



International Journal of Medical and Exercise Science

(Multidisciplinary, Peer Reviewed and Indexed Journal)

ORIGINAL ARTICLE

THE EFFICACY OF INTENSIVE SIMULATION AIRWAY MANAGEMENT TRAINING PROGRAM ON THE FINAL YEAR NURSING IN ONE OF HEALTH TRAINING INSTITUTIONS IN NORTHERN BORNEO

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ABSTRACT

Background: Managing airway is very crucial and it is the essential component in emergency care syllabus throughout nursing program training. It is impossible to learn on artificial airway management in the real clinical zone due to the complexity of clinical conditions and the variations of treatment procedures. This study is to evaluate the effectiveness of the simulation airway management training program developed for the final year nursing students whom rarely been assessed before they were posted into the real learning environment. **Methodology:** This is a quasi-experimental one group of pretest and posttest of final years nursing were exposed with the Intensive simulation of airway management technique which includes BLS, measure and insertion of oropharyngeal, high flow O₂ administration, interpret ECG, use of defibrillator and understanding role of arrest team during emergency. **Results:** There exists adequate evidence to show that there was a significant different in the mean score of pretest and the mean score of posttest. The result shown significant with CI95% (-0.53414, -0.09586), $t = -3.009$, $df = 19$ and $P < 0.05$. **Conclusion:** Intensive simulation training program on airway management serves as a bridge on the breachamid class room teaching and the applied skills. It acts as a reinforcement strategy on the technical and nontechnical skills to determine their competency the most important thing derived from this study is the increases of students' sense of security and confidence before they are exposed to real clinical areas.

Keywords: Airway Management, Simulation Training, Nursing Student, Confident Level, Emergency

Received on 6th November 2020, Revised on 20th November 2020, Accepted on 26th November 2020
DOI:10.36678/IJMAES.2020.V06I04.006

INTRODUCTION

Clinical attachment to the Emergency and Trauma Department was a requirement in the curriculum for final year nursing students in Health Training Institutions in Northern Borneo. The clinical objective of this two-week clinical placement was to gain knowledge and skills in delivering care for critically ill patients such as Traumatic Brain Injury (TBI), Motor Vehicle Accident (MVA), and other trauma-related injuries. They were also required to enhance their confidence level in involving airway management during resuscitation in the red zone, such as preparing for endotracheal tube (ETT) insertion and intubation.

Airway management was a part of the basic in Basic Life Support training. The final year of the Health Training Institutions in Northern Borneo nursing students had already received the Basic Life Support training when they were in Year Two Semester Two 2 (almost 1 year before). Therefore, airway management was not a new practice for them as they already experience basic resuscitation in the ward. However, it was different for clinical placement especially critical environments such as the Emergency and Trauma Department.

Williams and Palmer (2013) and Rushton (2015) suggested that critical clinical settings may contribute the most creating nervousness circumstances for nursing students, and this may interfere with their performance, confidence level, and ability to learn^{14,11}. Nursing students need the experience of confronting challenges in the care of patients they will undoubtedly face in real-world health care settings.

Simulation training was not a new experience among final year nursing students in Health Training Institutions in Northern Borneo. The curriculum in the Health Training Institute requires simulation for almost all procedures related to nursing practices such as wound dressing, insertion of the Ryle's Tube, and vital observation. Simulations are defined as situations where models were used for practice and to gain experience that will enhance students' practical skills (Munangatire & Naidoo, 2017)⁶.

The use of simulations in clinical skills training can stimulate deep learning and help students to bond the breakamid theory and practice in nursing (Marucaet al., 2015)⁴. Satyapal, Rout, and Sommerville (2018) wrote that in airway simulation drill has been part of most recommended internationally¹². Still, even though the benefits shown for intermediate results such as trainee fulfilment (Roh, Kim, and Kim, 2014), skills attainment and behaviour-process, simulation has not yet been established to have a substantial effect on patient outcomes¹⁰.

McGough and Heslop (2016) suggested that the development of authentic simulation activities grounded in clinical practice and clinical standards will enhance and personalize the learners' experience and assist students in developing critical thinking relevant to the healthcare environment⁵. The advantages of simulation drill also include calibration and recurrence of content, interactive education in a clinical setting without compromising patient safety (Ballangrudet al., 2013 and Sideraset al., 2013), and the capability to strategize goal-oriented clinical involvements^{1,13}. Simulation brings a learner-attentive, non-threatening educational setting that was unencumbered by

patient service obligations. This has been revealed in many studies where simulations positively impacted on clinical decision-making and patient care, and there has been considerable interest in the use of simulation in nurse training⁵.

