

# Determinants factors on Public Health Centre nurses' confidence in performing cardiopulmonary resuscitation

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## Determinants factors on Public Health Centre nurses' confidence in performing cardiopulmonary resuscitation

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## Abstract

**Background:** 1 Most cardiac arrests occur outside the hospital (out-of-hospital cardiac arrest/OHCA). Public Health Centre (PHC) nurses are one of the important components of the chain of survival. The confidence of PHC nurses in performing Cardiopulmonary resuscitation (CPR) is still questioned.

**Purpose:** To analyze the factors determining the level of confidence of PHC nurses in performing CPR.

**Method:** An observational analytical study with a cross-sectional approach involving 30 nurses from 2 PHCs in Banten Province, Indonesia taken using a total sampling technique.

**Results:** A total of 30 participants participated in this study. The average age of participants was 36.4 years with an age range between 26-55 years. Most participants were male 17/56.7%, had a diploma education background of 21/70.0%, and had upgraded their BLS training 23/76.7%. On average, participants had worked for 6.5 years and managed 3.4 cases of cardiac arrest (CA) during their time as nurses. It was found that gender, educational background, and BLS training status were not associated with the nurse's level of confidence in performing CPR. While employment status has a significant relationship with confidence in performing. Age has a strong relationship with self-confidence with an r rank value of 0.447. Length of work also showed a relationship with self-confidence with an r-rank value of 0.503. Likewise, the number of CA cases ever managed has a relationship with self-confidence with an r rank of 0.419.

**Conclusion:** Gender, educational background, and BLS training status were not associated with nurses' confidence levels in performing CPR. Employment status, age, length of work, and number of CA cases managed were associated with nurses' confidence in performing CPR.

**Keywords:** Cardiopulmonary Resuscitation; Performance; Public Health Centre; Self-Confidence.

## INTRODUCTION

Most cardiac arrest occurs outside the hospital (OHCA). Management of OHCA patients in the acute phase includes the introduction and activation of an emergency response system, quality

cardiopulmonary resuscitation (CPR), immediate defibrillation, and basic emergency services. The role of lay people and health workers in primary health care facilities becomes very important,

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especially in the phase of cardiac arrest recognition, CPR, and defibrillation until a trained Emergency Medical Service (EMS) team comes to take over the rescue process and take patients to the emergency department (ED) and/or cardiac catheterization laboratory. All of these components are very important links to achieve Return of Spontaneous Circulation (ROSC) (Nolan, Maconochie, Soar, Olasveengen, Greif, Wyckoff, & Hazinski, 2020; Olasveengen, Mancini, Perkins, Avis, Brooks, Casan, & Rajendran, 2020).

Public Health Centre (PHC) is one of the components of primary healthcare facilities closest to the community in Indonesia. Nurses are the backbone of providing first aid at the level of basic health services. As a 24-hour service provider, nurses are required to be able to provide fast and appropriate health services for people who need them, including one of them is assisting in cardiac arrest events (Mamalelala, Dithole, & Maripe-Perera, 2023).

The implementation of the chain of survival in OHCA cases is still not optimal with an unsatisfactory prognosis (Zheng, Zheng, Zhang, Tan, Ma, & Xu, 2023). Therefore, the ability to recognize early cardiac arrest and perform CPR immediately is one of the basic competencies that must be mastered by a nurse (Bielski, Smreka, Chmielewski, Pruc, Chirico, Gasecka, & Szarpak, 2023). The development of the function and role of nurses in PHC, the skills of providing basic life support are increasingly degraded. So even though nurses have adequate knowledge, it does not necessarily make nurses confident enough to do CPR. The nurses feel that they have not been able to carry out nursing care for cardiac arrest patients optimally (Mumpuni, Winami, & Haedar, 2017). This study aims to analyze the factors determining the level of confidence of PHC nurses in performing CPR.

5 RESEARCH METHODS

The research design used was an analytical observational study with a cross-sectional approach. The population of this study were 30 nurses conducted two PHCs of Serang Regency, Banten. The study sample was taken using the total sampling technique. Nurses who were on leave at the time of sampling were excluded from the study.

In this study, the characteristics of participants were collected using questionnaire sheets. The independent variables in this study were age, gender, educational background, BLS (Basic Life Support) training status, employment status, length of employment, and the number of cardiac arrest (CA) cases that have been managed. And the dependent variable in this study was the confidence of nurses in performing CPR was measured using the Self-Confidence Scale. The central objective in the development of the SCS was to evaluate the self-confidence variable, subdivided in four dimensions. The scale consists of a list of 12 items with five-point Likert answers: "not confident", "hardly confident", "confident", "very confident" and "extremely confident".

