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A Study on the Efficacy of A Formal Teaching Program Regarding the Interpretation of Arterial Blood Gas Values By Critical Care Nurses at A Selected Hospital in Bangalore

Ms. Shalini S

lecturer, Department of medical surgical nursing, Nightingale College of nursing Bangalore RGUHS, Bangalore, Karnataka, India

A B S T R A C T

One of the most straightforward assessments of lung function is arterial blood gas (ABG) analysis, commonly performed in hospitals globally. Properly applying the principles of acid-base imbalance will aid healthcare professionals in tracking the patient's progress and evaluating the quality of care provided. A study was undertaken to evaluate the effectiveness of a structured teaching program aimed at improving critical care nurses' comprehension of arterial blood gas value interpretation at Narayana Hrudayalaya hospital in Bangalore.

Keywords: Knowledge, a structured teaching program, trained nurses, arterial blood gas, and an intensive care unit.

Introduction

Maintaining the hydrogen ion concentration within very precise limits is crucial for the normal functioning of the body's cells. A growing number of critically ill patients in clinical environments experience acid-base imbalances, which can arise from issues in any bodily system. Known clinically as blood pH anomalies, these imbalances occur when hydrogen ion (H+) levels exceed the typical thresholds. Although the body continuously generates acids through metabolic processes, three systems—the respiratory, renal, and buffer systems—work together to maintain pH stability. Bicarbonate is considered the metabolic or renal aspect of arterial blood gas (ABG), while the partial pressure of carbon dioxide represents the respiratory aspect. An arterial blood gas test involves drawing blood from an artery, which requires a syringe and a fine needle to puncture the artery and collect a small blood sample.

OBJECTIVES

1. To evaluate the experimental and control groups of staff nurses' pre- and post-test understanding of ABG analysis.
2. To compare the experimental and control groups' pre- and post-test understanding of ABG analysis.
3. To apply and assess the STP in relation to ABG analysis
4. To determine how certain demographic characteristics relate to the experimental and control groups' knowledge

HYPOTHESES

H1: When comparing the experimental group to the control group, the mean post-test knowledge scores of staff nurses on ABG analysis will be significantly higher.
H2: There will be a significant correlation between post-test knowledge scores and a selected demographic characteristic.

METHODS

A control group design was employed for the pretest and posttest inside a quasi-experimental study framework. Purposive sampling was utilized to choose the sixty staff nurses participating in the trial. The Narayana Hrudayalaya Hospital in Bangalore was designated as the research location. The data collection employed self-reporting, a systematic knowledge evaluation, and demographic data. A pilot research was conducted to ensure clarity, eliminate ambiguity, and assess feasibility for pertinent themes. A statistical analysis was performed to evaluate the experimental outcomes. Graphs were created to illustrate the demographic information of the staff nurses. The relationship between the variables was analyzed using the Karl Pearson Chi-Square test.

MAJOR FINDINGS OF THE STUDY

Nurses aged 20 to 30 constituted 83.3% of the experimental group and 86.7% of the control group, while those aged 31 to 40 accounted for 16.7% in both groups. The experimental group consisted of 73% females and 27% males, whereas the control group comprised 63% females and 37% males. In the experimental group, 86.7% held a GNM degree and 13.3% possessed a BSc. (N), while in the control group, 90% had a GNM degree and 10% had a BSc. (N). Regarding years of experience, 33.3% of the experimental group had 0–1 years, 50.0% had 1–2 years, and 16.7% had 2–3 years. In the control group, 26.7% had 0–1 years of experience, 56.7% had 1–2 years, and 16.7% had 2–3 years. Regarding experience, 93.3% of the experimental group had ICU knowledge, while 6.7% possessed OT experience. The control group had no experience in occupational therapy, and all participants had experience in the intensive care unit. The experimental group's total knowledge rose from 41.50% to 81.93%. In the post-test, 8.0% of staff nurses demonstrated sufficient understanding of ABG analysis, compared to 0.0% in the pretest. The control group exhibited a thorough understanding of ABG analysis, achieving scores of 40.75% in the pretest and 42.00% in the posttest. In the control group, 0.0% possess adequate comprehension of ABG analysis both before and after the test. In the posttest, 2% of the samples exhibited moderate knowledge, 52% demonstrated inadequate knowledge, and 45% displayed moderate understanding. Ninety-eight percent of the samples exhibited sufficient knowledge, indicating improvement following a structured educational program. The experimental group's knowledge scores increased from 16.6 in the pretest to 32.77 in the posttest, signifying a rise in posttest scores. The control group's pretest and posttest knowledge scores were 16.3 and 16.8, respectively, indicating no statistically significant improvement.

INTERPRETATION AND CONCLUSION

The study's results demonstrated that the experimental group's overall knowledge rose from 41.50% to 81.93%. The control group's average knowledge score was 40.75% on the pretest and 42.00% on the posttest. The experimental group had a knowledge variation of 16.6% to 32.77% between the pretest and posttest. The posttest group demonstrated greater knowledge than the pretest group. The control group's overall comparison of pretest and posttest knowledge was 16.3% and 16.8%, respectively, signifying no advancement. The organized training program demonstrated that the experimental group's knowledge rose from 41.50% to 81.93%. The organized educational program yielded a net benefit of 39.08% when comparing the experimental and control groups. Age and years of experience are significant factors influencing posttest knowledge, as demonstrated by the link between demographic variables and knowledge in both groups. Staff members with greater experience and age had higher knowledge levels in the posttest of the experimental group. The knowledge levels in the control group's pretest and posttest do not significantly correlate with any demographic characteristics. In the 20–30 age range, the experimental group represented 83.3%, while the control group accounted for 16.7%. The present investigation revealed that, during the pretest assessment, the competence of staff nurses in both the experimental and control groups for arterial blood gas analysis was inadequate. Conversely, the posttest results for the experimental group indicated an improvement in staff nurses' knowledge, yielding a noteworthy score. The improvement in knowledge levels can be attributed to the implementation of the structured educational program. Thus, continuous education and professional growth can enhance staff nurses' understanding.

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