

Improving Arterial Blood Gas Collection Skills in Students with SGA Electrical Phantom at Kusuma Husada University, Surakarta

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ABSTRACT

Diagnostic examination using arterial blood gas can be used as a predictor of the cardiopulmonary condition of patients with critical conditions. Having a rapid diagnostic examination will speed up the treatment provided so that the patient survival rate will increase. GDA taking skills need to be trained and require adequate equipment so that researchers make community service with the aim of improving arterial blood gas taking skills in students using SGA Electrical Phantom at Kusuma Husada University, Surakarta. The service design uses Participatory Action Research (PAR) by involving students in carrying out GDA taking skills before and after using the SGA Electrical Phantom. Community Service was carried out at Kusuma Husada University, Surakarta, involving all final semester students with a sample size of 81 people in the Nursing Study Program. Data analysis used the Wilcoxon test. The results of community service show that there is a significant increase in teenagers' skills in BHD with an average value of 70.12 to 83.08 and the Wilcoxon test results obtained a p value of 0.0001

Keywords: Skills, Blood Gas Analysis, Students, SGA Electrical Phantom

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INTRODUCTION

Guideline of hydrogen particle/ H^+ (pH) levels in body liquids is the main perspective in regards to the body's corrosive base equilibrium, on the grounds that any adjustment of pH can cause metabolic and organ capability problems (Bonnemain et al., 2021). The body's acid-base balance mechanism strictly maintains normal H^+ ion levels (blood pH 7.35–7.45) to ensure optimal cell function (Calbay et al., 2019).

Some sickness conditions can cause unsettling influences in the body's corrosive base equilibrium, bringing about a diminishing in the blood pH esteem (acidemia) (Corral, 2020). The condition fundamental this acidemia is called acidosis. Disorders of the metabolic component (metabolic acidosis) or the respiratory component (respiratory acidosis) can lead to acidosis (S). (S. Hong et al., 2022).

Metabolic acidosis is the most well-known corrosive base equilibrium problem found, particularly in basically sick patients (Chang et al., 2019). A conventional approach to disorders of acid-base balance is the foundation for metabolic acidosis, which is characterized by an increase in hydrogen ion levels (a decrease in blood pH) and a decrease in plasma bicarbonate levels, a metabolic component of acid-base balance. Diabetes mellitus, cardiopulmonary, kidney failure, sepsis, external poisoning with salicylates, methanol, and ethylene glycol, as well as 0.9% NaCl infusion (hyperchloremic acidosis) are all potential causes of metabolic acidosis. Mortality and morbidity rates will rise in patients who develop metabolic acidosis during their illness (Benjafield et al., 2019).

Cariopulmonary disease is one disease for which arterial blood pH levels can be used to diagnose the condition. Research consequences of Reyes, Gutierrez and Subitos (2020) shows that as numerous as 30% of the total populace encounters heart failure or unexpected heart failure and 20% experience demise in adulthood. Different illnesses, for example, constant obstructive aspiratory sickness will cause respiratory alkalosis which causes apnea (Reyes et al., 2020). Yeghiazarians' exploration results (2021) show that the quantity of apnea victims arrives at 17-34% in grown-ups and 40-80% are joined by hypertension (Yeghiazarians et al., 2021).

Demonstrative assessment utilizing blood vessel blood gas can be utilized as an indicator of the cardiopulmonary state of patients with basic circumstances (Ryu et al., 2019). Having a quick indicative assessment will accelerate the treatment given so the patient endurance rate will increment (S. I. Hong et al., 2021).

Taking blood vessel blood gases requires great capacity or expertise on the grounds that the area of the conduits isn't not difficult to track down so you want a ton of involvement with taking blood vessel blood (Lee et al., 2022). The exploration consequences of Azimi et al (2021) show that the expertise or capacity scores of attendants in taking GDA (blood vessel blood gas) are 55, 65, 75, 85 and 95 with a typical season of 6-7 minutes in direct estimation. Having an instructional class in taking blood vessel blood gases was demonstrated to expand members' capacity by 47.65% in effectively taking blood vessel blood gases (Azimi et al., 2021).

