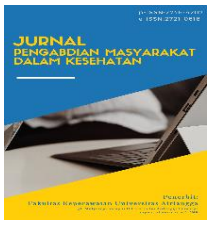

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KNOWLEDGE AND SKILL OF BASIC TRAUMA AND CARDIO LIFE SUPPORT AMONG UNDERGRADUATE NURSING STUDENTS

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ABSTRACT

Introduction: Basic trauma and cardio life support (BTCLS) is primarily focused on ensuring widespread and uniform implementation of life saving. Classical face to face teaching method and practices have been widely applied in higher nursing education to increase cognitive and psychomotor. The Aim of this community service was to increase knowledge and skills of BTCLS among undergraduate nursing students.

Methods: BTCLS program was delivered through lecture, demonstration, and simulation. The instrument used was developed by the Indonesia emergency and disaster nurse association (HIPGABI). A self-report paper-based questionnaire was applied to measure the level of knowledge and skills. Data was analysed by descriptive statistics.

Results: The demographic characteristic of participants were dominated by group of age 18 to 30 year-old (85.56%), female (73.33%), and those who have no clinical working experience (68.89%). The lowest education and skill scored was management of trauma whom were 55.56% passed and 70% was high skill. The pre-test showed around 60% participants was passed. The post-test, 100% participants met the pass level of each category with the highest knowledge and skill's score was basic life support. After the whole program delivered, all participants convened the knowledge and more than 80% categorised as high skill.

Conclusion: The given training program showed face to face teaching, simulation, and demonstration improved knowledge and skills related to BTCLS benefited participants. The BTCLS education and training highlighted knowledge should be periodically updated, technical skills should be consolidated, and sufficient equipment's should be established in accordance with training and certified trainer.

KEYWORDS

basic trauma and cardio life support; community service; education; training; undergraduate nursing.

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1. INTRODUCTION

Provision of up-to-date information and skills training related to basic life support practices in the higher nursing education programs is crucial for nursing students' professional development, practitioner and education related roles (Dick-Smith et al., 2021). In the clinical practice, nurses have important roles and responsibilities in terms of informing the society on current basic trauma and cardio life support(Kose et al., 2019). Due to lack of clinical experience, limited knowledge and skills, undergraduate nursing students may face critical situation and have to deal with in-hospital cardiac arrest, injuries, and burns (Nopitasari et al., 2021).

Therefore, it is a basic requirement for undergraduate nursing students in Indonesia to show their BTCLS competency prior entering the clinical stage (Kurniati et al., 2020).

BTCLS performance involves a spectrum of cognitive knowledge and psychomotor retention skills (Sartono et al., 2022). BTCLS consists of trauma and cardio-pulmonary resuscitation (CPR) knowledge in relation to standard care is fundamental in effective resuscitation performance (Olasveengen et al., 2021; Prianto, 2020). In the 2010 American Heart Association (AHA) guidelines for CPR, emphasis was placed on high-quality CPR, particularly with regard to the following: "Push hard, push fast," "allow the chest to completely recoil each time there is a chest compression", and "*minimal interruption of chest compression*" (Merchant et al., 2020; Panchal et al., 2019). In Indonesia, CPR training is affiliated with the Indonesia emergency and disaster nurse association or "*Himpunan Perawat Gawat Darurat Indonesia* or *HIPGABI*" and follows guidelines recommended by the AHA (Kurniati et al., 2020).

During their four years academic stage, the nursing students have been taught in the class, critical laboratory for any skill related to BTCLS , and practice with peers (Zevanya et al., 2020). In the 'author's school of nursing, the training has incorporated BTCLS standard authorized by HIPGABI (Kurniati et al., 2020) in combination with communication and critical thinking skills. The criteria for certification include achievement on the written examination of more than eighty percent, and passing the BTCLS skill performance evaluation using the guidelines recommended by the *HIPGABI*, communication and critical thinking skills measurement developed by the BTCLS education and training committee. The BTCLS program was publicly opened for general nursing students and other programs related health.

BTCLS education and training program would be beneficial for establishing a guideline for a retraining course (Dick-Smith et al., 2021). It has been studied effective trauma management and cardiopulmonary resuscitation (CPR) can better the chance of morbidity and survival of cardiac arrest victim (Soar et al., 2021). Considering cardiac arrest in the hospital, the triggers of CPR activation are usually detected and managed by nurses (Prianto, 2020). Undergraduate nursing students practice in clinical settings have to provide care for patients at risk of cardiac arrest (Martínez-Isasi et al., 2021). However, lack of resuscitation competencies has been reported among undergraduate nursing students, as it has been for other healthcare professionals. This issue may be related to evidence suggesting that resuscitation knowledge and skills rapidly deteriorate over time, even with recent optimal training. Therefore, the education and training is provided with aims to support undergraduate nursing student's knowledge and skills of BTCLS.

