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Basic life support knowledge among nurses at public health center in rural Banten Province, Indonesia

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Abstract

Background: Public Health Center (PHC) is one of the primary healthcare facilities that has an important role in the chain of survival of out-of-hospital cardiac arrest (OHCA) patients, especially in rural areas. Nurses are an important component of health workers in PHC. Basic Life Support (BLS) knowledgeis the basic component of building a qualified resuscitation.
Purpose: To analyze the relationship between demographic characteristics of PHC's nurses in a rural area and their knowledge about BLS.
Method: An observational analytical study with a cross-sectional approach involved 32 PHC nurses with total sampling techniques. The data was analyzed with the Spearman Rho and Fisher Exact test.
Results: 32 nurses were involved. Most respondents are male (18/56.25%), have a Diploma educational background (23/71.88%), and non-government employees (24/75%). The average age of respondents was 34.75 years, and the average worked for 9.25 years. The level of knowledge of BLS was mostly more than 56% (25/78.1%). The knowledge average was 74.06± 8.93 with a median of 75 anda score range of 50-85. Gender, educational background, BLS certificate upgrades, and employment status were not related to the level of knowledge of BLS. Age and length of work variables have a significant correlation with knowledge. Calculated rs was -0.043 with a p-value of 0.008 (α 0.05) for age and rs value of -0.353 with a p-value of 0.024 (α 0.05) for length of work.
Conclusion: Gender, educational background, BLS certificate upgrades, and employment status were not related to the level of knowledge of BLS.There is a sufficient and significant relationship between the age and length of workwith knowledge of BLS with the opposite direction of the relationship.The older and longer a nurseworks, the lowerthe nurse's knowledge of BLS. Routine BLS training sessions or emergency drills in PHC both online and offline can be some solution in partnership with emergency organizations and nearby referral hospitals.

Keywords: Basic Life Support (BLS); Knowledge; Nurse; Public Health Center (PHC).

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INTRODUCTION

Heart disease is one of the causes of death in the world. An estimated 31% of deaths in the world per year occur due to cardiovascular disease, 80% of them are due to cardiac arrest and stroke. The highest cardiovascular mortality rate occurs in low and middle-income countries (LMICS), especially in Southeast Asian countries (World Health Organization, 2018). The OHCA incidence rate in China in 2020 was 95.7 per 100,000 population, and 79.2% of cardiac arrests occur at home. The survival rate of OHCA in China is 1.2% who survive until discharge or up to 30 days, and only 0.6% who survive up to 12 months (Zheng, Zheng, Zhang, Tan, Ma, Zhu, Li, Han, Yan, Pan, Zhang, Hou, Wang, Bian, Liu, Cheng, Ma, Zheng, & Xu, 2023).

In Indonesia, there is still no data on the incidence or survival rate of OHCA. However, the cardiovascular mortality rate is 35% with a low cardiovascular disease screening rate in primary care facilities, which is 25%. In addition, the World Health Organization (WHO) also reports smoking habits, the number of obesity, and an increase in blood pressure that tends to increase every year (World Health Organization, 2018). This shows that the possibility of cardiac emergencies such as OHCA is quite high with a low survival rate (Onabanjo, IBU, Adeyeye, Akodu, Adaramola, & Popoola, 2023).

Immediate resuscitation in OHCA events is important to increase survival rates to 49-75% (Berlanga-Macías, Barcala-Furelos, Méndez-Seijo, Peixoto-Pino, & Martínez-Isasi, 2023; Prakash, Yadav, & Baghel, 2022). BLS is one of the important components of the resuscitation process (Olasveengen, Mancini, Perkins, Avis, Brooks, Castrén, Chung, Considine, Couper, Escalante, Hatanaka, Hung, Kudenchuk, Lim, Nishiyama, Ristagno, Semeraro, Smith, Smyth, & Rajendran, 2020). Good and quality BLS in cardiac arrest events increases the chances of survival of patients with cardiac arrest (Forouzan, Maleki Verki, Khabazipour, & Ahmadi, 2018; Verplancke, De Paepe, Calle, De Regge, Van Maele, & Monsieurs, 2008). Not only ordinary people, but primary health facility workers are also one of the components of pre-hospital that have an important role in the OHCA chain of survival (Mumpuni, Winarni, & Haedar, 2017).

Primary health facilities such as PHC have their place in the community, especially in developing countries. PHC is a place for treatment that is in demand by the lower middle class. Besides the low cost, it is also because of its location that is easily accessible and spread to remote areas. Not only mild health problems, not infrequently fatal health problems, even cardiac arrest are taken to the PHC to get initial help.

