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HOW DO KNOWLEDGE AND SELF-EFFICACY OF INTERNSHIP NURSING STUDENTS IN PERFORMING CARDIOPULMONARY RESUSCITATION?

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ABSTRACT

Background: Cardiopulmonary Resuscitation (CPR) is the emergency first aid in cardiac arrest. CPR delivery is influenced by knowledge and self-efficacy. Internship students can be the first responders of cardiac arrest in hospital and they are expected having knowledge and high self-efficacy of CPR. However, there is no data on self-efficacy of internship students in performing CPR.

Objective: The purpose of this research was to identify knowledge and self-efficacy of the internship students in performing CPR.

Methods: The method in this research was descriptive quantitative with cross-sectional approach on 76 internship students selected by simple random sampling. Knowledge questionnaire and Resuscitation Self-Efficacy Scale instrument were used, with validity score of 0.56-0.84 (α=0.91). Data were analyzed using descriptive statistics.

Results: The results showed that 49 respondents (64.5%) had moderate knowledge and 73 respondents (96.1%) had high self-efficacy. The lowest domain in the knowledge was conceptual knowledge, while in the self-efficacy were reporting, debriefing and recording.

Conclusions: Therefore, it becomes important to increase the information on the conceptual knowledge as well as to enhance training on the self-efficacy domains: reporting; debriefing and recording.

Keywords: cardiac arrest, CPR, internship nursing students, knowledge, self-efficacy

INTRODUCTION

The effort in returning circulation immediately when cardiac arrest and/or breathing failure and preventing death is called cardiopulmonary resuscitation (CPR).[1] Giving high quality CPR in golden minutes (1-2 minutes) will

increase survival rate of cardiac arrest patients.[2] Internship nursing students can be the first responder of cardiac arrest in hospital. Before starting to give CPR in golden minutes, nurses are influenced by various factors. Some of these factors are knowledge of CPR, nurses' attitude, nurses' awareness, and nurses' self-efficacy in performing CPR.[3-6]

Out of the factors that influence the nurse in providing CPR, knowledge and self-efficacy are factors that need to be noticed. Knowledge of CPR related to the standard of care and the effectiveness of CPR performance.[3] If the nurse's knowledge of CPR was good then nurse's awareness was also good.[7-10]

In addition, according to Turner et al.[7] a person is not sufficient to have knowledge (know), skills (able to), and the right attitude (prepared to) to effectively handle cases of cardiac arrest, but also sufficient belief in their ability (self-efficacy) is needed to perform CPR in cardiac arrest cases. This is strengthened by Ornato and Peberdy in their book which stated that one of the predictor of CPR ability is self-efficacy.[11] Further, Maibach, Schieber, and Carroll[12] stated that health workers with knowledge and skills of CPR may fail to perform CPR if they have no confidence in their abilities. This is also supported by Gusnia and Saragih[13] who stated that self-efficacy is the dominant factor associated with the adaptation process of novice nurses.

When a person has a good self-efficacy, that person will have a tendency attitude and behavior that support the assistance of cardiac arrest patients.[7-10] It can be inferred that knowledge and self-efficacy are the important factors that influence the delivery of CPR and can predict a person's

CPR ability. Therefore, it becomes important to prepare the knowledge and self-efficacy of internship nursing students in performing CPR.

METHODS

The design used in this research was descriptive quantitative with cross sectional approach. Ethical clearance for this research was given by Medical Research Ethics Commission, Faculty of Medicine, Universitas Padjadjaran with number: 186/UN6. C1.10/PN/2017. Random sampling technique was used to select 76 respondents from 142 internship-nursing students at Faculty of Nursing, Universitas Padjadjaran, Indonesia, on April 2017.

The studied variables were knowledge and self-efficacy. In this research knowledge is defined as the cognitive ability of internship nursing students Faculty of Nursing Universitas Padjadjaran about factual, conceptual and procedural knowledge on CPR up to C2 level of knowledge (Understanding). Self-efficacy is defined as the internship nursing students' beliefs about their capabilities in performing CPR.

