



Effect of Planned Teaching Program on the Knowledge Regarding Arterial Blood Gas Interpretation and Selected Nursing Measures Among Staff Nurses of Selected Hospitals of Moradabad, UP.

Nafees Ahmed¹, Junaid², Farha Usmani³, Gaurav Kumar⁴, Kamaldeep Kaur⁵

¹Assistant Professor, Department of Medical Surgical Nursing, TMCON, TMU, Moradabad – 244001, ²Staff Nurse TMH&RC, TMU, ³Associate Professor Gs college of Nursing

Pilkhuwa, Hapur 245304, ⁴Assistant Professor, Department of community Health Nursing, TMCON, TMU Moradabad,

⁵Assistant Professor, Department of community Health Nursing, TMCON, TMU Moradabad

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KEYWORDS

Planned teaching programme, Knowledge, Effectiveness, ABG, Staff nurses.

Abstract

Background of the study: Arterial blood gases (ABG) analysis is a blood test indicating ventilation, gas exchange, and acid-base status in blood taken from the artery. It entails puncturing an artery with a thin needle and a heparinized syringe and taking a small amount of blood (approximately 1ml). The radial artery at the wrist is the most usual puncture location but the femoral artery in the groin or other sites are also used. An arterial catheter can also be used to take blood. Arterial blood gas analysis is a critical investigation for determining clinical oxygenation and acid-base status in critically ill patients. Objective:(1) To assess the level of knowledge regarding arterial blood gas interpretation among nurses before planned teaching programme, (2) To assess the level of knowledge regarding arterial blood gas interpretation among nurses after planned teaching programme, (3) To find out the effectiveness of planned teaching programme on arterial blood gas interpretation among nurses. Aims: The main aim of the study was to evaluate the effectiveness of planned teaching programme regarding ABG interpretation among the staff nurses. Method: This study was carried out in Teerthanker Mahaveer University Hospital, Moradabad, and U.P. The Pre-experimental (one group pre-test-post-test) design was used in this study. The sample consisted of 80 staff nurses, who were chosen through non- probability convenience sampling technique. Data was collected by administering the self-structured questionnaires. The collected data was organized in master data sheet and analyzed using descriptive and inferential statistics as per objectives of the study, using SPSS version 20. Results: Pilot study result showed that in pre-test 50% had inadequate knowledge, 50% had moderate knowledge, no body had adequate knowledge whereas in post-test 62.5% had adequate knowledge, 37.5% had moderate knowledge and no one had inadequate knowledge. The mean post-test score (34.37) was more than mean pre-test score of (22.62) with a mean variation of (11.75). Hence, it concluded that the planned teaching programme was significantly effective to enhance the knowledge of staff nurses regarding ABG interpretation. The main study findings revealed that the majority of knowledge score of pre-test and post-test. Majority of participants 45 (55%) had inadequate knowledge, 36(45%) had moderate knowledge in pre-test, but after the intervention, there was a significant increase in post-test scores that majority of participants 71 (88.8%) had adequate knowledge, 9 (11.3%) had moderate knowledge and no one had inadequate knowledge. Also, the mean post-test scores the knowledge of 36.98 overcoming the mean pre-test score the knowledge of 20.68. Hence it showed the effectiveness of planned teaching programme regarding ABG interpretation. Conclusion: After giving the planned teaching programme on ABG interpretation the knowledge level of staff nurses got increased regarding ABG interpretation, hence it concluded that the planned teaching programme was very effective in enhancing the knowledge of staff nurses regarding ABG interpretation.