Benner's theory states that a person's abilities or skills can be gradually directed and developed through regular practice or repetition (Nolan et al., 2021). Expanding the recurrence of clinical abilities will prompt the improvement of nursing capability, yet the advancement of an individual's abilities can't be estimated by how much an individual practices since people have their own transformation frameworks in doing a blood vessel blood gas taking expertise (Padilla et al., 2017).

The ability to collect arterial blood gases is an essential skill for aspiring nurses who are still in the academic or student status. Creating GDA taking abilities should be done by training continuously. The availability of adequate facilities and infrastructure for taking arterial blood

gases must support training or trials in performing skills (Azimi et al., 2021). Preparing to take GDA requires a ghost hand which has practically a similar instrument as a human hand, where while taking GDA the blood vessel blood will promptly ascend all alone without suctioning (Teeter & Haase, 2020).

According to Mauliandari, Sumarwati, & Upoyo, students need a phantom hand that is nearly identical to a real hand in order for them to improve their critical thinking and skill development (Mauliandari et al., 2020). The cognitive abilities of students to comprehend arterial blood gases and to solve problems or make an initial diagnosis based on GDA results can be used to evaluate their critical thinking skills. The results of the students' practical work on taking arterial blood gases can be used to evaluate their ability to take GDA (Panchal et al., 2020).

The ongoing issue is that there is no ghost hand that has practically a similar component as a genuine hand, where blood vessel blood has pressure so blood vessel blood will ascend without anyone else when the needle punctures blood vessel blood. The consequences of a study directed on search media, specifically Google, show that no hand ghost gadget has been found that can apply strain on the veins so that blood can rise consequently into the needle.

Based on the preceding background, researchers are interested in conducting research by developing a novel approach to the production of hand phantoms that keeps up with recent technological advancements or electronic systems. The goal of the study is to create an electric hand phantom that can be used to practice taking venous blood, taking arterial blood gases, and simulating blood pressure checks. The electric phantom that will be produced is known as the SGA-BGA Electrical Phantom and performs three functions simultaneously. So the researcher wants to carry out community service with the title "Improving Arterial Blood Gas Collection Skills in Students Using SGA Electrical Phantom at Kusuma Husada University, Surakarta".

METODE

This technique is utilized as a presentation in giving material and ideas to taking blood vessel blood gases. This strategy is utilized for the purpose of assessment and re-clarification for understudies who don't have any idea or don't comprehend the idea and technique for taking blood vessel blood gases. Wellbeing instruction exercises with reenactments involving SGA Electrical Ghost for Kusuma Husada College Surakarta understudies will be completed on January-Walk 2024. The quantity of test respondents for local area administration was 81 last year nursing understudies.

Local area administration techniques center around preparing strategies. execution of administration to the local area by giving instances of reenactments of involving an electrical apparition for practicum taking blood vessel blood gases, then, at that point, respondents attempted them individually with an appraisal utilizing the blood vessel blood gas taking instrument sheet. The blood vessel blood gas taking apparatus adjusts to the appraisal design as per the stages in the blood vessel blood gas taking practicum.

RESULTS AND DISCUSSION

Execution of local area administration did by the Nursing Study Program, Confirmation Three Program, Personnel of Wellbeing Sciences, Kusuma Husada College, Surakarta, specifically working on the abilities of taking blood vessel blood gases from understudies utilizing SGA Electrical Apparition at Kusuma Husada College, Surakarta. Hung on Walk 1-25 2024 and assessment on April 1-4 2024 in a joint effort with teachers work in crisis and basic consideration.

It was discovered from the outcomes of the one-day implementation of coaching and counseling that 81 students participated in that this activity was well received by students. Understudies become more mindful of how to draw blood vessel blood. This is evident from the results of the pre-test and the post-test. Before the counseling and demonstration of taking GDA with an Electrical Phantom, the skill data for taking GDA had an average value of 70.12, but after the counseling and demonstration, the results of GDA-taking skills had an average value of 83.08. A p value of 0.0001 from the Wilcoxon test indicated that there was a significant increase..