Nurses are health workers who are often the first health workers to identify cardiac arrest patients (Rajeswaran, Cox, Moeng, Tsima, & Tsima, 2018). Although every nurse must always update the BLS certificate, several previous studies have stated that the nurse's BLS performance is still not optimal (Birkeland, 2014; de Ruijter, Biersteker, Biert, van Goor, & Tan, 2014; Ilyas, Shah-e-Zaman, Pradhan, Feroz, Jamal, Amjad, Saghir, Khwaja, Ghauri, & Ahmed, 2014; Park, 2016; Prakash et al., 2022; Rajeswaran et al., 2018). Knowledge is an important thing in performing BLS (Abebe, Zeleke, Assega, Sefefe, & Gebremedhn, 2021; Tadesse, Seid, Getachew, & Ali, 2022). Good knowledge of BLS affects the awareness, confidence, attitude, and quality of a good BLS (Verplancke et al., 2008). Although there have been many studies examining the knowledge of nurses, the knowledge of BLS nurses in primary care facilities has not been explored much (Forouzan et al., 2018; Prakash et al., 2022; Verplancke et al., 2008).

This study aims to analyze the knowledge of PHC nurses about BLS associated with the characteristics of the nurse. The results of this study can be used as a reference to develop BLS training methods in primary health facilities, to improve the quality of BLS, and increase survival rates in OHCA

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cases (Alfaray, Zharfan, Kloping, Annisa, Rezkitha, Faizun, Batsaikhan, Muhajir, Presidiana, Rosyidah, Chasanah, Aini, Fauzy, Musthofa, Firdaos, & Handayani, 2019; Brooks, Simmons, Worthington, Bobrow, & Morrison, 2016; Klacman, Barnes, Wang, & Raymond, 2021; Rose, Pillai, Moreno, Royce, & Lucia, 2023).

RESEARCH METHOD

The study design was an analytical observational study. The research was conducted in May 2023 at one of the PHCs in Banten Province, Indonesia. This study involved 32 PHC nurses with total sampling techniques. The data used in this study was taken from the results of measuring nurses' BLS knowledge using BLS knowledge questionnaires that had been tested for validity and reliability in previous studies (Felayati, 2011). Data on nurse characteristics including age and length of work which became independent variables in this study were taken through secondary data sourced from PHC staffing data. The indicator for assessing respondents' BLS knowledge is based on the results of the answers to the completed questionnaire, namely having knowledge in the poor category if the score is <56%, and good knowledge if the score is ≥56%.

The collected data is then carried out univariate analysis and presented in descriptive tables. The relationship between the independent variable and the dependent variable was analyzed using the Spearman Rho and Fisher Exact test.

This research has received permission and approval from the local Ethics Committee. All respondents were adequately informed about the study and had signed informed consent before data collection. Respondents who decide not to continue the study are not subject to penalties.

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RESEARCH RESULTS

Table 1. Characteristics of Respondents (N=32)

Variable	Results
(Mean±SD) Median (Range)(Years)	(34.75±8.64) 31 (26-59)
Gender (n/%)	
Male	18/56.3
Female	14/43.7
Educational Background (n/%)	
Diploma	23/71.9
Registered Nurse	9/28.1
BLS Training (n/%)	
Upgraded	26/81.2
Not upgraded	6/18.8
Employment Status (n/%)	
Government employee	8/25.0
Non-Government employee	24/75.0
Length of Work (n/%)	
(Mean±SD) Median (Range)(Years)	(9.25±7.92) 6(2-32)
0-5	15/46.9
6-10	8/25.0
>10	9/28.1
BLS Knowledge (n/%)	
(Mean±SD) Median (Range)	(74.06± 8.93)75(50-58)
Poor	7/21.9
Good	25/78.1

Table 1 shows that, of the 32 respondents, the average age was with a mean and standard deviation (34.75 ± 8.64) with an age range of 26-59 years. Most respondents were male (18/56.25%), had a Diploma educational background (23/71.88%), with BLS training upgraded (26/81.2%), non-government employees (24/75%), with an average of 9.25 years of work and good BLS knowledge (25/78.1%), the knowledge average was 74.06± 8.93 with a median of 75 anda score range of 50-85.