INTRODUCTION:

Arterial blood gases (ABG) analysis is a blood test indicating ventilation, gas exchange, and acid-base status in blood taken from the artery. It entails puncturing an artery with a thin needle and a heparinized syringe and

taking a small amount of blood (approximately 1ml). The radial artery at the wrist is the most usual puncture location. but the femoral artery in the groin or other sites are also used. An arterial catheter can also be used to take blood. Arterial blood gas analysis is a critical



investigation for determining clinical oxygenation and acid-base status in critically ill patients. It provides information on ventilation, oxygenation, and acid-base status, the three closely related physiological parameters maintain pH homeostasis in critically ill patients. Nurses work in the most difficult work environment because they are primary caregivers at the bedside and monitor, manage, and support critically ill patients. A typical problem for nurses is determining the association between aberrant blood gas findings and a patient's overall clinical status. To meet this challenge, nurses must understand the mechanism underlying acid-base balance and the common cause of acid-base imbalance. During the clinical experience, the investigator discovered that, despite continuous monitoring with a pulse oximeter, most patients' breathing is monitored by ABG analysis. Although the nurses actively collect ABG samples, their expertise in how to read ABG data is limited. With this in mind, the researcher has justified the necessity to improve nursing knowledge.

BACKGROUND OF THE STUDY

An arterial blood gas (ABG) is an investigation that measures the oxygen tension (PaO_2), carbon dioxide tension (PaCO_2), acidity (pH), oxyhemoglobin saturation (SaO_2), and bicarbonate (HCO_3) concentration in arterial blood. Some blood gas analyzers also measure the methemoglobin, carboxyhemoglobin, and hemoglobin levels. Such information is important when caring for patients with critical illness, respiratory, or metabolic diseases. Arterial blood gas analysis (ABG) is the very common direct vascular puncture diagnostic procedure performed in Intensive care unit. This laboratory tests can help healthcare providers to interpret conditions that affect the respiratory system, circulatory system and metabolic processes, especially in emergency situations. This test only tests a blood sample from an artery in the body. **Manoj Bagul Preeti, (2021)**, conducted a descriptive, evaluative approach (One group pre-test and post-test design) research study on 30 samples who were selected by non-probability convenience sampling technique to assess the Effect of Planned Teaching Programme on Knowledge regarding ABG Analysis among Staff Nurses working in a selected hospital in Mumbai. Structured questionnaire were prepared to assess the knowledge and observation checklist were used to assess the practice among nurses regarding ABG analysis. Pre-test was initiated and planned teaching programme was given and after 5 days post-test was

done. This study had helped to assess the knowledge of staff nurses regarding ABG analysis. The knowledge of staff nurses in post-test was significantly higher than the pre-test score. The finding of the study proved that teaching through planned teaching source is really effective to increase and upgrade the knowledge of staff nurse. This study concluded that regular in-service programme is important for nurses regarding ABG analysis to provide quality care to the patient and to reduce the error in nursing practices

NEED OF THE STUDY

ABG sampling represents the gold standard method for acquiring patient's acid-base status. Arterial blood gas analysis has become an essential skill for all healthcare practitioners. Most of the patients in intensive care unit who are on ventilator support suffer from acid base disorders. Many studies has shown the depicted data that majority of special care units of patient need respiratory assessment and study shown that the nurses posted in various special care units have less knowledge of ABG analysis and its interpretation so it's important and mandatory for the nurses to inculcated the knowledge and the practice of it. As we know that nurses are all around the patient by 24*7 so nurses has to know about sample technique of ABG and its phenomena.

PUROSES

- To improve staff nurses' understanding of ABG analysis.
- To raise the staff nurses' level of proficiency.
- To improve the critically ill patients' quality of care.
- To lower the rate of error in nursing procedures.

PROBLEM STATEMENT

A study to assess the Effect of planned teaching program on the knowledge regarding arterial blood gas interpretation and selected nursing measures among staff nurses of Selected Hospitals of Moradabad, UP

OBJECTIVES

1. To assess the level of knowledge regarding arterial blood gas analysis among staff nurses before planned teaching programme.



2. To assess the level of knowledge regarding arterial blood gas analysis among staff nurses after planned teaching programme.
3. To find out the effectiveness of planned teaching programme on arterial blood gas analysis among staff nurses.
4. To find out association between level of knowledge of ABG interpretation of selected nursing measures among staff nurses with their selected demographic variables.