Problem statement: All final year nursing students of Health Training Institutions in Northern Borneo were allocated to the Emergency and Trauma Department to gain experience in critical care. However, this was their first time entering the Emergency and Trauma Department. Williams and Palmer (2013) stated that extreme anxiety might be experienced by a nurse who first time entering critical care. According to Williams and Palmer (2013) and Lin (2016), generally, clinical settings have long been described as one of the most anxiety -producing situations for students and this could affect with their performance and ability to study^{14,3}. Prior to their first clinical attachment to the Emergency and Trauma Department, some of the final year nursing students of Health Training Institutions in Northern Borneo verbalize anxiety towards the critical environment. Rushton (2015) stated that students might express fear, feel unprepared and anxious towards the critical clinical setting because of a lack of exposure to the critical environment¹¹.

Previous final nursing students of Health Training Institutions in Northern Borneo had verbalized low confidence in handling airway management during resuscitation at the red zone. Staffs of the Emergency and Trauma Department also verbalize that some of the previous final nursing students were reluctant to participate during resuscitation in the red zone. Williams and Palmer (2013) also suggested that critical care settings, such as the

intensive care unit and emergency department were probable to become more demanding in the upcoming due to advances in technology and health care¹⁴. Lacks of placement opportunities also contribute anxiety among students as stated by Rushton (2015). This study aimed to determine the efficacy of simulation training in airway management among final year nursing students of Health Training Institutions in Northern Borneo¹¹.

METHODOLOGY

This was a quasi-experimental research design, in which the participant was divided into test and control group without randomization. According to Polit and Beck (2014), the quasi-experimental research design was the non-equivalent control group pretest-posttest design, which involving comparing two or more groups of people before and after implementing an intervention⁷. Figure 3.1 shows the research framework on simulation training efficacy in airway management during resuscitation in the red zone among final year nursing students of Health Training Institutions in Northern Borneo. A total sample of forty final year nursing students were selected for this study. This was a comparative study involving twenty final year nursing students (test group) with simulation on airway management before going to the Emergency and Trauma Department (ETD), versus twenty final year nursing students (control group) posted directly to the Emergency and Trauma Department (ETD) without simulation on airway management. We divided these forty nursing students into two groups mentioned above by draw lots to assure fairness. Both groups were assigned to the Emergency and Trauma Department by batch.

Both the test and control group attended classes and lectures on airway management according to their actual curricular provided by the Health Training Institute. However, the test group was given a simulation training focusing on airway management by the researcher before they went to ETD for clinical experiences. While the test group was undergoing simulation training, the control group was assigned to ETD as the first batch to complete their two weeks of clinical experience. After that, the second batch, which was the test group, was sent to ETD for clinical

experience. By the end of their two weeks of clinical posting in ETD, all forty final year students were required to give their feedback. Efficacy of the simulation training in airway management during resuscitation in the red zone among the test group was assessed by comparing the confidence level before and after they were posted into ETD with the confidence level of the control group before and after their clinical experience in Emergency and Trauma Department.

