



Medical Surgical Nursing

“EFFECTIVENESS OF SELF-INSTRUCTIONAL MODULE ON KNOWLEDGE REGARDING ARTERIAL BLOOD GAS ANALYSIS AND ITS INTERPRETATION AMONG ICU STAFF NURSES WORKING IN SELECTED HOSPITALS OF BANGALORE, KARNATAKA”.

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ABSTRACT

Background: Arterial blood gas (ABG) analysis is an essential part of diagnosing and managing a patient's oxygenation status and acid–base balance. Disorders of acid–base balance can create complications in many disease states, and occasionally the abnormality may be so severe so as to become a life-threatening risk factor. A thorough understanding of acid–base balance is mandatory for any health care professional is no exception. The aim of the study was to assess the knowledge of ICU staff nurses regarding ABG analysis and interpretation. **Methods:** Pre experimental design of one group pre and post test group design was selected for the study. Evaluative approach was adopted for the study. The participants were 60 staff nurses from the selected hospital, Bangalore. Using Purposive sampling technique samples were selected. A structured knowledge questionnaire was used to collect data from the subjects. **Results:** Findings of the study revealed that in pretest, 52(86.6%) samples were having inadequate knowledge, 8(13.3%) samples were having moderate knowledge and none of them were having adequate knowledge. But in post test, 7(11.7%) samples were having moderate knowledge, 52(86.7%) samples were having adequate knowledge and none of them were having inadequate knowledge. The statistical paired 't' test implies that the difference in the pre test and post test knowledge score found statistically significant at 0.05 level. The post test mean knowledge enhancement was 14.8% with a paired 't' value of 56.5. Thus, it indicates that the self instructional module is effective in improving the knowledge of staff nurses. The association was found between the knowledge scores of ICU staff nurses with demographic variables such as age, gender, educational qualification, years of clinical experience and previous workshops attended which was significant at the level of 0.05. It is recommended that similar study can be conducted on larger sample to arrive at generalization. **Conclusion:** Hence, it is important that nurses are familiar with the information obtained to be able to detect the disturbances in ventilation, oxygen delivery and acid–base balance.

KEYWORDS : ABG, ICU, Staff nurses, Self Instructional Module.

INTRODUCTION

Acute respiratory failure is a severe complication of respiratory illnesses such as chronic obstructive pulmonary disease (COPD), asthma and pneumonia. It generates a significant healthcare burden, contributing to high in-hospital mortality ranging between 13% and 39%, and is the most common cause of organ failure responsible for admission to intensive care units. Acute respiratory failure can be divided into two categories based on the presence or absence of hypercapnia. Appropriate evaluation for hypoxemia and hypercapnia is essential to allow the provision of appropriate ventilator support and oxygen therapy and, thus, achieve the best patient outcomes. Therefore, accurate measurement of ABG is essential for timely identification and management.

ABG analysis can be fun and exciting, as well as an important tool for patient care. Acid-base imbalances are associated with various clinical conditions. Using ABGs as an assessment tool, the PACU nurse can determine the patient's acid-base status and initiate prompt, appropriate nursing intervention and medical consultation.

The arterial blood gas (ABG) analysis, one of the most common tests ordered, provides clinicians with valuable information on a patient's oxygenation and acid-base balance. Interpreting ABG analysis results can be challenging, even for the most experienced practitioners, because it requires knowledge of the physiology and cause-and-effect relationship of the disturbances. Applying the principles and the ABG algorithm described, will provide nurses with a systematic way to interpret uncomplicated arterial blood gas results, including primary, mixed, and compensated acid base disturbances.

In a critical care setting, a patient's condition can change rapidly and dramatically. Using a four-step approach to ABG interpretation can identify an acid–base disorder quickly and accurately, which help intervene appropriately. If patient is mechanically ventilated, good ABG interpretation skills can guide clinicians and nurses in adjusting the ventilator settings to meet the patient's needs. The arterial blood gas (ABG) is frequently used for monitoring the patient's respiratory status and ABGs can be sampled as an arterial stab or by drawing blood from an arterial line. Knowledge about interpretation of ABGs is consequently essential for nurses who are working in ICU, to be able to analyze each component of the ABGs to avoid overlooking a change that could result in an inaccurate interpretation and lead to inappropriate treatment. All over the world nurses in ICU use considerable time in drawing, documenting, reporting and interpreting blood gases.

Objectives Of The Study

- To assess the pretest knowledge score regarding ABG analysis and its interpretation among ICU staff nurses.
- To evaluate the effectiveness of self instructional module on knowledge regarding ABG analysis and its interpretation among ICU staff nurses.
- To find out the association between Pretest knowledge score of ICU staff nurses regarding ABG analysis and its interpretation and selected demographic variables

Hypothesis

H1:- There will be significant difference in the mean pre test and post test knowledge score regarding ABG analysis and its interpretation among ICU staff nurses.

H2 :- There will be significant association between pre test knowledge score regarding ABG analysis and its interpretation and selected demographic variables

Assumptions

Self instructional module may enhance the knowledge on ABG analysis and its interpretation among ICU staff nurse.