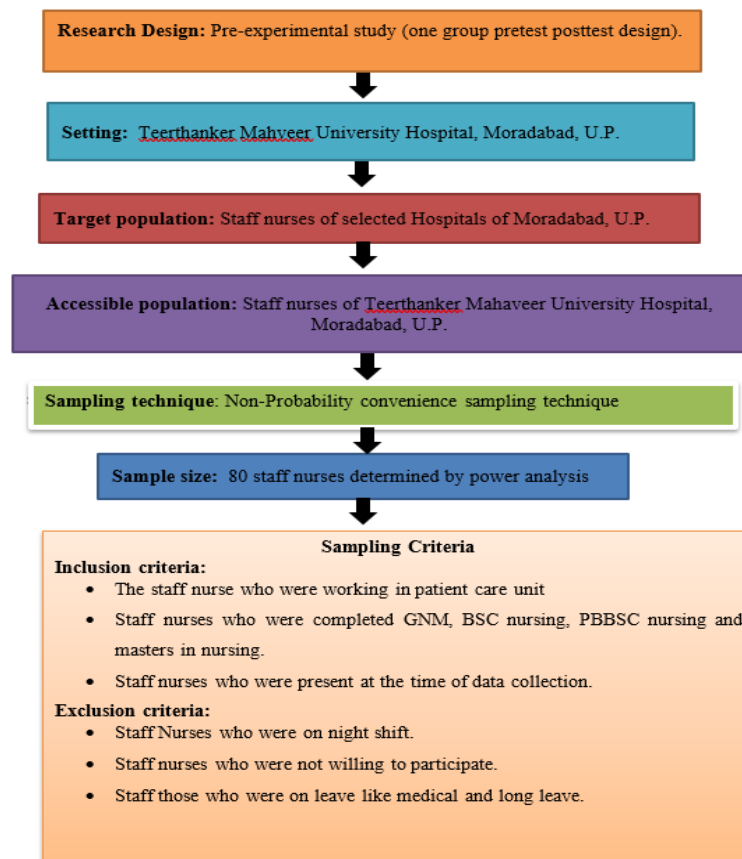
VARIABLES

- **Independent variables:** Planned teaching program regarding ABG sample technique and interpretation.
- **Dependent:** Knowledge of staff nurses regarding ABG sample technique and interpretation.

OPERATIONAL DEFINITION

- **Effectiveness:** In this study effectiveness refers to the result of the planned teaching regarding arterial blood gas on the staff nurses of selected Hospitals of Moradabad U.P.
- **Planned teaching:** In this study planned teaching refers to the content which provides knowledge regarding ABG interpretation to the staff nurses of selected Hospital of Moradabad U.P.
- **Knowledge:** In this study knowledge refers to new things which are gained by the staff nurses through the planned teaching regarding ABG interpretation.
- **Staff nurse:** In this study staff nurses refers to nurses of selected Hospitals of Moradabad U.P. who will be participating in the study.

Figure : - 1 Diagrammatic representative of research design



SECTION A
Frequency and Dispersion of Demographic characteristics of Staff nurses



It dealt with demographic data which consisted of 8 items to collect the sample characteristics, which comprised age of staff nurses, gender, professional

qualification in nursing, monthly income, area of work, total experience, any previous exposure, source of information.

Table 1.1: Frequency and Percentage dispersion of staff nurses according to their Age (in Years) N=80

S.NO.	DEMOGRPHIC VARIABLE	CATEGORIZATION	FREQUENCY (f)	PERCENTAGE (%)
1	AGE	20-25years	16	20%
		26-30 years	50	62.5%
		31-40 years	11	13.8%
		Above 40 years	3	3.8%
	Total		80	100%

The findings in table number 1.1 showed that 62.5% staff nurses were between the age of 26-30 years, 13.8% staff nurses were between the age of 31-40 years, 20%

staff nurses belonged to the age group of 20-25 years, 3.8% staff nurses belonged to the age above 40 years.

Table 1.2: Frequency and Percentage dispersion of Staff nurses according to their Gender N=80

S.NO.	DEMOGRPHIC VARIABLE	CATEGORIZATION	FREQUENCY (f)	PERCENTAGE (%)
2	Gender	Male	35	48.9%
		Female	45	56.3%
		Others	0	0%
	Total		80	100%

The findings in figure 4.2 showed that 56.3% staff nurses were Females and 48.9% staff nurses were Males.