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Table 2. Demographic Correlation with BLS Knowledge Level (N=32)

Variable	BLS Knowledge		p-value
	Poor (n=7)	Good (n=25)	
Age (Years) (n/%)			
26-35	5/71.4	18/72	**0.008***
36-45	2/28.6	3/12	
46-55	0/0	3/12	
>55	0/0	1/4	
Gender (n/%)			0.197
Male	2/28.6	16/64	
Female	5/71.4	9/36	
Educational Background (n/%)			0.149
Diploma	7/100	16/64	
Registered Nurse	0/0	9/36	
BLS Training (n/%)			0.101
Upgraded	4/57.2	22/88	
Not upgraded	3/42.8	3/12	
Employment Status (n/%)			0.646
Government employee	1/14.3	7/28	
Non-Government employee	6/85.7	18/72	
Length of Work (Years) (n/%)			**0.024***
0-5	3/42.8	12/48	
6-10	2/28.6	6/24	
>10	2/28.6	7/28	

Based on the calculation of the statistical correlation test between variables, it was found that gender, educational background, BLS certificate upgrades, and employment status were not related to the level of knowledge of BLS. At the same time, the variables of age and length of work have a significant correlation with the level of knowledge. Each with p values of 0.008 and 0.024.

Table 3. Statistical Correlation Test Results of Age and Length of Work with Knowledge (N=32)

Variable	(Mean±SD)	Median (Range)	rs	p-value
Age (year old)	(34.75±8.64)	31 (26-59)	-0.043	0.008
Length of work (years)	(9.25±7.92)	6 (2-32)	-0.353	0.024

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Statistical correlation of age and length of work were calculated using the Spearman Rho test. The results of statistical calculations between age and knowledge level obtained a value of rs of -0.043 with a p-value of 0.008 (α 0.05). This means that there is a significant and opposite correlation between age and level of knowledge. The older a nurse is the lower the nurse's BLS knowledge. Statistical calculations between the length of work and the level of knowledge obtained a value of rs of -0.353 with a p-value of 0.024 (α 0.05). This means that there is a significant and opposite correlation between the length of work and the level of knowledge of nurses. The longer a nurse works at the PHC, the lower the nurse's knowledge about BLS. This correlation can be seen in the scatter plot in Figures 1 and 2.

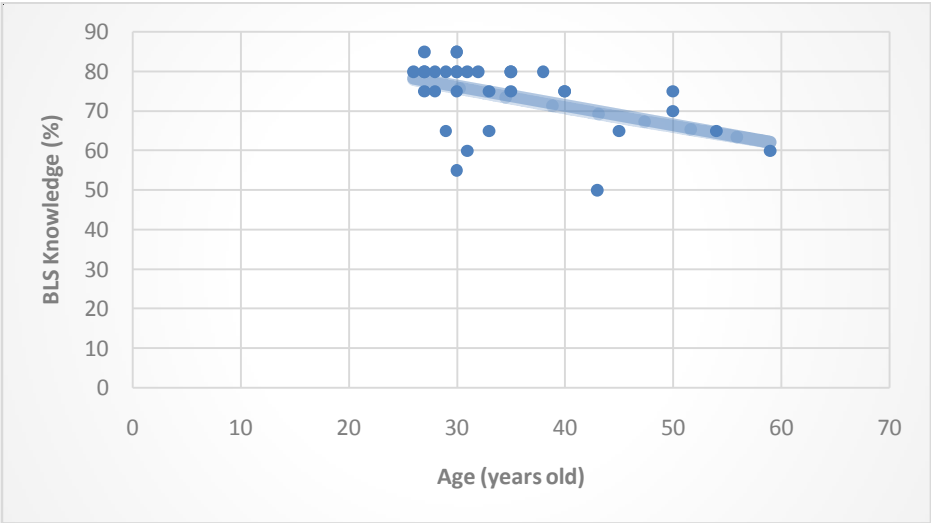

Figure 1. Scatter plotofage and knowledge

Figure 2. Scatter plot of length of work and knowledge

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DISCUSSION

Based on the calculation of the statistical correlation test between variables, it was found that gender, educational background, BLS certificate upgrades, and employment status were not related to the level of knowledge of BLS. This is because most respondents 78.1% showed a level of knowledge ≥56% or good category. This is different from the results of several studies conducted inside the hospital and outside the hospital. In these studies, it is reported that there is a relationship between educational background, upgrade of BLS certificate, and role in BLS knowledge (Onabanjo et al., 2023; Rose et al., 2023). Decreased knowledge and skills were reported at 3 to 6 months after BLS training (Rajeswaran et al., 2018). This is likely why there is no difference between the group of respondents who have renewed their BLS certificates and those who have not renewed them. Rare exposure to cardiac arrest cases and lack of repetition of the material are also contributing factors. This causes no difference in the educational background and role of nurses in PHC with their level of knowledge about BLS (Birkeland, 2014).