The different items identify the student's ability to: recognize signs and symptoms of changes in the referred areas, assess the patient precisely, intervene appropriately and assess the effectiveness of the interventions implemented in the respiratory, cardiac and neurological areas (Hicks, Coke, & Li, 2009). The collected data is analyzed by univariate analysis and presented in tabular form. The relationship between nurse characteristics and confidence levels was analyzed using the Spearman Rho and Fisher exact test.

This research received permission and approval from the local independent review board on 17 March 2021 No. 870/166/PKM-TNR/2023. All participants were adequately informed about the study and had signed informed consent before data collection. Participants who decide not to continue the study are not subject to penalties.

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## RESEARCH RESULTS

**Table 1. Characteristics of Participants (N=30)**

Variables	Results
<b>Age (Mean±SD)(Range)Years</b>	(41.1±8.281)(26-55)
<b>Age (n/%)</b>	
26-35	8/26.7
36-45	12/40.0
46-55	10/33.3
<b>Gender (n/%)</b>	
Male	17/56.7
Female	13/43.3
<b>Educational Background (n/%)</b>	
Diploma	21/70.0
Bachelor	9/30.0
<b>BLS Training Status (n/%)</b>	
Not upgraded	7/23.3
Upgraded	23/76.7
<b>Years of Service (n/%)</b>	
0-5	16/53.3
6-10	11/36.7
>10	3/10.0
<b>Number of Managed CA Cases (n/%)</b>	
0	4/13.4
1-5	19/63.3
6-10	6/20.0
>10	1/3.3

The results in table 1 show the age of the participants with mean data of 41.1 and a standard deviation of 8.281 in the age range 26 - 55 years, where those aged 26-35 years were 26.7%, those aged 36-45 years were 40.0%, and those aged 46-55 years were 33.3%. Meanwhile, 56.7% of participants were male and 43.3% were female. Then for the educational background status of participants, 70.0% had a diploma and 30.0% had a bachelor's degree. Furthermore, the BLS training status not upgraded was 23.3% and upgraded was 76.7%.

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Then, for the years of service participants who were 0-5 years was 53.3%, those who were 6-10 years were 36.7%, and those who were >10 were 10.0%. Meanwhile, for the number of cases handled, 13.4% had no cases, 63.3% had handled 1-5 cases, 20.0% had handled 6-10 cases, and 3.3% had handled >10 cases.

**Table 2. Characteristics and Self-Confidence in Performing CPR (N=30)**

Variable	Self-confidence in CPR		r rank	p-value
	Low (n=4)	High (n=26)		
<b>Age (n/%)</b>				
26-35	2/50.0	6/23.0	0.447	0.992
36-45	2/50.0	10/38.5		
46-55	0/0.0	10/38.5		
<b>Gender (n/%)</b>				
Male	2/50.0	15/57.7	1.000	
Female	2/50.0	11/42.3		
<b>Educational Background (n/%)</b>				
Diploma	4/100.0	17/65.4	0.287	
Bachelor	0/0.0	9/34.6		
<b>BLS Training Status (n/%)</b>				
Not upgraded	0/0.0	7/26.9	0.548	
Upgraded	4/100.0	19/73.1		
<b>Years of Service(n/%)</b>				
0-5	4/100.0	12/46.2	0.503	0.966
6-10	0/0.0	11/42.3		
>10	0/0.0	3/11.5		
<b>Number of Managed CA Cases (n/%)</b>				
0	4/100.0	0/0.0	0.419	0.988
1-5	0/0.0	19/73.1		
6-10	0/0.0	6/23.1		
>10	0/0.0	1/3.8		

Based on table 2, the results of the bivariate analysis on the participant's age factor obtained a p-value of 0.992, where in the aged 26-35 years category those who had low confidence in performing CPR were 50.0% and those who had high confidence in performing CPR were 50.0%, while in in the aged 36-45 years category who have low confidence in performing CPR is 50.0% and those who have high confidence in performing CPR are 38.5%, then in the aged 46-55 years category no one has low confidence in performing CPR and have high confidence in performing CPR at 38.5%.

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Furthermore, for the gender factor, participants got a p-value of 1,000, where in the category of men who had low confidence in performing CPR it was 50.0% and those who had high confidence in performing CPR was 57.7%, while in the category of women who had confidence in those who performed low CPR were 50.0% and those who had high confidence in performing CPR were 42.3%.

Furthermore, for the educational background factor, participants got a p-value of 0.287, where in the diploma educational background category those who had low confidence in performing CPR were 100.0% and those who had high confidence in performing CPR were 65.4%, while in the undergraduate educational background category no one had low confidence in performing CPR and those who had high confidence in performing CPR were 34.6%.

