"A Study to Assess the Effectiveness of Structured Teaching Program on Knowledge Regarding ABG Analysis and Interpretation Among the Student Nurses Studying in Sri Venkateshwara College of Nursing Sciences, Bangalore"

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ABSTRACT

Background : An arterial blood gas (ABG) tests explicitly blood taken from an artery. ABG Analysis assesses a patient's partial pressure of oxygen and carbon dioxide. PaO2 provides information on the oxygenation status, and PaCO2 offers information on the ventilation status. Although oxygenation and ventilation can be assessed non-invasively via pulse oximetry and end-tidal carbon dioxide monitoring, respectively, ABG Analysis and Interpretation is the standard. Understanding and use of blood gas analysis enable providers to interpret respiratory, circulatory, and metabolic disorders. **Method**: An evaluative approach was used for this study. The design used for this study was one group pre-test and post-test design. Sample size was 30. The samples were selected by non-randomized purposive sampling technique. The self-administered questionnaire was constructed and validated by the experts. **Results and Discussion:** The collected data were analysed using descriptive and inferential statistics. The paired 't' value 12.09 showed that the post-test level of knowledge of the samples was higher than the pre-test level of knowledge which was significant at $p < 0.05$ level. The result of the study concluded that the structured teaching program given was effective in improving the level of knowledge among the nursing students.

KEYWORDS: ABG analysis, Knowledge, Student Nurses, Structured teaching program.

INTRODUCTION

An arterial blood gas test, or arterial blood gas analysis measures the amounts of arterial gases, such as oxygen and carbon dioxide in the blood. An ABG test measures the blood gas tension values of the arterial partial pressure of oxygen (PaO2), and the arterial partial pressure of carbon dioxide (PaCO2), bicarbonate levels , blood saturations and the blood's pH. Such information is vital when caring for patients with critical illnesses or respiratory disease. Therefore, the ABG test is one of the most common tests performed on patients in intensive-care units. In other levels of care, pulse oximetry plus transcutaneous carbon-dioxide measurement is a less invasive, alternative method of obtaining similar information.

Patients with sepsis (i.e., infection with organ dysfunction) and cardiorespiratory failure are at the risk of metabolic complications, which could be detected through arterial blood gas (ABG) analysis. The objective of this study was to review: (a) the profile of metabolic abnormalities detected by ABG in patients with clinically suspected sepsis, (b) Correlate ABG profiles with patient outcomes such as mortality, length of the hospital stay and length of the intensive care unit (ICU) stay, (c) correlate ABG with microbiology of positive blood cultures, (d) correlate ABG with organ failures in sepsis and (e) correlate ABG with health-care cost. In conclusion, this small pilot study indicates the value of ABG as a cost effective and rapid (~5 min from sample collection to reporting) diagnostic, monitoring and prognostic tool in the clinical management of patient with sepsis.

The nurses need expert knowledge for the effective sample collection and interpretation of results. Thereby the research was planned to conduct a study by assessing the existing knowledge of ABG Analysis and Interpretation among student nurses and to give them knowledge through the structured teaching programme.

NEED FOR THE STUDY

Arterial blood gas analysis has become an essential skill for all healthcare practitioners. It provides important information with regard to adequacy of ventilation, oxygen delivery to the tissues and acid-base balance. If the nurse having proper skill regarding arterial blood gas analysis can able to provide appropriate nursing intervention, and medical consultation.

Arterial blood gas analysis can be complex. However, in many clinical areas the nurse is one of the first to see the results. So they need to know whether immediate actions required, this articles stated that guideline for ABG interpretation is useful to the nurses even when all the complexities are not fully understood.

Assess the effectiveness of teaching module specific to arterial blood gas interpretation among the staff nurses of health memorial hospital at Germany, they found that staff nurses' knowledge is increased significantly after viewing the teaching module they concluded that the teaching module is necessary to provide continuing education to nurses.

The researcher had the assumption that the student nurses will have limited knowledge on ABG Analysis and Interpretation and wanted to improve their knowledge level to make them good in the procedure.

OBJECTIVES

➢ To assess the pre-test level of knowledge regarding ABG Analysis and Interpretation among the student nurses.

➢ To assess the post-test level of knowledge regarding ABG Analysis and Interpretation among the student nurses.

➢ To compare the pre-test and post-test level of knowledge regarding ABG Analysis and Interpretation among the student nurses.

➢ To find out the association between the posttest level of knowledge regarding ABG Analysis and Interpretation among student nurses with their selected demographic variables.

METHODS:

RESEARCH APPROACH

An evaluative approach was used for this study.

RESEARCH DESIGN

The research design selected for the study was one group pretest and posttest design.

RESEARCH SETTING

The study was conducted in Venkateshwara Nursing College, Bangalore.

POPULATION

In this study the target population was the student nurses studying in Venkateshwara Nursing College, Bangalore.

SAMPLE

The student nurses studying in 4th year B.Sc Nursing were involved in the study.

SAMPLE SIZE

Sample size was 30.