Table 1.3: Frequency and Percentage dispersion of Staff nurses according to the Professional Qualification N=80

S.NO.	DEMOGRPHIC VARIABLE	CATEGORIZATION	FREQUENCY (f)	PERCENTAGE (%)
3	Professional Qualification	GNM	53	66.3%
		B.SC. Nursing	25	31.3%
		PB.BSC. Nursing	2	2.5%



		MSC. Nursing and above	0	0%
	Total		80	100%

The findings in table number 1.3 data highlights that 66.3% staff nurses were GNM, 31.3 % staff nurses were B.Sc. nursing, and 2.5% were PBBSC. Nursing.

Table 1.4: Frequency and Percentage dispersion of staff nurses according to their Monthly Income N=80

S.NO.	DEMOGRPHIC VARIABLE	CATEGORIZATION	FREQUENCY (f)	PERCENTAGE (%)
4	Monthly Income	Rs.10000-20000	38	47.5%
		Rs.20001-30000	42	52.5%
		Rs.30001-40000	0	0%
		Rs. >40000	0	0%
	Total		80	100%

The findings in table number 1.4 highlighted that 52.5% staff nurses earned Rs. 20001-30000 and 47.5 % staff nurses earned 10000-20000.

Table 1.5: Frequency and Percentage dispersion of Staff nurses according to their Total Experience N=80

S.NO.	DEMOGRPHIC VARIABLE	CATEGORIZATION	FREQUENCY (f)	PERCENTAGE (%)
5	Total Experience	1-2 years	6	7.5%
		3-4 years	31	38.8%
		5-6 years	29	36.3%
		>6 years	14	17.5%
	Total		80	100%

The findings in table number 1.5 highlights that 38.8% staff nurses had 3-4 years of experience, 36.3% had 5-6 years of experience, 17.5 % staff nurses had above 6 years of experience and 7.5% had 1-2 years of experience.

Table 1.6: Frequency and Percentage dispersion of Staff nurses according to their Area of Work N=80

S.NO.	DEMOGRPHIC VARIABLE	CATEGORIZATION	FREQUENCY (f)	PERCENTAGE (%)
		Emergency and causality unit	8	10%
		ENT unit and respiratory unit	9	11.3%
		General surgery and medicine	24	30%



6	Area of Work	Ward		
		Pediatric unit	16	20%
		Obstetrics and gynecology unit	14	17.5%
		Psychiatric, Urology and Dermatology ward	9	11.3%
Total		80	100%	

The findings in table number 1.6 highlights that 30% staff nurses worked in General surgery ward, 20% worked in Pediatric unit, 17.5% worked in Obstetrics and

gynecology unit, 11.3% worked in psychiatric, urology and dermatology ward and ENT and respiratory unit and 10% worked in Emergency and causality unit.

Table 1.7: Frequency and Percentage dispersion of Staff nurses according to Previous Exposure to any kind of educational programme regarding ABG interpretation. N=80

S.NO.	DEMOGRPHIC VARIABLE	CATEGORIZATION	FREQUENCY (f)	PERCENTAGE (%)
7	Previous Exposure	Yes	10	12.5%
		No	70	87.5%
Total			80	100%

The findings in table number 1.7 projected that 87.5% staff nurses had no previous exposure and 12.55 staff nurses had previous exposure.

Table 1.8: Frequency and Percentage dispersion of Staff nurses according to their Source of Information N=80

S.NO.	DEMOGRPHIC VARIABLE	CATEGORIZATION	FREQUENCY (f)	PERCENTAGE (%)
8	Source of Information	Books	29	36.30%
		Internet websites	51	63.80%
		Journals	0	0%
		Data bases	0	0%
		Conferences and workshops	0	0%
Total			80	100%

The findings in table number 1.8 highlights that 63.8% staff got information through internet websites and 36.3% got information through the books.

SECTION – B Findings related to pre-test and post-test level of knowledge regarding ABG Interpretation.



Table 2 : Findings related to the pre-test and post-test level of knowledge regarding ABG Interpretation among staff nurses.