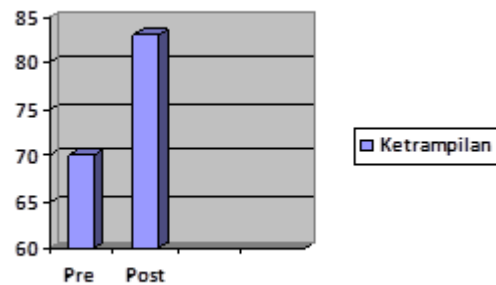


Figure 1. GDA Taking Skills pre and post Test



Figure 2. Training for taking blood gas arterial practicum used electrical phantom



Figure 3. Responden try to taking blood gas arterial with electrical phatom

Recently distributed results propose that the utilization of low-tech test systems might be incapable in further developing nursing understudies' procurement of venepuncture abilities on the off chance that they are not joined with super advanced test systems (Padilla et al., 2017). In

any case, concurring with Reinhardt et al., our review has shown that utilizing low-tech test systems doesn't be guaranteed to keep understudies from acquiring certainty and skill in blood vessel cut (Robba et al., 2020). In point of fact, the low-fidelity simulators, when combined with simulated patients, served to create accurate representations of real-life scenarios. This may have contributed to the observed increase in the proportion of participants who met psychomotor and communication benchmarks (Nolan et al., 2021).

The improvement in members' abilities may likewise have been emphatically affected by different variables. Independent practice may have increased participants' motivation to learn and given them the opportunity to repeat procedures until the skill was mastered; dyad learning may have fostered peer-teaching and peer-observation, reduced the time required for hands-on practice, and increased participants' learning motivation; and finally, intermittent feedback from peers and facilitators may have contributed to correcting errors and consolidating learning gains while minimizing distractions. For example, videos and facilitator demonstrations of procedures on simulators can reduce the cognitive demands that such skill learning (Reyes et al., 2020).

The first workshop that measures competence in terms of knowledge, skills, and self-efficacy for nursing students, as well as the implementation and evaluation of the impact of a simulation-based workshop on arterial puncture. In any case, there are a few restrictions that might restrict the generalizability and understanding of our outcomes. In the first place, the review test was helpfully selected, and that implies that our outcomes can't be summed up to populaces with various attributes. Second, because of hierarchical requirements we can plan one-bunch pretest-posttest learning (Saputro et al., 2021). The absence of results from an examination bunch implies that it is truly challenging to discover whether enhancements in member capability were straightforwardly owing to our instructive mediation. Third, in spite of the fact that we can say that reproduction based studios have added to expanding the extent of members accomplishing capability in blood vessel cut, we can't distinguish what the genuine impact of each instructive technique is on students' skill. At long last, in this review, we couldn't quantify understudies' maintenance of skills and their capacity to move them into clinical practice. As a result, we are unable to guarantee that participants' educational gains from a simulation-based workshop will be sustained over time or that they will be able to demonstrate a comparable level of competency when carrying out procedures on real patients (Mauliandari et al., 2020).

The outcomes show the degree of progress in ability scores in each training, particularly in the initial five stages. Park et al. It was additionally shown that with the expansion in the hour of performing laparoscopic colorectal disease resection medical procedure, the members' skill expanded and the span of the activity and its aftereffects were decreased, particularly in the beginning phases. These outcomes show the significance of the initial steps of medical attendant preparation and its effect in working on their capacities, so administering attendants during their most memorable exact training might be fundamental (Padilla et al., 2017).

Thomas accepts that it is smarter to utilize this strategy for capability, which has complex mental and mental degrees of learning. With respect to multi-faceted idea of nursing training, the utilization of expectations to learn and adapt would be fitting in this field. Moreover, despite the fact that capability levels might ascend in the wake of straightening the expectation to learn and adapt with ability replication, the level of progress rather than the expenses and different outcomes might be extremely slight and the open door medical caretakers might insight to acquire this advancement at later phases of clinical task (Sutiyo et al., 2023). Regular practice can improve skills. Abilities will improve and be proper while rehearsing is upheld by sufficient offices and foundation, both as far as offices and props for completing preparation.

CONCLUSION

The results of community service in the Nursing Study Program, Faculty of Health Sciences, Kusuma Husada University Surakarta show a significant increase in teenagers' skills in BHD with an average value of 70.12 to 83.08 and the Wilcoxon test results obtained a p value of 0.0001. There is a need for monitoring and providing further material so that it can motivate students to be more active and know how to select the right artery and puncture the artery quickly and accurately so that the act of taking arterial blood can be more effective

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