SAMPLING TECHNIQUE

Non randomizes purposive sampling was used to select the sample for the study.

INSTRUMENT AND SCORING PROCEDURE

The tool consists of two parts,

PART-I- DEMOGRAPHIC VARIABLES

It consists of demographic variables such as age, sex, educational status, area of living, previous knowledge regarding ABG analysis, Source of knowledge.

PART-II- SELF- ADMINISTERED QUESTIONNAIRE

It is used to assess the level of knowledge of student nurses regarding ABG analysis and interpretation. The questionnaire consists of 15 questions with 4 options, in which 3 options are wrong and 1 is right.

SCORING PROCEDURE

Score was interpreted as follows

LEVEL OF KNOWLEDGE SCORE	GRADE
BELOW 50 %	Inadequate
51- 75%	Moderate
76- 100%	Adequate

PROTECTING THE HUMAN SUBJECTS

Oral Consent was obtained from each participant was obtained after explaining the purpose of the study before collecting the data. the permission was obtained from the Principal, College of Nursing. Confidentiality of the information was maintained.

DATA COLLECTION PROCEDURE

The study was conducted in Venkateshwara College of Nursing, Bangalore for a period of 1 week. The written permission was obtained from Principal, Venkateshwara College of Nursing, Bangalore and oral permission was obtained from each study participants prior to the study. Purpose of the study was explained to the participants. Samples were chosen by simple random sampling technique. The fourth year B.SC Nursing students were selected for the study. 30 samples were selected to participate in the study. Data collection was done by Self-administered Questionnaire. On the first day of data collection self-introduction about the researcher was given and the pretest knowledge questionnaire was given and data was collected. On the same day structured teaching programme was given on ABG Analysis and Interpretation using Power point presentations. On the 7th day Post-test knowledge questionnaire was given and the data were collected. Data obtained was tabulated, analysed by using descriptive and inferential statistics.

RESULTS

TABLE 1*:* Comparison of pre-test knowledge score and post-test knowledge score regarding ABG Analysis and Interpretation among student nurses.

LEVEL OF KNOWLEDGE	PRETEST		POST TEST	
	F	%	F	%
Adequate Knowledge			29	96.7
Moderately adequate Knowledge			1	3.3
Inadequate Knowledge	30	100		
Total	30	100	30	100

The Table 1 shows that the 100% of samples had inadequate knowledge in pretest and 96.7 % had adequate knowledge in posttest.

TABLE 2: Comparison of mean score, standard deviation and independent 't' test value of pre-test and post-test knowledge scores regarding ABG Analysis and Interpretation among student nurses.

S.No	Variables	Mean	SD	't'	Table Value
1	Pre test	5.16	1.92	12.096	2.045
2	Post test	10.9	1.93		

df=29, p<0.05

Table 2 depicts that the mean score of post-test 10.9 is higher than the mean pre-test score 5.16. The independent 't' value is 12.096 which is significant at p<0.05 level.

DISCUSSION

      The data analysis showed that the paired 't' value was 12.096 which was significant at < 0.05 level. The Chi square values calculated to find the association between the level of knowledge and the demographic variables revealed that there was no significant association with their selected demographic variables.

      Arterial blood gas (ABG) analysis is an essential investigation for assessing clinical oxygenation and acid-base status in critically ill patients. Since the nurses and student nurses in critical care units are more involved in ABG interpretation as well as caring patients on ventilation, they have more knowledge. The purpose of the study was to assess the effectiveness of structured teaching program on knowledge regarding arterial blood gas analysis among nursing students. Methods and Materials: A Quasi-experimental study design was conducted among Nursing Students of LMCTH (Lumbini Medical College and Teaching Hospital). A total of 65 respondents were participated using Census enumeration method. Data was collected

through structured pre-tested (r=0.7) questionnaire. Data was first entered, coded and analysed by using SPSS V20. Descriptive and inferential statistics were used. Results: Findings of this study revealed that during pre-test, majority of the respondents (70.8%) had average knowledge, only 15.3% of respondents had adequate knowledge and 13.9% had inadequate knowledge whereas during post-test majority of the respondents (63.1%) had adequate knowledge, 35.4% had average knowledge and only 1.5% had inadequate knowledge regarding Arterial Blood Gas analysis. Structured teaching program was highly significant at p value <0.001. There was significant association between age, educational level, exposure to critical areas and level of knowledge score on pre and post-test. Conclusion: The study concluded that the mean post-test knowledge score (28.38) was higher as compared with the pre-test score (23.46). Thus, structured teaching program was effective in improving the level of knowledge of nursing students.

CONCLUSION

The present study assessed the effectiveness of structured teaching programme on ABG Analysis and Interpretation and its Interpretation on the level of knowledge among the student nurses in Venkateshwara College of Nursing, Bangalore. The 't' value 12.09 showed that the post-test level of knowledge was higher than the pre-test level of knowledge which was significant at p,0.05. The result of the study concluded that the intervention given was effective in improving the level of knowledge among the student nurses.

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