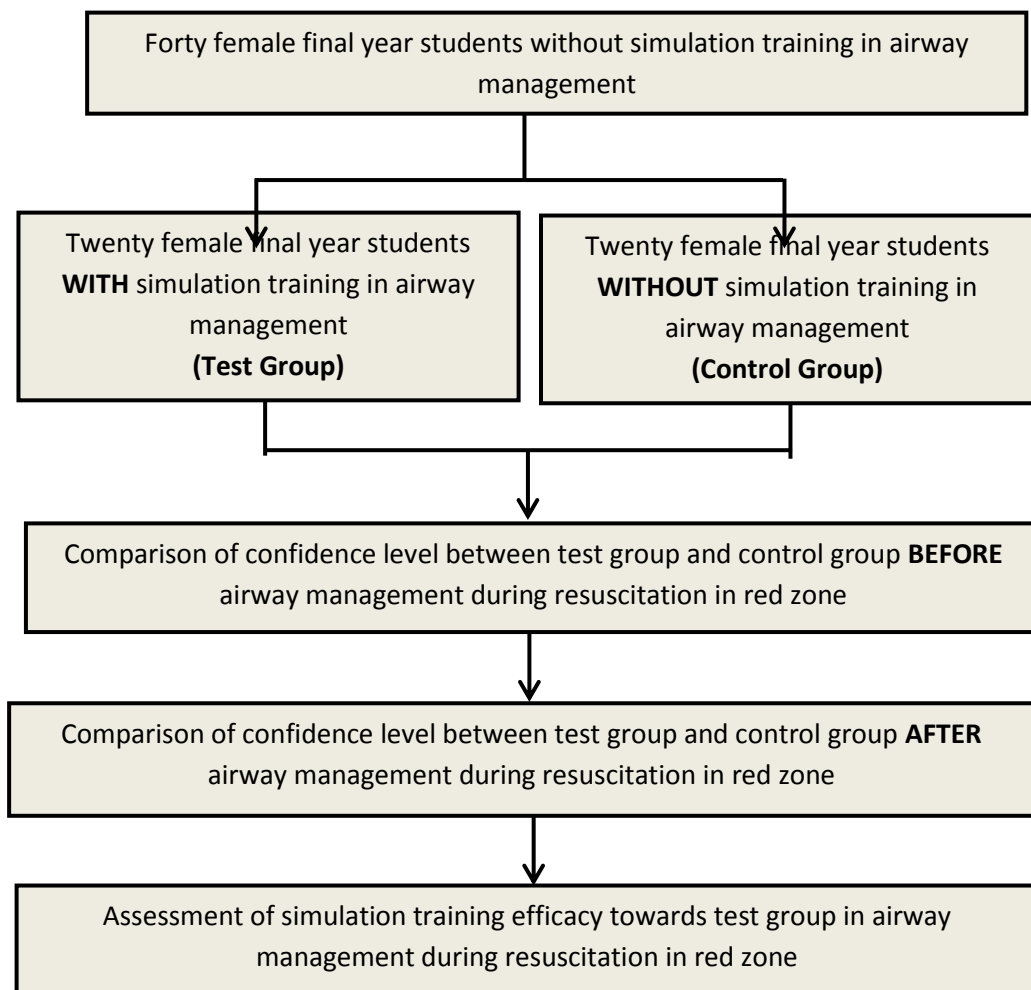


Figure 1.1: Research framework on simulation training efficacy in airway management during resuscitation in red zone among final year ILKMM KK nursing students.

Research instruments: Two instruments were used to assess how well simulation training met student learning needs which were 1) Modified Pre-testPost-test Design Tool, and 2) Simulation Efficacy Tool Modified (SET-M). The two instruments used to assess the efficacy of simulation training in airway management

during resuscitation at red zone explained as below:

The modified pre-test and post-test design was a tool to measure the confidence of third-year undergraduate nursing students for placement into a high-acuity clinical setting (Porter et al., 2013)⁸.

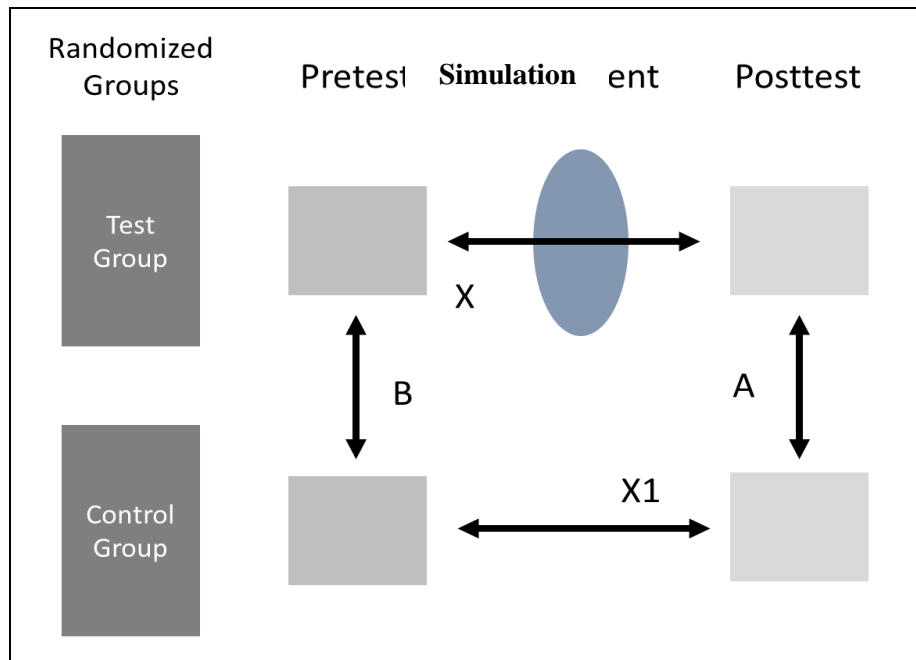


Figure 1. 2: A diagram of the relationship between the test group and the control group design.

Figure 1.2 shows a diagram of the relationship between the test group and the control group design. The design allows researchers to compare the final post-test results between the test and control group. In the role of X and X1, the researcher was able to see both groups changed from pre-test to post-test which shows both or neither improved over time. Comparing the scores in the two pre-test groups can be done to ensure that the randomization process was effective (B).