First instrument used CPR knowledge questioner consisting of 24 questions with multiple choices of a, b, c, d and e which developed by the researchers. The researchers adapted six questions from the Basic Emergency Care Course Questionnaire developed by Bhoi, et al, adopted one question from National Council Licensure Examination (NCLEX), adjusted to the AHA 2015 guideline, and applied the depth of knowledge to the appropriate level of understanding (C2) according to revised

bloom taxonomy. CPR knowledge questionnaire had been tested by using content and face validity. The second instrument was Resuscitation Self-efficacy Scale (RSES) developed by Roh, Issenberg, Chung, and Kim with the validity value 0.56-0.84 and alpha value 0.91.[14] Afterward, the data were analyzed using the distribution frequency. Knowledge score divide into three categories: good knowledge (if total score is 76-100), moderate (if total score 56-75) and low (if total score <56). Self-efficacy is low if the total score < mean and self-efficacy is high if the total score ≥ mean.

RESULTS

Table 1 Characteristics of the respondents

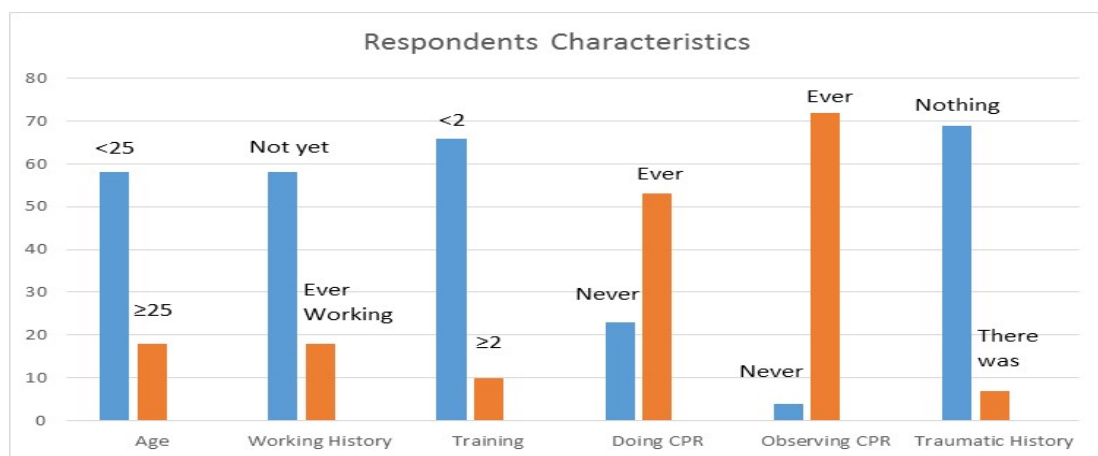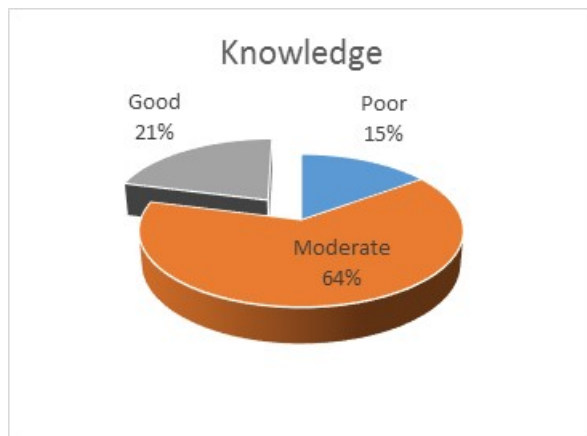| No.	Research Respondents	Frequency (f)	Percentage (%)
1	**Age**		
	Age < 25 years old	58	76.3 %
	Age ≥ 25 years old	18	23.7 %
2.	**Working History**		
	Not working yet	58	76.3 %
	Working (at the hospital, clinic, or Primary Health Care/ Community Health Center)	18	23.7 %
3.	**History of Following CPR Training**		
	Following 1 CPR Training	66	86.8 %
	Following ≥ 2 BLS Training	10	13.2 %
4.	**History of Performing CPR**		
	Never	23	30.3 %
	Ever	53	69.7 %
5.	**History of Observing CPR**		
	Never	4	5.3 %
	Ever	72	94.7 %
6.	**Traumatic History Related to CPR**		
	No, nothing	69	90.8 %
	Yes, there was	7	9.2 %

Figure 1 Characteristics of the respondents

Knowledge

Good 21% Poor 15%

Moderate 64%

Self-Efficacy

Low 4%

High 96%

Figure 2 Knowledge of respondents

Figure 3 Self-efficacy of respondents

From the figure 2 & 3 above can be seen that from 76 respondents, 49 respondents (64.5%) had moderate knowledge and 73

respondents (96.1%) had a high self-efficacy.