2. MATERIAL AND METHODS

The community service of BTCLS education and training programs was caried out on 24-27 August 2016 at Faculty of Nursing, Universitas Airlangga Indonesia. The whole activities were scheduled for four days counted of 30 hours. The trainee was undergraduate nursing students. Teaching method used in this program was classical face to face education, simulation, and demonstrations. The instrument used in this study was developed by the Indonesia emergency and disaster nurse association (HIPGABI). A self-report paper-based questionnaire was applied to measure the level of knowledge and skills. Data was analysed by descriptive statistics. The education section was set in a big classroom and the training was conducted in small class rooms and laboratories. Two certified BTCLS trainers was set into a small group consisted 10 to 11 participants.

The knowledge of BTCLS was measured by paper-based pre-test and post-test . This included measuring for cognitive of eight components of

BTCLS (1) basic life support or BLS, (2)triage, (3)initial assessment, (4)airway and breathing management,(5)management of trauma included head, neck, spinal, thoracic, abdominal, musculoskeletal, and burns, (6)circulation, (7)emergency cardiovascular management, and (8)evacuation and transportation (Kurniati et al., 2020; Merchant et al., 2020; Panchal et al., 2019). Questionnaires were administered to all participants in the first day of the programs. Each room for the training section was supported by set of BTCLS equipment related to the specific skill. The Resusci Anne® manikin and Laerdal skill-meter were provided to perform basic life support, initial assessment, airway and breathing management, circulation, and emergency cardiovascular management. Each group then move to each room to complete the whole skills.

During the education and training, the level of knowledge was evaluated twice; before and after the training. The performance was only at one point in time immediately after the training. The pass knowledge level was equal to correct score of 80. The skill level was categories into high (> 80), moderate (70-79), and low (< 69). The results were presented in descriptive statistics. After finishing the post-test, participants continued to perform BTCLS skills (Kurniati et al., 2020; Merchant et al., 2020). Any errors or misunderstanding regarding BTCLS cognitive knowledge in the pre-test and post-test were corrected by the trainers.

3. RESULTS

The demographic characteristic of participants included age, gender, and clinical working experience. According to the table 1, age of participants were dominated by group of 18 to 25 year-old (47.78%), more than two-third (73.33%) was female, and those who have no clinical working experience (68.89%). Table 1 shows that the distribution of respondents.

Table 1. Demographic characteristics of participants (N=90)

Variable	N	%
Age		
18-25	43	47.78
26-30	34	37.78
31-35	8	8.89
36-40	4	4.44
41-45	1	1.11
Gender		
Male	13	14.44
Female	66	73.33
Clinical working experience		
Yes	28	31.11
No	62	68.89

In the pre-testing, the participants who passed the level BTCLS cognitive knowledge was crossed half. Concerning the skill, management of trauma; head, neck, spinal, thoracic, abdominal, musculoskeletal, and burns, 50 participants (55.56%) who passed. Out of eight BTCLS component skills, 69 (76.76%) participants crossed the pass level of basic life support. In the post-test immediately at the end of the training, the BTCLS cognitive knowledge reached passed level of 100%. All of them (100%) passed the standard test in each category. Detail proportion of the participants is presented in Table 2.

The results for BTCLS skill performance are illustrated in Table 3. All of the participants (100%) could perform basic life supports as well as initial assessment. Approximately 98% could perform adequate airway and breathing management, and almost all of them (approximately 99%) succeeded in triage.

4. DISCUSSION

The BTCLS education and training program was aimed to support undergraduate nursing students with sufficient knowledge and skill of BTCLS. Currently, the trainee of the training completely the academic level and will enter the clinical stage. The BTCLS knowledge and skill training program was dominated by group of participants age 18 to 30 year-old (85.56%), female (73.33%), and have no clinical working experience (68.89%). Eight component of

Table 2. Level of knowledge of Basic Trauma Life Support (N=90)

Component	Pre-test		Post-test	
	Pass	Failed	Pass	Failed
Basic life support	69 (76.67%)	21 (23.33%)	100 (100%)	0 (0%)
Triage	66 (73.33%)	24 (26.67%)	100 (100%)	0 (0%)
Initial assessment	60 (66.67%)	30 (33.33%)	100 (100%)	0 (0%)
Airway and breathing management	63 (70%)	27 (30%)	100 (100%)	0 (0%)
Management of trauma; head, neck, spinal, thoracic, abdominal, musculoskeletal, and burns	50 (55.56%)	40 (44.44%)	100 (100%)	0 (0%)
Circulation	61 (67.78%)	29 (32.22%)	100 (100%)	0 (0%)
Cardiovascular emergency management	68 (75.56%)	22 (24.44%)	100 (100%)	0 (0%)
Evacuation and transportation	65 (72.22%)	25 (27.78%)	100 (100%)	0 (0%)