S.NO.	Knowledge level	Range of score	Pre-test		Post-test	
			f	%	f	%
1	Inadequate	0-21	44	55 %	0	0%
2	Moderate	22-32	36	45%	9	11.3%
3	Adequate	33-42	0	0%	71	88.8%
	Total		80	100%	80	100%

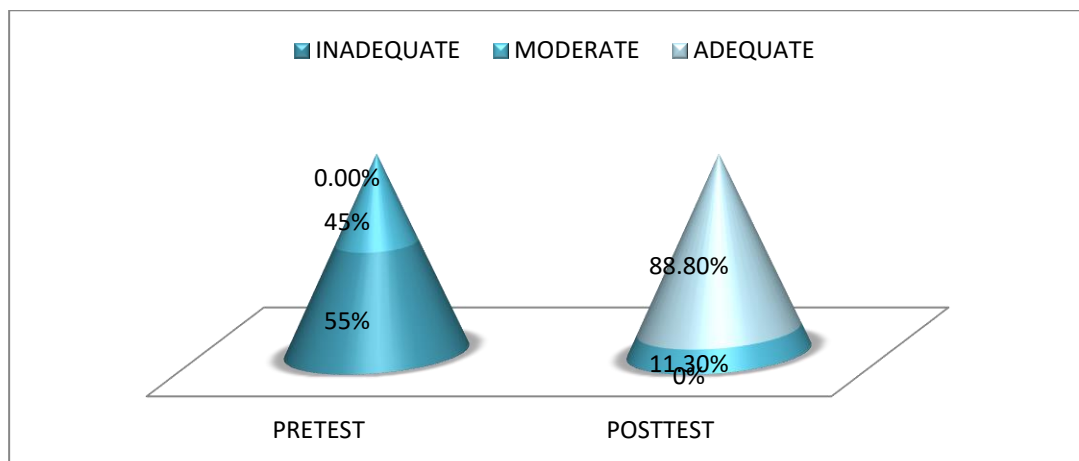


Fig 2. : Cone chart indicates the percentage of participants built on knowledge level of the Staff nurses Pre-test and Post-test. It discloses, participants in a pre-test 55% had inadequate knowledge, 45% had moderate knowledge, no body had adequate knowledge whereas in post-test 88.8% had adequate knowledge, 11.3% had moderate knowledge and no one had inadequate knowled

SECTION - C

Findings related to efficacy of planned teaching Programme regarding ABG Interpretation

Table 3. : Assessment, Mean, SD, Mean difference, Degree of freedom, paired t-test value and P value of pre -test and post-test regarding ABG Interpretation.

S.No	Assessment	Mean (\bar{x})	SD (σ)	Mean Difference	df	Paired t test value	P value
1	Pre-test	20.68	3.63	16.3	79	34.1	0
2	Post-test	36.98	3.67				

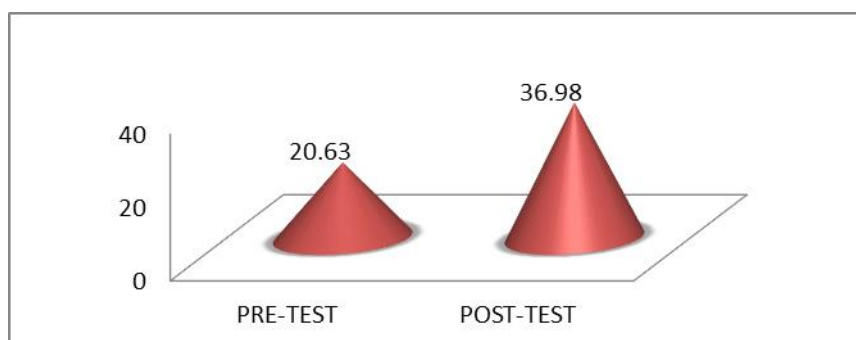


Fig 3.: Cone chart revealed that post-test score (36.98) was more than mean pre-test score of (20.68) with a mean variation of (16.3). Hence it showed that planned teaching Programme was effective among staff nurses. So, the stated hypothesis H_1 - There will be significant difference between the pre-test and post-test knowledge regarding ABG interpretation of selected nursing measures among staff nurses was accepted.