Table 2 Knowledge and self-efficacy of respondents

Variable	Mean
Knowledge domain	
Factual knowledge	73.33
Conceptual knowledge	56.58
Procedural knowledge	65.13
Self-efficacy domain	
Recognition	16.13
Debriefing & Recording	15.38
Responding & Rescuing	19.50
Reporting	15.28

In Table 2 it was known that the lowest knowledge domain was conceptual knowledge, and the two lowest domains of self-efficacy were: reporting and debriefing and recording domain.

DISCUSSION & CONCLUSION

Moderate knowledge in this research was caused by nearly half of respondents failed answered 10 items of questions, i.e. neonatal pulse examination, pregnant women position, chest compression location, pulse and breathing examination time, DNAR, indication of defibrillator,

chain survival, principle of 3A, the purpose of defibrillation and things to consider in using a defibrillator. In addition, more than half of respondents failed to answer 4 question, there were the process of care during CPR, the principle of rescue breathing, the purpose of repositioning pregnant women, and the compression ratio in children under 1-year-old. Due to the mean score of these four items were the lowest mean score.

The level of knowledge about CPR is influenced by several factors including age, education, experience, and the environment.[15] Most learners of

resuscitation skills were adults, as many as 58 respondents (76.3%) were in the early adult age category (20-25 years). Adults have a greater inherent need to know why they must learn something, they have more life experiences that serve as potential sources of learning, they become ready to learn things when real-life problems demand new knowledge and skills, they are self-directed, and they are more responsive to internal factors as motivators for learning. At the beginning of 20 years-old there is a very wide cognitive change. In these early adulthood, cognitive development becomes richer, more complex, and dynamic, and individuals will play a greater role with other individuals in different contexts to produce systematic and dynamic variations.[16] It showed that cognitively the respondents had developed, ready, and mature to receive information cognitively.

Through the interview with the respondents, during the education process, the information about CPR for pregnant women, DNAR, the treatment process during resuscitation, and how to conduct appropriate debriefing were still inadequate, while information about other question items was adequately addressed, but that information had just received almost three months ago. Partiprajak et al.,[3] revealed that CPR training has a significant direct effect on knowledge, but knowledge decreased significantly after 3 months post-training. This indicated that the knowledge of internship nursing students tended to decrease; consequently, the training evaluation and repetition were expected to be conducted periodically.

Furthermore, out of the knowledge domain, the conceptual knowledge was the lowest domain. Conceptual knowledge

is the relationships between basic elements with a larger structure that enable them to function together, which contain classifications and categories; principles and generalizations; and knowledge of theories, models, and structures.[17] According to Han et al.,[18] four thinking processes of decision-making by nurse in clinical nursing practice are: reviewing, validation, consideration, and rationalization. The rationalization process is used to justify a person thoughts and actions, and is the basic for problem solving and decision-making. Rationalization includes the making of conclusions, noting reasons and objectives that should guide actions, setting up one's position and inferring to general cases which really depends on one's conceptual knowledge.[18] This indicated that in the next internship nursing students, conceptual knowledge needs to be improved.

In this research, respondents (94.7%) had a history of observing CPR and had done CPR (69.7%). The experience of observing and performing CPR was one of the respondents' knowledge sources. Passali, et al.,[19] revealed that nurses and doctors who had experience delivering CPR and were in a high risk area for cardiac arrest had better knowledge than nurses and doctors who were not in that condition. However, the results of this research were not in line with research of Srinivas et al.,[6] which stated that the knowledge of nursing students about basic live support is still low. It should be noted, that the respondents in Srinivas et al.,[6] research were fresh graduate, whereas in this research the research respondents were internship nursing students who mostly had experience.

Furthermore, the high level of self-efficacy is formed from inactive mastery experience, vicarious experiences, verbal persuasion, physiological and affective states, and influenced by knowledge, experience, motivation and education/training system.[12,20] As many as 72 respondents (94.7%) had experience observing CPR and 53 respondents (69.7%) had experience in performing CPR, and only 7 respondents (9.2%) had traumatic experience related to CPR. This showed that most respondents had direct experience and indirect experience (observing other people), therefore the sources that composed the self-efficacy of this research were already adequate.