The results of statistical calculations show that there is a sufficient and significant relationship between the age of PHC nurses and knowledge of BLS with the opposite direction of the relationship. This means that the higher the age of the PHC nurse, the lower their knowledge about BLS. Conversely, the younger the PHC nurse, the better knowledge of BLS will be. This follows the theorythat several factors affect a person's knowledge, one of which is the fact of age. Age affects a person's comprehension and mindset, the older you get, the more developed your apprehension and mindset. After passing the middle age (40-60 years), one's ability to grasp and mindset will decrease. So after passing the age of 40, the ability of cognition to receive knowledge will regress. As happened in this study, the age range of nurses between 26-53 years found that the older the nurse, the lower knowledge about BLS they have.In addition, based on the results of observations and preliminary research conducted by researchers at PHC, the older a nurse who works at PHC, the more job responsibilities that are programmatic and managerial fields. As a result, medical clinical knowledge is slowly being abandoned, including BLS.

The results of statistical calculations also show that there is a sufficient and significant relationship between the length of work of PHC nurses and knowledge of BLS with the opposite direction of the relationship. This means that the longer the PHC nurse works, the lower her knowledge about BLS will be. This does not follow the theory that states that one of the factors that affect a person's knowledge is his experience working in an institution. The longer a person works in an institution, the more experience a person will have about the job. Experience is a process of obtaining truth knowledge by repeating knowledge that has been obtained in solving problems faced in the past and can be used to obtain knowledge. A person's experience is identical to the length of time a person has been in a field. In the world of work, a person's experience is sometimes measured by the length of the period the person works at an institution (Aty & Blasius, 2021).

PHC is a unique institution. In addition to carrying out curative or clinical medical activities, PHC also carries out other managerial activities such as promotive and preventive activities. A nurse who works at a PHC generally begins with clinical tasks. Over time, those clinical tasks will be supplemented by program tasks, and increasingly they will become managerial tasks. Thus, the experience of PHC nurses in doing BLS cannot be measured based on the length of time a nurse works at the PHC. These findings are in line with those found in studies in health facilities in rural areas. It was reported that the infrequent number of cases led to low knowledge among health workers about BLS (Birkeland,

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2014).This is different from research conducted in hospitals. The longer a nurse is in an emergency department such as an emergency room or ICU, the higher their knowledge of BLS will be (Aty & Blasius, 2021; Rose et al., 2023).

Efforts to increase the knowledge of PHC nurses are one of the important agendas to strengthen the chain of resuscitation success in pre-hospitals. The better the nurse's knowledge of BLS will improve the nurse's ability to perform BLS (Novi, 2019; Pamungkas, Puspitadewi, & Adinata, 2022). Improving the quality of BLS in prehospital carried out by PHC nurses is expected to increase the survival rate of OHCA.

Decreased knowledge and skills within a few months after BLS training, lack of exposure to casesallegedly, and emergency care is not PHC's priority arethe sources of problems at the PHC.Therefore, efforts are needed to increase the retention of BLS knowledge and skills in low-cost PHC. Technology assistance to improve the quality of BLS is also an alternative to improve nurses' knowledge. Routine BLS training sessions or emergency drills in PHC both online and offline can be one solution. Working with emergency organizations and nearby referral hospitals to become local facilitators can help reduce budgets for BLS training (Berg, Bray, Ng, Liley, Greif, Carlson, Morley, Drennan, Smyth, Scholefield, Weiner, Cheng, Djärv, Abelairas-Gómez, Acworth, Andersen, Atkins, Berry, Bhanji, & Wellsford, 2023; Birkeland, 2014; Rose et al., 2023).

There are some limitations to this study. This research was carried out at a single institution, so it cannot be widely generalized.

CONCLUSION

Gender, educational background, BLS certificate upgraded status, and employment status were not related to the level of knowledge of BLS.There is a sufficient and significant relationship between the age and length of workwith knowledge of BLS with the opposite direction of the relationship.The older and longer a nurseworks, the lowerthe nurse's knowledge of BLS.

SUGGESTION

Routine BLS training sessions or emergency drills in PHC both online and offline can be some solution in partnership with emergency organizations and nearby referral hospitals.

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