SECTION - D

Findings related to association between the pre-test knowledge regarding ABG interpretation of selected nursing measures among staff nurses.

Table 4. : Association between Pre-test knowledge scores with their selected Demographic Variables. N=80

S.NO.	Socio demographic variables	Inadequate Knowledge (0-21)	Moderate Knowledge (22-32)	Adequate Knowledge (33-42)	Total	Df	Chi-square P value χ^2
1.	Age						
	20-25 Years	11	5	0	16	3	P=0.39 P>0.05 NS
	26-30 Years	27	23	0	50		
	31-40 Years	4	7	0	11		
Above 40 Years	2	1	0	3			
2.	Gender						
	Male	20	15	0	35	1	P=0.73 P>0.05 NS
	Female	24	21	0	45		
Others	0	0	0	0			
3.	Professional Qualification						
	GNM	30	23	0	53	2	P=0.33 P>0.05 NS
	B.Sc. Nursing	12	13	0	25		
	PBBSC. Nursing	2	0	0	2		
M.Sc. Nursing and above	0	0	0	0			



4.	Monthly Income						
	Rs.10000-20000	22	16	0	38	1	P=0.62 P>0.05 NS
	Rs.20001-30000	22	20	0	42		
	Rs.30001-40000	0	0	0	0		
Rs. Above 40000	0	0	0	0			
5.	Total Experience					3	P=0.87 P>0.05 NS
	1-2 Years	3	3	0	6		
	3-4 Years	17	14	0	31		
	5-6 Years	15	14	0	29		
	Above 6 Years	9	5	0	14		
7	Previous Exposure					1	P=0.30 P>0.05 NS
	Yes	7	3	0	10		
	No	37	33	0	70		
8	Source of Information					1	P=0.98 P>0.05 NS
	Books	16	13	0	29		
	Internet websites	28	23	0	51		
	Journals						
	Data bases						
	Conferences and workshops						

Table 4. This table describes the knowledge marks showed chi square values were greater than the table value in all demographic variables. So the questionnaire's pre-test score analysis revealed that there was no association between pre-test scores with their demographic variables. Hence H_2 got rejected

RESULT

The main study findings revealed that the majority of knowledge score of pre-test and post-test. Majority of participants 45 (55%) had inadequate knowledge, 36(45%) had moderate knowledge in pre-test, but after the intervention, there was a significant increase in post-test scores that majority of participants 71 (88.8%) had adequate knowledge, 9 (11.3%) had moderate knowledge and no one had inadequate knowledge. Also, the mean post-test scores the knowledge of 36.98 overcoming the

mean pre-test score the knowledge of 20.68. Hence it showed the effectiveness of planned teaching programme regarding ABG interpretation.

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COMPARISON OF RESULTS WITH OTHER STUDIES

The study revealed that significant difference between post-test knowledge scores and pre-test knowledge scores of staff nurses regarding arterial blood gas analysis. As per the study it was evident that planned teaching programme was an effective strategy to enhance knowledge of staff nurses, a similar study was conducted



by **R. Begum et al** among staff nurses of ICU in Guwahati & Assam the findings of the study were some extent with total sample consisting of 68. The study had shown that in pre-test majority of the respondents 55.88% had inadequate knowledge and 44.12% had moderately adequate knowledge but after administration of STP, majority of the respondents 51.47% had moderately adequate knowledge and 48.53% had adequate knowledge.

SUMMARY

The study revealed that most of the staff nurses had adequate knowledge regarding ABG Analysis. Hence the result of the study proves that the planned teaching program was an effective method for improving the knowledge of staff Nurses.

CONCLUSION

The above study was undertaken to assess the knowledge on ABG Analysis and its interpretation among staff nurses. If they are able to interpret correctly can prevent complications, keep away from errors and help in improving the condition of the patient. So the study motivates staff nurses in improving knowledge on ABG analysis and its interpretation and ultimately improves the patient care and quality of nursing care. It becomes vital for the nurses working in critical care department and other patient care department should have additional knowledge on ABG Analysis and its interpretation in order to save the patients from developing quite lot of complications.

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