Furthermore, for the BLS training status factor, participants got a p-value of 0.584, where in the not upgraded category no one had low confidence in doing CPR and those who had high confidence in doing CPR were 26.9%, while in the upgraded category those who had confidence in doing CPR Low CPR was 100.0% and those who had confidence in performing CPR were high at 73.1%.

Furthermore, for the years of service factor, participants got a p-value of 0.996, where in the 0-5 years category those who had low confidence in performing CPR were 100.0% and those who had high confidence in performing CPR were 46.2%, while in the 6-10 years category no one had low confidence in performing CPR and those who had high confidence in performing CPR were 42.3%, then in the >10 years category no one had low confidence in performing CPR and those who had high confidence in performing CPR were 11.5%.

Furthermore, for the number of managed CA cases factor, participants got a p-value of 0.988, where in the category of never managed CA cases those who had low confidence in performing CPR were 100.0% and no one had high confidence in performing CPR, while in the category of having

handled 1-5 cases, no one had low confidence in performing CPR and those with high confidence in performing CPR were 73.1%, while in the category of having handled 6-10 cases, no one had low confidence in performing CPR and had high confidence in performing CPR at 23.1%, whereas in the category of having handled >10 cases, no one had low confidence in performing CPR and those who had high confidence in performing CPR were 3.8%

## DISCUSSION

In this study, mostly of nurses felt confident to perform CPR. This is in contrast to other studies that say that health workers in the community have low knowledge and confidence in performing CPR (Martins, Brandão, Araújo, Albano, Ávila, Neto, & Barros, 2021). Confidence when performing CPR is related to the quality of ventilation and chest impressions, and ultimately to the quality of CPR (Verplancke, De Paepe, Calle, De Rego, Van Maele, & Monsieurs, 2008). Conversely, lack of exercise and inability to manage emergencies can lead to adverse events and even legal consequences (Prakash, Yadav, & Baghel, 2022).

The development of the function and role of nurses in PHC, the skills of providing basic life support are increasingly degraded. So even though you have adequate knowledge, it does not necessarily make nurses confident enough to do CPR. The nurses feel that they have not been able to carry out nursing care for cardiac arrest patients optimally. PHC nurses try to penetrate all their dependencies to be able to provide professional services in cardiac arrest cases they face at the PHC (Mumpuni, Winami, & Haedar, 2017).

Statistical analysis in this study showed that gender, educational background, and BLS training status were not associated with the level of confidence nurses performed CPR. Employment status, age, length of work, and number of CA cases ever managed were associated with nurses' confidence in performing CPR. Confidence in

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performing CPR is important to initiate CPR in cases of cardiac arrest (Bielski et al., 2023). The speed at which nurses respond to cardiac arrest by initiating CPR is one of the determining factors for the success of CPR. Basic life support given in 3-5 minutes can increase the survival rate by 49-75% (Prakash et al., 2022).

A person's confidence in performing CPR. However, the study did not find a significant relationship between sex and confidence in performing CPR. This is possible because generally, male participants in this study are employees who have worked less than 5 years and have lower self-confidence than participants who have worked longer and are exposed to cardiac arrest cases.

In this study, BLS training status<sup>9</sup> was not related to confidence in performing CPR. The retention of knowledge and skills of BLS training will only last for 3-6 months. Therefore, continuous BLS courses and Education every 6 months are highly recommended (Forouzan, Verki, Khabazipour, & Ahmadi, 2018; Moretti, Camboim, Ferrandez, Ramos, Costa, Canonaco, & Chagas, 2021; Rajeswaran, Cox, Moeng, & Tsima, 2018). While in Indonesia the BLS certificate is upgraded every 2 years. In this study, the upgrade status of BLS training was seen over 2 years, not examining the last date of attending training. BLS knowledge and skills will decline more and more every 1 year, and only last about 5% in the second year (De Ruijter, Biersteker, Biert, Van Goor, & Tan, 2014).

Education level was not related to confidence in performing CPR. The higher a person's level of education, the more confidence will increase (Rose, Pillai, Moreno, Royce, & Lucia, 2023). This is possible because generally, nurses with undergraduate education levels are nurses who work for under 5 years. While most of the more senior nurses have a diploma Education background. So, despite having a lower educational background, senior nurses have higher confidence than nurses with undergraduate backgrounds who still have no experience managing cardiac arrest cases.

In general, a person's social status affects his self-confidence. This is by the results of this study that the employment status of a nurse also affects her confidence in performing CPR. The strata in the work environment affect confidence in resuscitation (Rose et al., 2023).

