hospital, this is due to the lack of capacity and ability of the community to provide initial assistance by people around the victim. Often people in the cardiac arrest are reluctant to provide basic life support for fear of doing something wrong and then being sued for their actions (Fatmawati et al., 2020). Most deaths (50%) in cardiovascular system disorders are cardiac arrest (Al-Khatib et al., 2017).

Cardiac arrest is a life-threatening cardiovascular emergency due to the failure of the heart to contract effectively so that normal blood circulation suddenly stops. The majority of cardiac arrest cases occur outside the hospital reaching 72% (Suwarno et al., 2019). Sudden death due to heart disorders accompanied by dysrhythmia (ventricular tachycardia and ventricular fibrillation) will affect the heart pump and its prevalence will increase with age (Smith et al., 2015). Data from the World Health Organization shows that death from cardiovascular disease is estimated at 1 person every 5 seconds. Appropriate initial treatment as basic life support in cases of cardiac arrest is cardiopulmonary resuscitation as soon as possible. Resuscitation techniques must be rapid and appropriate to prevent death (Bakara et al., 2020).

Medical and nursing students need to know about basic life support (Palaguna et al., 2024). Facing emergencies both inside and outside the hospital is something that nursing students may experience, but the majority of nursing students in Indonesia still have low knowledge (Husna et al., 2024). The knowledge of nursing profession students was in the poor category of as many as 65.5% of 64 respondents before receiving basic life support training (Rahmawati et al., 2022) . Majority of nursing students (89.3%) had poor knowledge of basic life (Handayani, 2021).

Improving knowledge, attitudes, and practices of basic life support is important to be given early on during college. The results of a study of 40 nursing student respondents showed that 85% of the study respondents had never participated in basic life support training and 80% of them had poor practices in carrying out basic life support. The skills of students cannot be compared with nurses who are already working, concerning the experience and training that nurses get in the field more than students. This difference will affect how students can perform BLS in cardiac arrest scenarios (Dwitanta & Yusuf, 2023).

The survival rate of cardiac arrest patients is caused by the quality of the resuscitation performed. Based on the studies conducted, the survival rate of patients with cardiac arrest OHCA is 31.1 percent if they receive basic life support as soon as possible (Fandizal et al., 2020). Late reporting and administration of cardiopulmonary resuscitation were the main causes of low patient survival rates (Yasin et al., 2017). Survival depends on prompt cardiopulmonary resuscitation from anyone. If done in the first minutes will increase two or three times the success of life. This is the reason that every rescuer must be able to carry out resuscitation with the best quality (Nurfadilla et al., 2024).

Skills in performing resuscitation should be possessed by everyone to minimize the severity of sequelae. Thus, this skill must be taught to everyone, especially teenagers because they are considered individuals with high curiosity and good memory skills. As a prospective responder in an emergency setting, a student requires coordinated action in the form of a chain of survival as a basis for carrying out resuscitation assistance in cardiac arrest patients (Irfani, 2019).

As a prospective nurse (responder) in an emergency setting, a student requires coordinated action in the form of a chain of survival as a basis for carrying out resuscitation assistance in cardiac arrest patients. The nurse's lack of readiness and confidence in responding to cardiac arrest conditions has an impact on increasing the time of nursing intervention and is directly proportional to the decrease in the patient's chance of survival. Individual reasons for refusing to do resuscitation include fear of being wrong and harming the victim being helped, being physically incapable, fear of

contracting a disease, to initial misperception believing that the individual has died (Ahsan et al., 2019). Issues related to legal protection and legal clarity are among the concerns of first responders in carrying out basic life support (Chen et al., 2017).

Self-efficacy is an individual's belief in their ability to do something to achieve the desired goal. Nursing students need to have high self-efficacy to communicate, carry out nursing skills, develop attitudes in carrying out professional tasks, and commit to their profession. Awareness of high self-ability allows students to achieve their clinical goals and improve their academic abilities and clinical competencies. Students with high self-efficacy are considered able to withstand unexpected obstacles and make the effort to overcome problems in various situations (Harefa et al., 2023).

