

A Study to Assess the Effectiveness of Structured Teaching Programme on Knowledge Regarding Arterial Blood Gas Sampling Technique Among Staff Nurses

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Abstract: *Maintaining proper hydrogen ion (H⁺) concentration within a restricted range is essential for normal bodily cell function. Fluctuations in H⁺ levels result in acid-base disturbances and imbalance, manifesting as abnormal blood serum pH level and arising from issues within our any bodily system. These disturbances are frequently observed in clinical environments. Aim of the study is to assess the STP effectiveness on knowledge of ABG sampling technique among staff nurses of Moradabad hospitals. Purposive sampling technique was chosen for the data collection was structured knowledge questionnaire which comprised of seven items in demographic data, 41 items on knowledge regarding all parameters of ABG sampling. The tools reliability was formed by Internal consistency method. The pre-test was administered to 50 staff nurses followed by STP, post-test is conducted after 7 days using same tools. The overall pre-test and post-test mean% was 45.07% and 78.73% percent with an enhancement of 74.69%. At the time of pre-test 86% staff nurses had insufficient knowledge; 14% had average Knowledge and no any staff nurses had sufficient knowledge in pre-test. In post-test 48 (96%) staff nurses had sufficient knowledge; 2 (4%) staff nurses had average knowledge and no any staff nurses had insufficient knowledge in post-test.*

Keywords: ABG analysis, Staff nurse, Structure teaching programme, Knowledge, clinical settings

1. Introduction

The body's acid base balance is properly measured or checked at clinical setting by using series of measurement of arterial blood gases (ABGs) sampling techniques, the parameters of ABGs sampling are PH, PaCo₂ and HCo₃. These values used to identify the presence of type of acid base imbalances and assess the compensation level. These acid base imbalances are also associated with other disease conditions that cause respiratory acidosis and alkalosis, Metabolic acidosis and alkalosis. By ABG analysis we can easily find out these conditions.

Acidosis is any pathological process that causes increases the level of acid in the body, academia means increase level of acid in the blood. The presence of academia does necessarily

confirm the pathological process technically. The same variations also present between the alkalosis and alkalemia, alkalosis indicates a primary condition resulting in increased level of base in body and alkalemia means increase of blood pH level.

2. Aims and Objectives

Aims

A study to assess the effectiveness of structured teaching programme on knowledge regarding arterial blood gas sampling technique among the staff nurses who are working in selected hospitals of Moradabad, U.P.

Objectives

- 1) To assess the pre-test knowledge level of staff nurses' regarding arterial blood gas sampling technique.
- 2) To assess the post-test knowledge level of staff nurses' regarding arterial blood gas sampling technique.
- 3) To see the differences of knowledge level of staff nurses in pre-test and post-test after intervention.
- 4) To assess the effectiveness of STP on arterial blood gas sampling technique.
- 5) To assess the association between pre-test level of knowledge with their demographic variables.

3. Methodology

Target population: Staff nurses working in TMU hospital, Moradabad

Sample: 50 staff nurses working in TMU hospital, Moradabad

Sampling technique: Purposive sampling technique

Research approach: Evaluative research approach

Research design: Experimental design (A group pre-test, post-test design)

Tool:

- a) Self –structured knowledge questionnaire to assess the knowledge of staff nurses
- b) Prepared structured teaching programme on ABG sampling technique

Method of data collection: structured knowledge questionnaire method

Data analysis: 't' test and chi square test

Sampling criteria

The sampling well organized by the researcher consists of the following criteria:

Inclusion criteria

- Staff nurses working in selected hospital at Moradabad.
- Staff nurses who are willing to participate in the study.
- Staff nurses who are available at the time of data collection.

Exclusion criteria

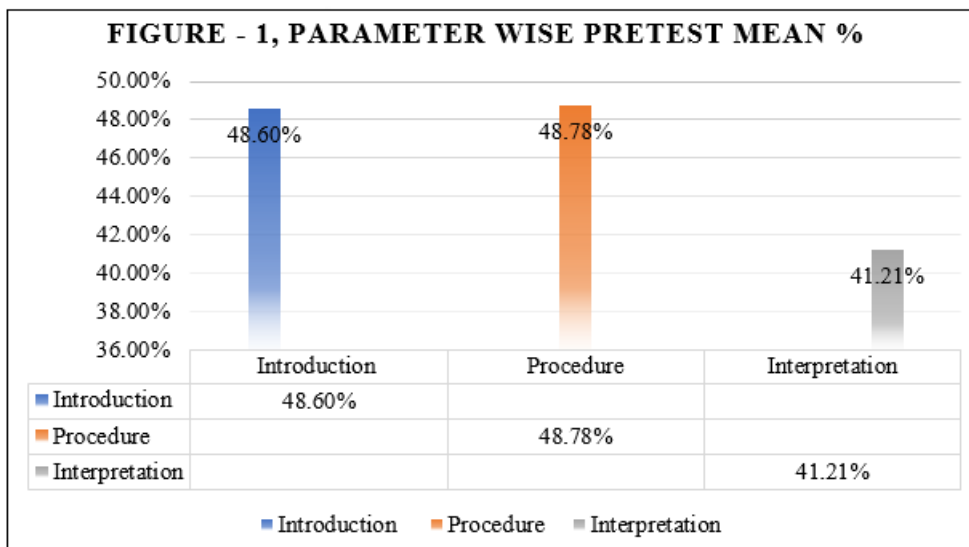
- Staff nurses who are not willing to participate in the study.
- Staff nurses who are not available at the time of data collection.