Table 3. Level of Skill of Basic Trauma Life Support (N=90)

Component	High	Moderate	Low
Basic life support	90 (100%)	0 (0%)	0 (0%)
Triage	89 (98.89%)	1 (0.01%)	0 (0%)
Initial assessment	90 (100%)	0 (0%)	0 (0%)
Airway and breathing management	88 (97.78%)	2 (2.22%)	0 (0%)
Management of trauma; head, neck, spinal, thoracic, abdominal, musculoskeletal, and burns	76 (84.44%)	14 (15.56%)	0 (0%)
Circulation	83 (92.22%)	7 (7.78%)	0 (0%)
Cardiovascular emergency management	81 (90%)	9 (10%)	0 (0%)
Evacuation and transportation	79 (87.78%)	11 (12.22%)	0 (0%)

BTCSL (Kurniati et al., 2020) were (1) basic life support, (2) triage, (3)initial assessment, (4)airway and breathing management,(5)management of trauma included head, neck, spinal, thoracic, abdominal, musculoskeletal, and burns, (6)circulation, (7)emergency cardiovascular management, and (8)evacuation and transportation delivered by the certified BTCLS trainers. Nevertheless, none of the knowledge component of BTCLS reached 100% pass level in the pre-test section. This may have caused low acquisition of cognitive knowledge before attending the BTCLS course.

BTCLS training included both theoretical and practical components (Dick-Smith et al., 2021; González-Salvado et al., 2020). All above eight BTCLS components the retention of management of trauma; head, neck, spinal, thoracic, abdominal, musculoskeletal, and burns knowledge and skills are issues. The level of knowledge and skills of this particular area of BTCLS presented the lowest (84.44%). In the performance skill, the scored of evacuation and transportation was the second lowest of 87.78%. Practice in these skills are significant in terms of maintaining competency; although nursing students seem passed the basic life support and initial assessment, they may not deal with management of trauma; head, neck, spinal, thoracic, abdominal, musculoskeletal, and burns during this time frame. As a result, lack of practice after training can bring psychomotor skill declination (Nopitasari et al., 2021; Onan et al., 2019). Specific skills of evacuation and transportation of patients with critical condition require sufficient training to gain the competence level (Basri & Istiroha, 2019; Putri et al., 2019).

The pre and post test score of the BLS knowledge and skills was higher than that of eight components of BTCLS. This is mainly because BLS programs have been tailored in the general lecture of emergency and critical nursing. Undergraduate students have counted more credits in this subject. Resulted retaining the knowledge and performance of BLS. Therefore, one may then conclude that, the more experienced nurses are, the more knowledgeable about BLS they should be. Additionally, it was

determined that post-training assessment scores documented 100% pass level for the knowledge compared to pre-training scores and 0% low skill of BTCLS after the training accomplished. Moreover, they indicate that short periods of training, face to face lecture, simulation, and demonstration. It was in line with previous studies demonstrated that basic life support training significantly improved nursing students' knowledge, practice skills, attitudes, and positively influence learning ability (Iserbyt & Madou, 2022; Salameh et al., 2018). The course is a resource that can be used for training students and for the continuing education of professionals (Kose et al., 2019; Tobase et al., 2017). The traditional teaching method, which has long been used to teach skills and promote the acquisition of clinical expertise is still accepted and relevant as the best way to teach students.

According to the AHA, learning BTCLS maneuvers is considered highly important(Olasveengen et al., 2021; Srinivas et al., 2014). The earlier the course presented to the students, the greater the possibilities of re-training and application in the field of practice, in educational stages and clinical activities. BTCLS education and training program among undergraduate nursing students immediately after they completed academic phage gave new meaning to the learning and experiences. Frequent references to the course contributes to learning retention of BTCLS support maneuvers, given that knowledge tends to degrade over time and need to periodically re-charged.

5. CONCLUSION

Before and after BTCLS training delivered, there was differences in the level of knowledge and skill. The level of knowledge was higher compared to pre-training scores and practical skill performance scores high. The given training program showed that face to face teaching, simulation, and demonstration improved knowledge and skills related to BTCLS in nursing students. It is very important for the success of theoretical and practical of BTCLS training to set groups in appropriate size using valid methods in accordance with international and national guidelines. The BTCLS training highlighted knowledge should be periodically updated, technical skills should be consolidated, and sufficient equipment's should be established in accordance with training and certified trainer.

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