A study shows that student's readiness to perform basic life support is in the less category at 58.8%. This low readiness is caused by a lack of knowledge about basic life support and a lack of self-efficacy in their abilities. Self-efficacy is needed to increase confidence and trust in applying basic life support actions that are owned (Utariningsih et al., 2022). Another study showed that 87.8% of fresh graduate nursing students had low self-efficacy in carrying out life support (Hermanto et al., 2021). Then, research using the quasi-experimental method on two groups showed the majority of the community's self-efficacy levels in providing first aid for cardiac arrest were in the moderate category (76.6 - 83.3%) before being given an intervention in the form of first aid training (Hidayat et al., 2022). Nurses need to have knowledge, attitude, and belief in their ability (self-efficacy) to handle cardiac arrest. Rescuers with high self-efficacy affect the response time, the timeliness of using a defibrillator, and carrying out quality cardiopulmonary resuscitation so that the outcome of cardiac arrest patients can also improve (Alaryani et al., 2021).

A preliminary study was conducted on 10 fifth-semester students who had studied emergency nursing courses and obtained information about basic life support. The results of the study showed that all students understood the basic concepts and algorithms of basic life support for cardiac arrest patients. However, 8 out of 10 students felt hesitant to provide these actions if they occurred outside the hospital. This was due to concerns about legal aspects and legal protection, as well as nervousness when seen by many people. In addition, 6 people said that they only dared and were confident if basic life support (cardiopulmonary resuscitation) was carried out in the hospital during practice because during the action they were accompanied by expert officers. The description of the phenomenon above provides reasons that researchers feel interested and it is important to study the correlation of self-efficacy and the ability of students' cardiopulmonary resuscitation.

METHODS

A quantitative design research design with a cross-sectional approach was carried out to identify the relationship between self-efficacy and cardiopulmonary resuscitation skills of nursing students. This study was conducted at one of the universities in the city of Cimahi, with the participating respondents being Diploma III nursing students who had received a topic lesson on basic life support for cardiopulmonary resuscitation in the fifth semester and were willing to become respondents. A total of 107 students had been selected through the probability sampling technique with a proportionate stratified random sampling method.

Self-efficacy was assessed by using a standardized questionnaire known as the General Self-efficacy Scale (GSE) which refers to the belief that one's actions are responsible for the success of the outcome. This Questionnaire was developed by Matthias Jerusalem and Ralf Schwarzer in 1981 and has been used in many studies with a sample of hundreds of thousands of participants. GSE contains 10 items designed to assess optimism in overcoming difficult demands in a problem and is available in the Indonesian version. This instrument is a Likert scale type (answer choices from 1 to strongly disagree to 4 strongly agree). So, the range of values generated from filling the research instrument is 10-40.

The results of the Indonesian version of the GSE validity test showed that the 10 items were significantly unidimensional (measuring the overall self-efficacy construct). All items had a t-value >1.96 and contained positive factors so this instrument was considered to be used to examine self-efficacy in various fields such as education, clinical, industry, and organization (Novrianto et al., 2019). The results of validity and reliability tests from other studies also showed that the GSE scale had a validity power index of 0.373 to 0.573 with an alpha reliability coefficient of 0.805. This showed that the GSE scale was considered to have a good level of validity and reliability (Lestari & Hartati, 2016).

Observation sheets and checklists for cardiopulmonary resuscitation procedures were made by researchers based on modifications of the cardiopulmonary resuscitation algorithm socialized by the American Heart Association (2020). This Observation sheet uses the Guttman Scale with a definite value of 1 if it is done and 0 if it is not done. Researchers determined respondents according to predetermined criteria and techniques. During data collection, the researcher gave informed consent by explaining the purpose and description of the study. The selected students were guaranteed confidentiality of identity and asked to fill out a self-efficacy questionnaire followed by an assessment of basic life support skills. The assessment was carried out one by one in a closed room that had been prepared by the research team.

The data was first processed to convert data into information, the steps taken were editing, scoring, processing, and cleaning. Data analysis in this study used univariate and bivariate analysis. The univariate analysis of the main research variables (Self-efficacy and CPR implementation skills) was processed using univariate analysis which aimed to identify the mean value. The bivariate analysis begins with the normality test of the data, which showed that the distribution of data on the self-efficacy variable was not normal, while the distribution of data on the cardiopulmonary skill variable was normal. Based on this condition, a non-parametric hypothesis test was determined using the Spearman test, with a significance level set at p-value <0.05. This study considered the ethical principles of autonomy, informed consent, non-harm, fairness, and privacy. Research ethics approval has been granted by the research site based on the provisions and considerations set by the research site as evidenced by the issuance of a research permit from the Director of the Dustira Hospital Nursing Academy with the number B/439/XII/2021 on December 27, 2021.