4. Results

Parameter wise allocation of scores during the pre-test and post-test.

Table 1: Parameter wise Pre-test mean percentage knowledge scores on ABG sampling technique, N=50

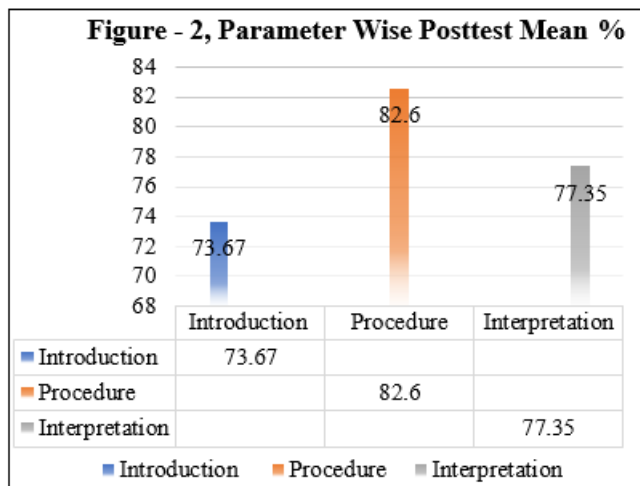
S. No.	Knowledge aspects	Statement	Mean	Mean %	SD
1	Introduction	6	2.92	48.60%	1.02
2	Procedure	15	7.32	48.78%	1.42
3	Interpretation	20	8.24	41.21%	2.25
	Overall	41	18.48	45.07%	4.66



The above **table-1** and **fig-1**, present that the highest mean percent 48.78% knowledge score achieve in parameter of procedure, 48.60% mean percentage knowledge score on parameter of introduction and 41.21% mean percentage knowledge score on parameter of interpretation of ABG sampling technique. On the other hand, the overall pre-test mean percentage knowledge score was found to be 45.07% and standard deviation was 4.66 group of the respondents.

Table 2: Parameter wise post-test mean percentage knowledge scores on ABG sampling technique, N=50

S. No.	Knowledge Parameters	Statement	Mean	Mean %	SD
1	Introduction	6	4.42	73.67	1.40
2	Procedure	15	12.39	82.60	1.06
3	Interpretation	20	15.47	77.35	0.87
	Overall	41	32.28	78.73	1.45

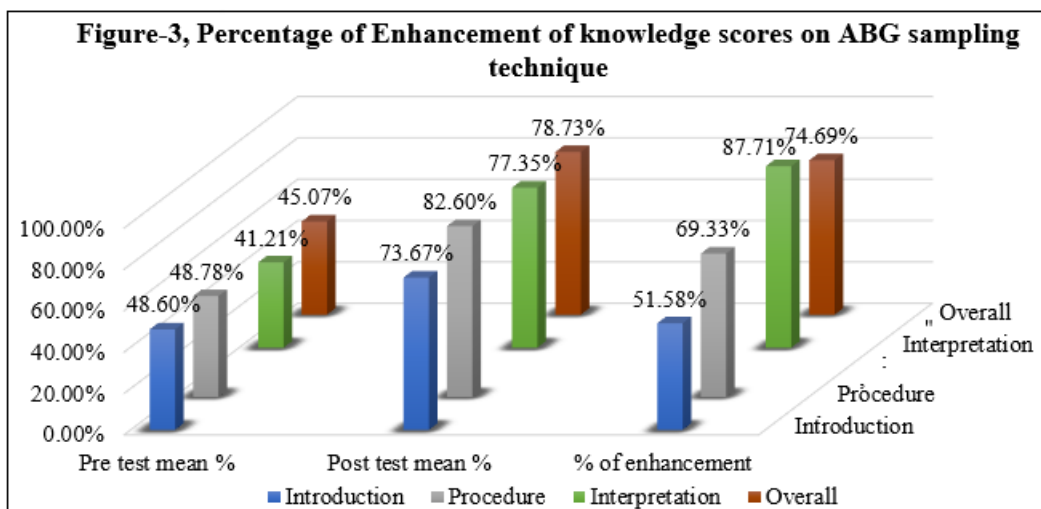


The above table – 2, and fig – 2, present that the highest 82.60% knowledge score was obtained in procedure, 73.67% knowledge score on introduction and 77.35% in interpretation of the parameter of ABG sampling technique. On the other hand, the overall Post- test mean percentage knowledge score was found to be 78.73% and standard deviation as 1.45 among the respondents.