In this study, it was also found that age is related to self-confidence. This is also in line with other research that states that age is related to skills and confidence in managing cases of cardiac arrest (Rose et al., 2023). The older nurses will increase their experience in dealing with various emergency cases. This will make a nurse more confident in dealing with various situations in her work environment including cardiac arrest. However, the performance of nurses in managing cardiac arrest cases must also be examined in future studies.

In this researchers also used the number of cardiac arrest cases that had been managed to describe the experience of PHC nurses in dealing with cardiac arrest cases. Experience managing cardiac arrest cases plays an important role in boosting nurses' confidence. This experience was gained among others from training and often doing CPR (Aty, & Blasius, 2021; Rose et al., 2023). In general, in hospitals, it turns out that the length of time nurses work at Community Health Centers does not represent their experience and knowledge in the field of CPR. This is because the division of tasks and clinical authority in the Community Health Center emergency room is mostly handed over to young nurses. In contrast, long-term nurses are assigned more managerial and public health program duties than clinical duties.

In this study, it was found that in addition to the length of work, it turned out that the cases that had been managed also affected the confidence of nurses in performing CPR. The longer a nurse works, the more experience she will have in managing various cases. Although it is not always long to work describing the large number of cardiac arrest cases that have been treated, the longer a nurse works will build her confidence in facing

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various kinds of difficult circumstances, such as cardiac arrest. Some studies also mention that almost half of newly graduated nurses have low confidence in performing CPR (Tadesse, Seid, Getachew, & Ali, 2022). This also explains why nurses who have just worked have low self-confidence.

Unique facts about nurses' bad experiences in managing cardiac arrest can also have an impact on decreasing self-confidence. The study results of previous research explain that the nurse's experience of failure to perform CPR can lead to frustration, anger, feelings of guilt, hopelessness, and feelings of unprofessionalism. These feelings can result in nurses subconsciously doubting their expected role and trying to avoid or minimize their involvement in emergencies for which they are responsible (Cole, & Crichton, 2006; Mumpuni, Winarni, & Haedar, 2017). This means that bad experiences such as failure to perform resuscitation can also potentially reduce confidence in performing CPR. However, most cases of cardiac arrest that occur outside hospitals eventually die (Zheng, Zheng, Zhang, Tan, Ma, & Xu, 2023). Therefore, in addition to enriching the experience of managing cardiac arrest through training and in real life, efforts are also needed to change the perception of PHC nurses that the death of victims after good resuscitation efforts is not a failure.

#### Building CPR Confidence Strategies

Having confidence in performing CPR in PHC nurses is important. Several strategies can be used to build and maintain PHC nurse confidence. The need for simulation with real-time feedback is one of the strategies that can be done (Barbosa, Bias, Agostinho, Oberg, Lopes, & Sousa, 2019; Demirtas, Basak, Sahin, & Sonkaya, 2022; Demirtas, Guvenc, Aslan, Unver, Basak, & Kaya, 2021; Dick-Smith, Elliott, Martinez-Maldonado, & Power, 2020; Mather, & McCarthy, 2021; Moon, & Hyun, 2019). Simulations that are carried out regularly in various settings in PHC situations can not only increase the

retention of knowledge and skills but can also build confidence when the actual simulation occurs. In addition, it can also predict shortcomings that may be faced and can prepare steps to overcome them (Ilyas, Shah-e-Zaman, Pradhan, Feroz, Jamal, Amjad, & Ahmed, 2014; Ireland, Marquez, Hatherley, Farmer, Luu, Stevens, & Mitra, 2020; Rojo, Maestre, Piedra, Esteban, Sánchez, Hoz, & del Moral, 2022). In this case, expert involvement is needed to be able to provide feedback and transfer the latest guidelines and science. Emergency nurses, emergency physicians, or emergency study groups, such as emergency nurses' associations may be involved (Amoako-Mensah, Achempim-Ansong, Gbordzoe, Adofu, & Sarfo, 2023). In addition, equipping PHCs with adequate resuscitation devices such as AEDs, and breathing apparatus can also increase nurses' confidence in performing CPR (Abebe, Zeleke, Assega, Sefefe, & Gebremedhn, 2021).

#### CONCLUSION

The factors gender, educational background, and BLS training status were not related to the nurse's level of confidence in performing CPR. The factors that are more dominant in confidence in performing CPR are employment status, age, length of service, and the number of CA cases that have been handled.

#### SUGGESTION

These results can be used as a basis for planning to improve the quality of nurse resuscitation, especially in increasing confidence in performing CPR.

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