RESULTS

The results of data processing collected using instruments regarding the characteristics of research respondents distributed to 107 respondents can be seen in the following table:

Table 1. Frequency Distribution of Characteristics Students of Diploma III Nursing Program

Respondent Characteristics	Frequency (*f*)	Percentage (%)
Respondent's Age		
Late Teens	64	59.8
Early Adulthood	43	40.2
Total	**107**	**100**
Gender		
Female	82	76.6
Male	25	23.4
Total	**107**	**100**

Source: *Primary Data*

Table 1 shows the characteristics of the participants who became respondents. Of the 107 respondents, more than half of the respondents were in their late teens (59.8%) with female gender (76.6%). To avoid bias in the results of the study due to other confounding factors, in accordance with the explanation of participant characteristics in the methods section, the researcher has tried to select participants with the same level of education (semester), namely semester five, as well as the level of knowledge that is also expected to be the same because they have received classroom material on basic life support and cardiopulmonary resuscitation before participating in the study.

Furthermore, the following researchers show the results of data processing for the main variable, namely self-efficacy using the general self-efficacy instrument to 107 respondents which can be seen in the following table:

Table 2. Value of Self-Efficacy and Basic Life Support Skills in Diploma III Nursing Students

Variable	Mean	Median	S. D	Minimum - Maximum	95% CI
Self -efficacy	36.06	37.00	3.945	26 - 40	35.30 – 36.81
Basic Life Support Skill	88.92	89.00	5.85	75 - 100	87.79 – 90.04

Source: *Primary Data*

Table 2 shows the respondent's average self-efficacy is 36.06, with a median of 37.00, With a standard deviation of 3.945. the lowest self-efficacy was 26 and the highest self-efficacy was 40. From the interval estimation, it was concluded that 95% believe that the average self-efficacy of the respondents was between 35.30 to 36.81. Table 2 also shows the average results of the observation checklist on the skills to implement the basic life support algorithm of respondents 88.92, median 89.00, with a standard deviation of 5.85. the results of the implementation of the lowest basic life support algorithm are 75 and the highest is 100. From the interval estimation, it is concluded that 95% believe that the average ability to implement the basic life support algorithm of respondents is between 87.79 to 90.04.

The results of hypothesis testing on the self-efficacy variable and the ability to carry out basic life support carried out using the *Spearman Test* to Assess the correlation between the two variables can be seen in the following Table 3.

Table 3. The Correlation of Self-efficacy with Skills in Implementing Basic Life Support for Diploma III Nursing Students

		Basic Life Support Skills
Self-Efficacy	r	0.813
	p	0.000
	n	107

Source: *Primary Data*

The results of the Spearman statistical test showed that H0 was rejected, meaning that there was a correlation between self-efficacy and basic life support skills with a p-value of 0.0001. In addition, a correlation coefficient value of 0.813 is obtained which shows the strength of a very strong correlation in a positive direction. This means that the higher the person's self-efficacy will be directly related to the higher a person's skills in carrying out basic life support during first aid.

DISCUSSION

Nursing students are an inseparable part of the community and are also responsible for an emergency problem so knowledge and skills in carrying out basic life support must be mastered properly. Based on the result of the checklist observations on the skills to implement the basic life support algorithm, the respondents in this study showed a mean value of 88.92 with a median value of 89.00, the lowest value was 75 and the highest

was 100. This indicates that the respondents have been able to carry out basic life support measures very well. This can be influenced by several factors, such as the implementation of various programs for students to improve skills in carrying out basic life support, including obtaining material during the introduction to campus life, the integration of basic life support topics into learning outcomes as well as various material refreshing activities and simulations regarding basic life support for patients with cardiac arrest.

The effect of increasing knowledge through various self-development activities in carrying out basic life support is certainly in line with the research results of a study which shows the mean of basic life support for respondents is 47.20 with 64% of them in the category of lack of knowledge, and then increasing to 66.53 with 44% of them being in the good knowledge category after being given health education regarding basic life support (Prayitno et al., 2020). The survival rate of cardiac arrest patients is due to the quality of cardiopulmonary resuscitation performed. Research results show that resuscitation procedures that follow applicable guidelines are only able to meet circulation to the heart by around 10-30% and to the brain by 30-40%. This underlies that every rescuer must be able to carry out resuscitation actions with the best quality (Ferianto et al., 2016).

The solution that can be done as the right step to improve the quality of cardiopulmonary resuscitation implementation is to improve the knowledge and motivation of nursing students. By increasing knowledge and motivation, it is expected to increase individual courage in carrying out cardiopulmonary resuscitation. Based on the results of the study, the average change in student knowledge was obtained from 64.25 to 87.50 and motivation from 65 to 85 after being assisted with cardiopulmonary resuscitation training (Purwacaraka et al., 2023).