METHODS AND MATERIAL

An evaluative research approach was used in order to assess the effectiveness of self instructional module regarding arterial blood gas analysis and its interpretation among staff nurses working in Intensive care unit. Pre experimental design of one group pre and post test group design was selected for the present study. The independent variable was SIM on ABG analysis and its interpretation among ICU nurses and the dependent variable was knowledge among ICU nurses. The setting of the study was selected hospital at Bangalore, Karnataka state. Purposive sampling technique was used to select the subjects. The sample size was 60 ICU nurses. The tool consists of two parts.

Part I: It deals with demographic variables such as age, sex, Educational Qualification, years of experience, Religion, Marital status and workshops attended.

Part II: It consists of structured knowledge questionnaire to assess the knowledge regarding ABG analysis and its interpretation among staff nurses working in ICU. It consists of 30 items. For each questionnaire, four options were given and only one correct answer. For each correct answer, the score given was 1 and for the wrong answer, the score given was 0. The highest score was 30.

RESULT

In pre test majority 52(86.6%) of them had inadequate knowledge,

8(13.3%) of them had moderate knowledge and none of them had adequate knowledge. In post test, majority 52(86.6%) of the subjects had adequate knowledge, 7(11.7%) of them had moderate knowledge and 1(1.7%) of them had inadequate knowledge.

In relation to knowledge, the mean pre-test knowledge score was 6.8 with the standard deviation 3.4 and post-test score was 21.3 with the standard deviation 3. The mean difference was 14.8. The obtained 't' value 56.5 was statistically significant at $p < 0.05$ level. Significant association was found between the pretest knowledge scores with demographic variables such as age, gender, educational qualification, years of clinical experience and previous workshops attended. Therefore it is proved statistically that SIM was effective to improve the level of knowledge of ICU nurses.

Table 1: Frequency And Percentage Distribution Of Pre-test And Post-test Level Of Knowledge Among ICU Staff Nurses N=60

S. No	Level of Knowledge	Pre Test Knowledge Score		Post Test Knowledge Score	
		Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
1	Inadequate	52	86.6	1	1.7
2	Moderate	8	13.3	7	11.7
3	Adequate	0	0	52	86.6
Total		60	100.0	60	100

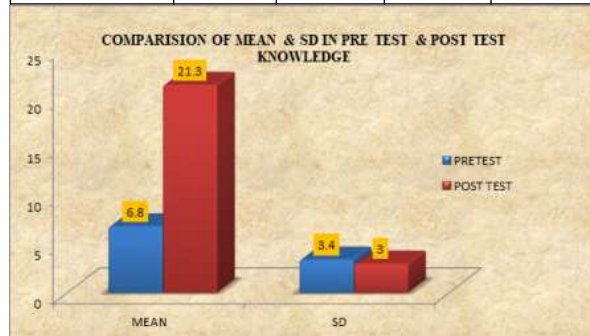


Fig.1. Bar Diagram Showing Mean & SD Of Samples In Pre And Post Test

DISCUSSION

1. Findings Related To Demographic Variables

With regard to the age, majority of the samples 36 (60%) were in the age group of 20-25 years. Majority of the subjects 45(75%) were Hindus. In relation to gender, majority of them were females 48(80%). With regard to the educational qualification, majority 27(45%) of the respondents were B. Sc nurses. Considering the years of experience, 27(45%) of the respondents have experience between 1-2 yrs. In relation to marital status, most of the respondents 41(68%) were unmarried. Regarding the workshops attended, 54(90%) nurses were not attended workshops related to ABG analysis and its interpretation.

2.findings Related To Assessment Of Pretest And Post Test Knowledge Of Staff Nurses Regarding ABG Analysis And Its Interpretation.

In pre test majority 52(86.6%) of them had inadequate knowledge, 8(13.3%) of them had moderate knowledge and none of them had adequate knowledge. In post test, majority 52(86.6%) of the subjects had adequate knowledge, 7(11.7%) of them had moderate knowledge and 1(1.7%) of them had inadequate knowledge.

3.findings Related To Comparison Of Pretest And Post Test Knowledge On ABG Analysis And Its Interpretation

The mean post-test knowledge score (20.6) is higher than the mean pre-test knowledge score (14.9). The Computed 't' value $t_{(49)} = 15.5$ shows that there is a significant difference between the pre-test and post-test mean knowledge score. This indicates that Self instructional module was effective in increasing knowledge level of subjects on ABG analysis and its interpretation among ICU staff nurses.

4. Findings Related To Association Between Pretest Knowledge Score And Selected Demographic Variables

Findings revealed that there is no significant association between selected demographic variables such as religion and marital status and there is a significant association between selected demographic variables such as age, gender, educational qualification, years of

clinical experience and previous workshop attended.

CONCLUSION

Interpreting an arterial blood gas (ABG) is a crucial skill for nurses. ABG interpretation is especially important in critically ill patients. Disorders of acid–base balance can lead to severe complications in many disease states, and occasionally the abnormality may be so severe as to become a life-threatening risk factor. The process of analysis and monitoring of arterial blood gas (ABG) is an essential part of diagnosing and managing the oxygenation status and acid–base balance of the high-risk patients, as well as in the care of critically ill patients in the Intensive Care Unit. Since both areas manifest sudden and life-threatening changes in all the systems concerned, a thorough understanding of acid–base balance is mandatory for nurses.

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