



The Impact of Advanced Cardiac Life Support to Baccalaureate Nursing Students' Perceived Competence in Performing Resuscitation Skills

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Abstract

The perceived competence of nursing students in performing resuscitation after completing an ACLS certification course was explored. This evaluation will aid in program evaluation and serve as a basis for further investigation. Baccalaureate nursing students receiving ACLS certification in the final semester of their nursing education self-reported an increase in perceived confidence related to performing resuscitation following the ACLS course.

Keywords

ACLS certification, Nursing education, Baccalaureate students, Resuscitation skills

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Upon the completion of a pre-licensure baccalaureate nursing program (BSN), it is reasonable for students to be proficient at recognizing patient deterioration and have gained primary emergency response skills as they enter the clinical environment. Advanced Cardiac Life Support (ACLS) certification course bolsters confidence in clinical assessment skills, decision making, evaluative competence, and prioritization of patient care for nursing students prior to graduation [1]. Evaluation of the impact of an ACLS course on students' perceived competence in performing resuscitation skills will aid in program evaluation and serve as a basis for further investigation. The purpose of this small pilot study was to explore the perceived competence of nursing students in performing resuscitation after completing an ACLS certification course.

Literature Review

Literature related to the outcomes of nursing students attaining ACLS certification while in initial training is limited. Rice et al. [2] found undergraduate nursing students in Northern Ireland indicated that participating in an immediate life support course assisted in the transition to qualified nurse and led to a significant increase in confidence and skills for managing deteriorating patients [2]. Nursing students, medical students, and junior residents reported value in the instruction of resuscitations skills utilizing ACLS scenarios and felt the encounters should be a mandatory part of their education [3].

Smith et al. [4] showcased ACLS as a viable pedagogical approach in combination with required clinical hours to increase confidence in triage decision making among nursing students [4]. King and Reising utilized BSN students in a study to compare static simulation to high-fidelity simulation in teaching ACLS and noted additional research was needed to evaluate the different learning needs of students versus practicing nurses [5].

In a systematic review conducted by Smith et al. [6] preparation of healthcare staff for acute care was noted as suboptimal and was suggested as a priority in medical education, starting at the undergraduate level [6]. While nurses are required to have basic life support training, opportunities to practice these skills are limited. Opportunities for newly graduated nurses are especially limited. New graduates and practicing nurses struggle with critical thinking and the knowledge base to recognize critical cues in deteriorating patients. These skills are necessary in managing deteriorating patients' needs and bolsters confidence in deciding on treatment options [2,7-9]. Recognizing the roles and responsibilities of caring for a patient experiencing cardiopulmonary arrest leads to more successful patient outcomes [10]. Additionally, effective training is needed for staff nurses who are often the first initiators of resuscitation efforts [11]. The limited opportunities for baccalaureate nursing students to develop skills in cardiopulmonary resuscitation can be replaced by simulation training involving mock codes [7,9]. Providing ACLS certification to graduating nurses may improve clinical competence in the management of deteriorating patients as these graduates enter the nursing workforce.

Method

A pre and posttest survey was used to evaluate the impact of an ACLS certification course attended by BSN students prior to graduation. Institutional review board approval was obtained for the study prior to initiation.

Setting and Participants

The evaluation was conducted at a University health science center that admits approximately 100 students into a BSN program annually. The students involved were senior level students enrolled in a final semester clinical course focusing on transitioning to professional nursing practice. The course requires participation in

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Table 1: Scores for individual items on perceived competence in resuscitation questionnaire.

Individual Item	Pre-test mean score	Posttest mean score
	1 (seldom confident) to 5 (very confident)	1 (seldom confident) to 5 (very confident)
Initiates relevant patient monitoring (vital signs, EKG, pulse oximeter ---)	3.94	4.6
Understands when to call for help	3.83	4.76
Demonstrates basic airway maneuvers (oxygen, suction---)	3.46	4.6
Recognizes signs and symptoms of a critical patient	3.44	4.52
Performs a focused assessment following the ABC (airway, breathing, circulation) principles	3.9	4.65
Demonstrates correct administration of relevant drugs	3.1	4.29
Demonstrates correct management of defibrillator	2.83	4.37
Demonstrates effective bag-mask ventilations (volume, minute volume, pressure etc.)	3.13	4.7
Performs appropriate post-resuscitation care	2.4	4.24
Demonstrates effective chest compressions (hand placement, depth, speed)	3.95	4.89
Utilizes resources and external experts	3.4	4.62
Demonstrates prioritizing key tasks	3.11	4.29
Demonstrates clear and concise communication	3.48	4.49
Establishes clear team member roles	3.3	4.68
Demonstrates rapid implementation of problem-solving solutions	3	4.29
Demonstrates prompt and firm decision making	2.97	4.32
Performs re-assessment or re-evaluation	3.52	4.51
Demonstrates staying calm and focusing on required tasks	3.56	4.44

an ACLS certification course as part of the clinical component. The 2-day class is taught by certified ACLS instructors using guidelines and certification requirements established by the American Heart Association (AHA). A convenience sample of 67 undergraduate pre-licensure nursing students was recruited two weeks prior to the scheduled ACLS certification class when the ACLS books were distributed by the course instructor.

Instrument

All consenting students were administered the Perceived Competence in Resuscitation Questionnaire prior to taking the ACLS course and then again immediately following the completion of the course. The Perceived Competence in Resuscitation Questionnaire was developed by Roh et al. [11] to fill a gap in instrumentation measuring nurses' perceived competence in technical and non-technical skill simultaneously across the resuscitation process [11]. The survey is self-administered and includes 18 items utilizing a five point Likert scale for responses ranging from 1 (*seldom confident*) to 5 (*very confident*) with higher scores indicating higher degrees of perceived competence. The instrument has shown good reliability with a reported Cronbach's alpha of .95 for the summed scale. Permission was granted by Dr. Chung from the Yonsei University College of Medicine in Seoul, Korea to utilize the instrument.