The development of technology in the modern world has an impact on various choices of education and learning models. One of the strategies in innovative learning models is the use of audio-visual. The results of the study showed that learning using videos and simulations was effective in improving understanding and attitudes related to pulmonary resuscitation with a p-value of 0.002 (Simamora et al., 2023). Supported by other studies that show that there is an influence of health education with audio-visual media on the level of knowledge about cardiopulmonary resuscitation (CPR) p-value = 0.0001 (Rosmawarsari et al., 2024).

A good academic climate affects student performance in carrying out their clinical practice. The correlation between academic climate and academic performance was found and mediated by self-efficacy. A person with a good cognitive system has confidence about how he should behave in various situations. This correlation is understood from the perspective that individuals with high self-efficacy can accept challenging tasks, can self-regulate, increase persistence in facing obstacles, and have good anxiety control. A study was conducted with results showing that good self-efficacy in individuals can influence their learning achievement. People who have high confidence in their abilities tend to be successful, while people who have low confidence in their abilities tend to fail (Ningsih & Alimansur, 2019).

The research results in Table 2 also show that the respondent's mean self-efficacy is 36.06 with a median of 37.00, the lowest is 26 and the highest self-efficacy is 40, this shows that the respondents have self-efficacy in carrying out basic life support, in the very good category. This can happen because respondents' knowledge and abilities regarding basic life support skills are very good, so this is directly proportional to the respondents' self-efficacy.

Self-efficacy is considered to have a significant influence on a person's behavior in dealing with problems that are perceived as less controlled. Individuals tend to be ready to act if they think they have competence. This is because self-efficacy increases the development of the number of plans and the persistence of individuals in applying their competence (Syarif & Mastura, 2015). A study showed that there was a significant correlation between the experience (p-value = 0.007) and

awareness (p-value = 0.000) of respondents with the self-efficacy of adolescents in performing cardiopulmonary resuscitation (Yasin et al., 2017).

The development of a person's self-efficacy depends on success, effort, and experience in overcoming various obstacles faced. The experience of facing and overcoming this difficulty of failure becomes the basis for controlling the situation as part of the mastery experience. Nurses' self-efficacy is formed through a learning process and adaptation to an environment with real conditions. Self-efficacy and readiness have a significant positive correlation to early clinical exposure in nursing students. The higher the student's self-efficacy, the higher his readiness to undergo practice in a clinical environment. Students can adapt their role as nurses in a clinical environment to carry out nursing care well, using a nursing process approach, professional attitude, behavior, and professional application skills (Kumalasari et al., 2021).

Spearman's hypothesis test result shows a significant correlation between self-efficacy and the ability to carry out basic life support with a p-value =0.0001 and a correlation coefficient value of 0.813 which indicates a very strong correlation strength in a positive direction. This means that the higher the self-efficacy possessed by a person will be in line with the higher skills of carrying out basic life support when doing first aid. In line with the results of the correlation test conducted in a study, it showed that there was a significant correlation (p-value 0.002) and r 0.229, which showed that there was a correlation between the level of knowledge of basic life support (BLS) and the readiness to perform BLS in nursing students (Utariningsih et al., 2022).

Lack of individual readiness and confidence in responding to emergency conditions can have an impact on increasing intervention time and reducing patient chances of survival. This of course has an impact on work stress and the responsibilities of a nurse. Stressors that arise in the emergency room environment require individuals to have high self-efficacy. Individuals with high self-efficacy can affect the response time, the accuracy of quality CPR procedures, and the use of defibrillators to improve the outcome of cardiac arrest patients (Alaryani et al., 2021). So, resuscitation with high quality and confidence is very important for a rescuer.

CONCLUSION

The test result showed there was a correlation between self-efficacy and skills in carrying out basic life support for cardiopulmonary resuscitation with a very strong correlation strength in a positive direction. This meant that the higher the self-efficacy in carrying out basic life support measures, the higher the skills in carrying out basic life support appropriately.

SUGGESTION

The result of this study is expected to underlie the determination of institutional policies to increase individual self-efficacy to carry out cardiopulmonary resuscitation through refreshing knowledge activities such as seminars, workshops, case discussions, and periodic training on first aid for patients with cardiac arrest. Thus, the basic life support skills possessed by nurses can continue to develop.

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CONFLICTS OF INTEREST

The author declares that there is no conflict of interest in conducting the research until writing this article.

AUTHOR CONTRIBUTIONS

In this study, all authors contributed to conducting the research, starting from the preparation of the proposal, licensing process, data collection and analysis, preparation of the report to writing the article.

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