Afterwards, as many as 61 respondents (80.3%) were convinced to be very confident to be able to demonstrates staying calm and focusing on required tasks. It showed that respondents had a tendency to control their anxiety or sense of distress and had a tendency to be able to show performance in accordance with the ability when performing CPR. Based on the explanation above indicated that the sources that make up the self-efficacy were adequate; it would encourage the internship students to choose to perform CPR in cases of cardiac arrest they encounter.

In addition to the experience of factors that may influence self-efficacy, according to Alavi et al.,[21] was an efficient knowledge, motivation, and education/training system. The respondents' knowledge about CPR in this research was in moderate category thus this good knowledge also influenced the high self-efficacy in performing CPR. In addition, the high self-efficacy was also affected by the respondents' education process that had used High-Fidelity

Manikins as well as undergone a critical and emergency simulation with High-Fidelity Simulation. It was reported to have a positive impact on knowledge acquisition, retention of knowledge and self-efficacy.[22]

The low self-efficacy in the 3 respondents was due to the self-efficacy statement of the ability to demonstrates staying calm and focusing on required tasks, the three respondents answered least confident, not confident, and lack of confident. This showed that the source of self-efficacy of the ability to control the physical and emotional state is needed to be improved because the three respondents had a tendency to not be able to control their anxiety or sense of distress when CPR performance.

In terms of the self-efficacy domains, reporting, debriefing and recording domain were the two lowest domains. After a review of the respondents' answers, almost half of the respondents were still lack of confident to least confident about debriefing or solving problem after the incident, as many as 27 respondents (35.5%); demonstrates correct management of defibrillator as many as 35 respondents (46.1 %); explaining the clinical findings and critical values of laboratory as many as 29 respondents (38.1%); and utilizing existing resources and external experts as many as 23 respondents (30.2%).

In addition, the nurses at the respondent's practice area stated that the debriefing activity was still quite rare, therefore even while practiced, the respondents did not see or participate in debriefing activities. Whereas in the process of debriefing allows every member to give verbal persuasion to each other for re-

establishing the self-efficacy of its members. Debriefing practice has been done during the learning process, but is still limited to one method with oral debriefing and directed. There are quite a number of debriefing methods that can be used to improve the knowledge and quality of CPR, such as oral debriefing, oral debriefing coupled with sound recording when action, self-debriefing or with instructor, and debriefing combined with video during action until debriefing that preceded by conducting a literature review at home or home research. A research conducted by Chronister et al.,[23] showed that the method of debriefing using video and verbal can improve response time and using the oral debriefing method can increase the retention of knowledge. This suggested that oral debriefing with video could be an appropriate choice to improve the quality of action.

Exposure to defibrillator usage was still lacking, which results in most respondents being unsure of the use of defibrillators. Less experience in the use of defibrillators can also reduce knowledge and self-efficacy. Lack of availability of tools can lower individual knowledge due to lack of application of such knowledge.[15] And the low self-efficacy in explaining the clinical findings and critical values of laboratory and utilizing existing resources and external experts caused by the low conceptual knowledge. Therefore, to increase self-efficacy of respondents in 4 aspects above, it can be done by strengthening the sources and factors that influence self-efficacy, specifically by improving the experience of internship nursing students related to debriefing activities, defibrillator usage interpretation of the clinical findings and critical values

of laboratory, and increased conceptual knowledge related to these four aspects.

The results of this research were not in line with research conducted by Waloyo[24], which stated that the self-efficacy of most nurses (75%) are in adequate category. When compared with this research, it was important to note that the respondent characteristics were different and the instruments used in the Waloyo's research studies focused on the self-efficacy dimension while in this research the instruments used in measuring self-efficacy focused on the treatment process during CPR.

References
1. Davey P. *Medicine at a glance*. New Jersey: John Wiley & Sons; 2015.
2. Lenjani B, Baftiu N, Pallaska K, et al. Cardiac arrest–cardiopulmonary resuscitation. *Journal of Acute Disease.* 2014;3(1):31-35.
3. Partiprajak S, Thongpo P. Retention of basic life support knowledge, self-efficacy and chest compression performance in Thai undergraduate nursing students. *Nurse Education in Practice.* 2016;16(1):235-241.
4. Ro YS, Do Shin S, Song KJ, Hong SO, Kim YT, Cho S-I. Bystander cardiopulmonary resuscitation training experience and self-efficacy of age and gender group: Anationwide community survey. *The American Journal of Emergency Medicine.* 2016;34(8):1331-1337.