Data Collection Procedure

Recruitment was completed by research team members who had no input in students' course grades to avoid perceived coercion. The study was explained and students were reassured that either participation or non-participation in the study would have no impact on progression through the course. An opportunity to ask questions was provided. A study information sheet and pre-test study questionnaire were placed in the front cover of all ACLS books distributed to students and those interested in participating were asked to complete the pre-test questionnaire prior to exiting the room at the end of the class period. Each ACLS book was coded to ensure anonymity with the same code printed on the corresponding pre-test. Students choosing to complete the post-tests following were asked to print this code on the top the distributed questionnaire. Pre-test and post-test questionnaires were easily matched for data analysis. The timing of the pre-test with the ACLS book distribution allowed the collection of self-reported data prior to students' viewing the ACLS certification content. Time between pre-test and post-test questionnaire administration was approximately two weeks, with the post-test administered immediately following the completion of the certification course. All students enrolled met the course requirements for initial ACLS certification.

Data Analysis

A student's *t* test was used to determine the difference between the students' perceived competence in performing resuscitation pre and post ACLS course. The data met all assumptions for parametric statistical analysis. A priori alpha was set at .05 and the data from the questionnaires was manually entered into SPSS version 22. Table 1 provides details regarding the pre course and post course responses for the 18 items of the self-administered survey.

Results

At total of 63 completed questionnaire sets were collected (94% response rate). Demographic characteristics of the sample ($N = 63$) showed a majority of female participants (90.5%) with an age range from 21 to 40 ($M_{age} = 23.22$; $SD = 3.15$). The sample was represented by 4 (6.3%) Asian students, 1 (1.6%) Hispanic student, and 58 (92.1%) Caucasian. The sample represented 47 (74.6%) traditional degree baccalaureate students and 16 (25.4%) second degree baccalaureate students. A statistically significant difference exists between the students' perceived competence in performing resuscitation before and after the ACLS course; $p < .000$, $d = 3.30$.

Discussion

Nurses in today's healthcare environment often experience higher acuity patients that require advanced skills such as ACLS. The skills obtained from taking an ACLS certification course during initial training can help new nurses to assess patients with a more critical eye, assessing changes that indicate patient deterioration. ACLS certification supports clinical assessment skills, critical decision making, and prioritization which assist the new nurse in making these assessments [1]. The ability for new nurses to recognize and intervene appropriately for a deteriorating patient can lead to better patient outcomes. Additionally, preparing students with such skills prior to graduation can potentially offset the burden of healthcare facilities' new nurse orientation.

This preliminary assessment suggests that providing an ACLS course to nursing students prior to graduation provides the advantage of perceived confidence to perform resuscitation when transitioning to clinical practice. Repeated measures with one group, one dependent variable and no control group were used. It is not possible to attribute the difference in perceived competence to merely the ACLS certification class. While results suggest that 73% of the variance may be attributed to the intervention, there are many extraneous variables such as course or clinical exposure and prior experience taking the survey that are potential impactful. While the response to this single site, small sample was positive, the sample size was a limitation of the

study. There is no way to assure that the knowledge obtained by these graduating students will impact patient outcomes in clinical practice. While the ACLS certification course provides basic information and skill performance, the level of evaluation of student performance is that of Kirkpatrick's Level 2, measuring skill and knowledge [12].

Kirkpatrick's 4-level model of evaluation are: reaction, learning, behavior, and results [12]. Level 1 is about learner satisfaction, while Level 2 focuses on measuring the learning has been acquired in the form of knowledge and skills. Learner satisfaction was collected during the post-course evaluation and the measurement for Level 2 evaluation was obtained during the summative evaluation of knowledge through written assessment and skills by return demonstration in simulation scenarios by each student for attainment of ACLS certification. Evaluation of Level 3 would involve assessment of the newly acquired ACLS skills in true clinical situations. This leaves an areas open for future research as does the evaluation of Level 4 to measure the impact of ACLS training for healthcare outcomes when the graduated nurses face resuscitation situations as licensed nurses.

A subsequent study utilizing a larger sample size, control group, and multiple sites is needed to elicit more explicit findings for generalizability. Adaptations to the methodology could include multiple university settings for a repeated measures analysis of variance and longitudinal studies measuring the impact of ACLS certification on new graduates in their first work setting. Evaluations made by the ACLS instructors on skill performance would potentially decrease the issues related to self-report bias, similarly examine if self-efficacy actually translates to practice following the course. Suggestions for future research could also include a study examining the effects of the ACLS class completed during initial training with new nurses transitioning into the clinical setting.

Conclusion

This evaluation sought to explore the perceived competence of nursing students in performing resuscitation after completing an ACLS certification course and is a beginning in evaluation of baccalaureate nursing students who receive an ACLS course in the final semester of their nursing education. Students experienced an increase in perceived confidence related to performing resuscitation following the ACLS course. As educational institutions seek to close the gap between education and clinical practice, offering an ACLS course prior to graduation may improve the nursing students' initial clinical practice and decrease the orientation time for newly practicing nurses. Ultimately, an increased confidence level in performing resuscitation among nursing students may improve overall nursing care and patient outcomes when transitioning to

practice. The potential in developing students' confidence in their ability to recognize and act on patient deterioration as they graduate and move into the clinical setting in a clinical setting will require further evaluation.

Ethical Statement

The study protocol utilized was approved by the Institutional Review Board at Texas A&M University.

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