This survey was designed by Porter et al. (2013); the author and her team was an expert panel consisting of academicians and clinicians⁸. The evaluation tool comprised three sections which reflected collated data relating to (1) participant characteristics including age and gender, (2) self-reported readiness for clinical placement in the Emergency and Trauma Department, and (3) participant confidence level with individual clinical skills.

RESULT

The statistical analysis SPSS version 25.0 was used. First step was to recode the negative items found in question B into positive items. Recode command was used to recode negatively stated items by replacing the original response code into the new response code (recode into the same variables). The negatively stated items were found in the questionnaire used to test for confidence level among the test group as in Appendix F: Modified Pre-test/Post-test survey, questions no 1, 4, 6, 8, and 10 are negatively stated.

After done with the coding process, each component for pre and post-test for the test group was set to transform then compute variables to get the mean. After getting the mean, the skewness test was conducted to identify normal distribution. It is normally distributed as shown in the bell shape histogram. This is to fulfil the assumption for a paired T-test.

- One group of pre-test and post-test of twenty final years nursing students with a convenience sampling technique approach. Students were exposed to the Intensive simulation of airway management technique which includes BLS, measure and insertion of the oropharyngeal, high flow O2 administration; interpret ECG, use of the defibrillator and understanding the role of arrest team during an emergency. The questionnaire on confidence level was given before and after the simulation of airway management. There exists adequate evidence to show that there was a significant difference in the mean score of the pre-test and the mean score of the post-test. The result in table 1 shown significant (CI95% (-0.53414, -0.09586), $t = -3.009$, $df = 19$, $p < .05$).

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Mean SEM – Mean Confident	-.58125	.36075	.08067	-.75008	-.41242	-7.206	19	.000

Table 1 Paired Samples Test shown significant difference in pre and post test.

DISCUSSION

Student nurses that tangled in an arrest situation while on clinical placement require clinical supervision of critical placement. The clinical instructor must be a qualified BLS trainer/ educator. Guide nursing students to verbalize their feelings in handling airway management during resuscitation at the red zone, which “harming the patient,” “making mistakes,” and “feeling unprepared” were described as nursing-student worries. Staffs of the Emergency and Trauma Department need to take part in supervising and mentoring students to participate during resuscitation in the red zone. It is essential to expose students with advances in technology and health care during clinical placement to enhance their It skills.

There is also a need to increase placement opportunities to reduce anxiety among students. Those reported in previous studies consist of many data reflected concern of clinical placement. Feeling “not yet prepared enough;” “as though all the knowledge hasn’t come together;” “anxious about the ... responsibility;” and in a “constant state of panic” were reported by student prior to commencing clinical placement. Students acknowledged that “more clinical placement time” would patronage in calming these fears. Recognize barriers to a clinical placement that may hinder new graduate nurses’ potential to recognize and respond to clinical complexities. This includes hospital consolidations, decreases in the number of nurses willing to serve as preceptors, further constrained due to low patient census, high-acuity patient populations, and safety considerations (Richardson and Claman, 2014)⁹.

An intensivesimulation training program on airway management serves as a bridge on the gap between classroom instruction and practical application. It acts as a reinforcement strategy on the technical and non-technical skills to determine their competency. The most important thing derived from this study is the increases in students' sense of security and confidence before they are exposed to real clinical areas.

Students were excited to get off to the field as soon as possible to apply their skills. Therefore, this program is a stepping stone to prepare them to gain on the real experience. In future research, researcher may suggest a real-world 3D virtual nurse simulation training in airway management. This was a much better learning environment compared to manikins-based simulation training.

A 3D virtual simulation was more realistic and nursing student were able to encounter different kind of emergency situation, this may help them in improving their critical thinking and make fast clinical judgement. A 3D virtual simulation was also very interactive and challenging to the students.

Ethical clearance: Ethical clearance was obtained from the National Medical Research Register NMRR-18-1887-42432. National Medical Research Register (NMRR) was a web-based service initiated by National Institutes of Health (NIH) of the Ministry of Health (MOH) National Institutes of Health (NIH) of the Ministry of Health (MOH).

Conflicts of Interest: There is no conflict of interest in this study.

Fund for the study: This is self-funded study.

CONCLUSION

Intensive simulation training program on airway management serves as a bridge on the breachamid class room teaching and the applied skills. It acts as a reinforcement strategy on the technical and nontechnical skills to determine their competency the most important thing derived from this study is the increases of students' sense of security and confidence before they are exposed to real clinical areas.

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Citation:

Mazlinda Musa, Fidelia Ferderik Anis, Hamidah Hassan., et al.(2020). The efficacy of intensive simulation airway management training program on the final year nursing in one of health training institutions in Northern Borneo, *ijmaes*; 6 (4); 890-898.