5. Ro YS, Do Shin S, Song KJ, et al. Public awareness and self-efficacy of cardiopulmonary resuscitation in communities and outcomes of out-of-hospital cardiac arrest: A multi-level analysis. *Resuscitation.* 2016;102:17-24.

6. Srinivas HT, Kotekar N, Rao SR. A survey of basic life support awareness among final year undergraduate medical, dental, and nursing students. *International Journal of Health & Allied Sciences.* 2014;3(2):91.

7. Turner NM, Lukkassen I, Bakker N, Draaisma J, ten Cate OTJ. The effect of the APLS-course on self-efficacy and its relationship to behavioural decisions in paediatric resuscitation. *Resuscitation.* 2009;80(8):913-918.

8. Hamasu S, Morimoto T, Kuramoto N, et al. Effects of BLS training on factors associated with attitude toward CPR in college students. *Resuscitation.* 2009;80(3):359-364.

9. Shahsavarinia K, Tagizadieh A, Pouraghaei M, et al. Assessment of attitude and knowledge of personnel in the Intensive Care Unit of Tabriz University of Medical Sciences Hospitals Toward Organ Donation. *Transplantation proceedings.* 2016; 48(8): 2577-2581.

10. Dayapoğlu N, Tan M. Clinical nurses' knowledge and attitudes toward patients with epilepsy. *Epilepsy & Behavior.* 2016;61:206-209.

11. Ornato JP. Cardiopulmonary resuscitation. *Essential Cardiology*: Springer; 2005:521-530.

12. Maibach EW, Schieber RA, Carroll MFB. Self-efficacy in pediatric resuscitation: implications for education and performance. *Pediatrics.* 1996;97(1):94-99.

13. Gusnia SS, Saragih N. Hubungan karakteristik perawat pada program preceptorship terhadap proses adaptasi perawat baru [Relationship of nurses' characteristics, preceptorship program, and adaptation process of new nurses].
Jurnal Keperawatan Padjadjaran. 2013;1(1): 10-17.

14. Roh YS, Issenberg SB, Chung HS, Kim SS. Development and psychometric evaluation of the Resuscitation Self-efficacy Scale for nurses. *Journal of Korean Academy of Nursing.* 2012;42(7):1079-1086.

15. Alegría GA, Díaz AV, Laveriano DMQ, et al. Factores asociados al nivel de conocimiento en reanimación cardiopulmonar en hospitales del Perú. *Revista Colombiana de Anestesiología.* 2017;45(2):114-121.

16. Fischer KW, Yan Z, Stewart J. Adult cognitive development: Dynamics in the developmental web. In: Jaan V, Kevin JC, eds. *Handbook of developmental psychology.* London: Sage Publications; 2003. p 491-516.

17. Krathwohl DR. A revision of Bloom's taxonomy: An overview. *Theory Into Practice.* 2002;41(4):212-218.

18. Han K-J, Kim HS, Kim M-J, et al. Thinking in clinical nursing practice: A study of critical care nurses' thinking applying the think-aloud, protocol analysis method. *Asian Nursing Research.* 2007;1(1):68-82.

19. Passali C, Pantazopoulos I, Dontas I, et al. Evaluation of nurses' and doctors' knowledge of basic & advanced life support resuscitation guidelines. *Nurse Education in Practice.* 2011;11(6):365-369.

20. Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review.* 1977;84(2): 191.

21. Alavi A, Bahrami M, Zargham-Boroujeni A, Yousefy A. Pediatric nurses' perception of factors associated with caring self-efficacy: A qualitative content analysis. *Iranian Journal of Nursing and Midwifery Research.* 2015;20(2):232.

22. Akhu-Zaheya LM, Gharaibeh MK, Alostaz ZM. Effectiveness of simulation on knowledge acquisition, knowledge retention, and self-efficacy of nursing students in Jordan.

Clinical Simulation in Nursing. 2013;9(9):e335-e342.

23. Chronister C, Brown D. Comparison of simulation debriefing methods. *Clinical Simulation in Nursing.* 2012;8(7):e281-e288.

24. Waloyo E. *Hubungan pengetahuan resusitasi jantung paru dengan self-efficacy perawat di RSUD Wonogiri [Relationship of knowledge of cardiopulmonary resuscitation and nurses self efficacy in Wonogiri General Hospital].* Surakarta: Stikes Kusuma Husada; 2016.