Parameter wise analysis between pre-test and post-test knowledge scores.

Table 3: Parameter wise enhancement of knowledge scores on ABG Sampling Technique.

Knowledge Parameter	Pre-test			Post-test			Percentage of Enhancement
	Mean	Mean%	SD	Mean	Mean%	SD	
Introduction	2.92	48.60%	1.02	4.42	73.67	1.40	51.58%
Procedure	7.32	48.78%	1.42	12.39	82.60	1.06	69.33 %
Interpretation	8.24	41.21%	2.25	15.47	77.35	0.87	87.71 %
	18.48	45.07%	4.66	32.28	78.73	1.45	74.69 %

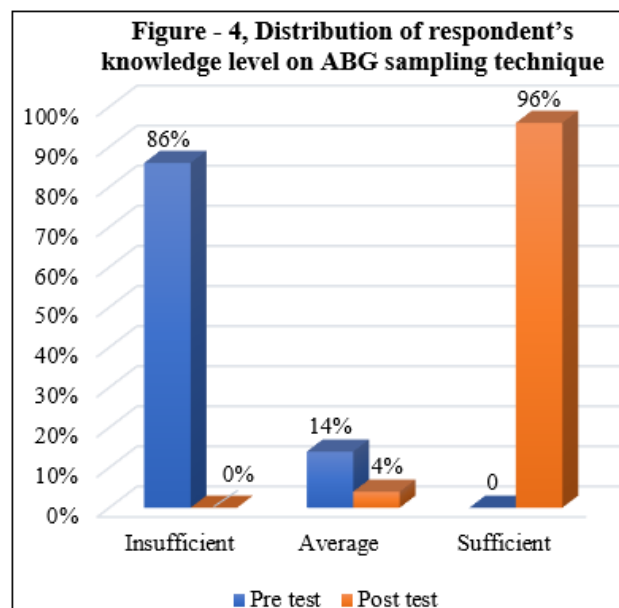


The above table-3, and figure-3, Shows that the highest enhancement of knowledge 87.71% was seen in the Parameter of interpretation with the pre-test and post-test of 41.21% and 77.35%. In the parameter of introduction 51.58% of enhancement was seen with 48.60% as the mean pre-test score and 73.67% in post-test. Where as in the parameter of procedure 69.33% of enhancement was seen with pre-test 48.78% and post-test 82.60%. The overall pre-test and post-test mean% was 45.07% and 78.73% percent with an 74.69% enhancement.

Comparison Between Pre-test and Post-test Knowledge Level Wise

Table 4: Distribution of respondent’s knowledge level on ABG Sampling Technique

Knowledge level	Classification of respondents			
	Pre test		Post test	
	Number	Percentage	Number	Percentage
Insufficient	43	86%	00	00%
Average	7	14%	02	04%
sufficient	00	00	48	96%



Data in **table–4**, and **figure–4**, shows that the knowledge of staff nurses regarding ABG sampling technique. In the pre-test 86% staff nurses have insufficient knowledge; none of the staff nurses had sufficient knowledge in pre-test. In post-test

48 (96%) staff nurses had adequate knowledge; 2 (4%) staff nurses had average knowledge and none of the staff nurses had inadequate knowledge in post-test.

Table 5: Comparison of pre-test post-test knowledge score with t-value, N = 50

Knowledge aspect	Pretest mean \pm SD	Posttest mean \pm SD	Mean differences	t-value	df	P value
Overall score	18.48 \pm 4.66	32.28 \pm 1.45	13.80	20.00	49	<0.001

With a calculated t-value of **20.0**, well above the critical threshold for 49 degrees of freedom, the leap in knowledge scores isn't just a fluke; it's a clear win. The data shows a definitive, statistically significant improvement, proving that the structured teaching program really hit the mark in helping staff nurses in ABG sampling techniques.

5. Conclusion

In the present study 43(86%) of staff nurses had insufficient knowledge, 07(14%) of staff nurses had average knowledge. None of the staff nurses had sufficient knowledge before the implementation of the structured teaching programme, after implementation of the STP 4% staff nurses had average knowledge and 96% (48) of them had sufficient knowledge and no one had inadequate knowledge.

The mean post test scores of all parameters are higher than the mean pre-test scores which are significant at ($p < 0.05$). The collectively mean post test score 32.28 that is higher than the mean pre-test score 18.48 which indicates that the structured teaching programme among staff nurses was effective, which is statistically significant at ($p < 0.05$).

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