



ORIGINAL RESEARCH PAPER

Nursing

"A STUDY TO ASSESS KNOWLEDGE REGARDING ARTERIAL BLOOD GAS (ABG) ANALYSIS AMONG STAFF NURSES WORKING IN CRITICAL CARE AREAS OF A SELECTED HOSPITAL IN MUMBAI"

KEY WORDS: Arterial blood gas, critical care nursing, ABG interpretation, nursing education, clinical decision-making, patient safety

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ABSTRACT

Arterial Blood Gas (ABG) analysis is essential in critical care for assessing a patient's respiratory and metabolic status, yet many nurses lack adequate interpretation skills despite being frequently involved in ABG procedures. This descriptive, non-experimental study evaluated the knowledge, interpretation ability, and practical application of ABG analysis among 50 registered nurses in critical care units at a tertiary care hospital in Mumbai. While 52% of participants demonstrated good theoretical knowledge and 74% had strong practical skills, only 26% showed good interpretive ability, and just 34% felt confident in interpreting ABG results. Key deficiencies were noted in recognizing hypoxemia and interpreting mixed acid-base disorders. These findings highlight a critical gap in clinical interpretation skills, underscoring the need for targeted educational programs, simulation-based training, and ongoing competency assessments to enhance ABG proficiency and ensure timely, accurate clinical decision-making in critical care settings.

INTRODUCTION

Arterial Blood Gas (ABG) analysis plays a pivotal role in critical care by offering insights into a patient's oxygenation, ventilation, and acid-base balance. These parameters guide urgent clinical interventions. Nurses, as frontline responders in intensive care settings, must be able to interpret ABG results with precision. Despite its importance, studies have identified major gaps in ABG interpretation skills among nurses, largely due to limited formal training and continuing education. Misinterpretation can lead to incorrect treatment, compromising patient safety. This study was conducted to assess the knowledge, interpretation skills, and practical understanding of ABG analysis among nurses in a tertiary care hospital in Mumbai.

MATERIAL AND METHODS

A descriptive, non-experimental study design was used. The study was conducted at critical care areas of selected Hospital in Mumbai. The sample included 50 registered nurses working in critical care areas such as ICU, NICU, CCU, and emergency units. Nurses were selected through non-probability convenience sampling. Inclusion criteria required participants to have at least six months of critical care experience and responsibility for interpreting ABG results.

Data were collected using a structured questionnaire comprising:

- Demographic data
- Theoretical knowledge
- Interpretation scenarios
- Clinical application
- Practical skills

Data were analyzed using descriptive statistics (frequency, percentage) and inferential analysis where appropriate.

RESULTS

The result revealed that the majority of participants, 60% were aged 31–35 years and all were females. Majority of samples, 52% had Post Basic B.Sc. Nursing qualifications, while 34% held B.Sc. Nursing degrees. 42% of samples worked in ICUs, and only 24% had specialized critical care training.

The distribution of samples as per theoretical knowledge towards ABG analysis showed that, majority of participants demonstrated good theoretical knowledge (52%) while 14% showed poor knowledge. 90% of participants correctly identified normal pH ranges, but only 54% knew normal PaCO₂ values. The distribution of samples as per interpretation skills towards ABG analysis 66%

demonstrated average interpretive ability, 26% good, and 8% poor. Only 30% identified hypoxemia accurately, and 20% could interpret mixed disorders.

Assessment of Application and Practical Knowledge of BG analysis, 48% of participants demonstrated good clinical application knowledge. 74% had good practical knowledge; 84% knew about the Allen test, and 82% identified the correct sampling technique. Only 34% of participants reported feeling confident in ABG interpretation; 54% were not confident.

Table 1: Presents the frequency and percentage of the correct responses by the critical care nurses regarding the Application and clinical use of ABG.

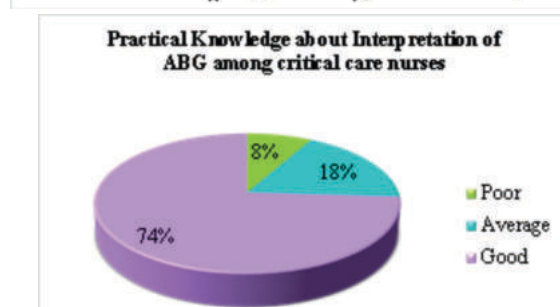
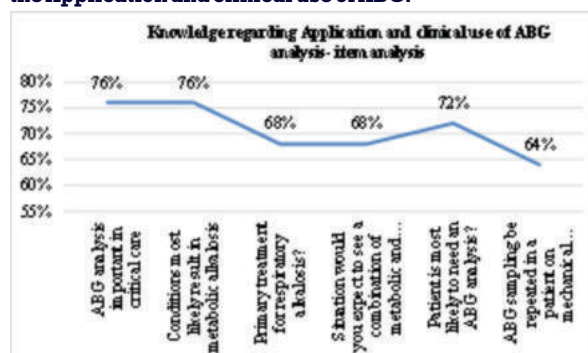


Diagram 1 : Knowledge among critical care nurses regarding Practical Knowledge of ABG

DISCUSSION

The results indicate that while nurses had adequate theoretical and practical knowledge of ABG analysis, their ability to interpret values accurately was limited. Confidence levels were low, even among those frequently involved in ABG procedures. The findings are consistent with Chaitanya et al. (2016), who also reported inadequate interpretation skills among nursing professionals.

The lack of formal ABG-specific training, identified in 58% of the sample, underscores the need for continuing education and institutional support. Misinterpretation of ABG results can lead to poor clinical decisions, highlighting the urgency for interventions to improve proficiency.

CONCLUSION

The study highlights a critical gap in ABG interpretation among nurses working in critical care units. While general knowledge and practical competence were relatively high, interpretation skills and clinical application remain areas of concern. Implementation of structured educational programs, simulation-based learning, and regular competency assessments are recommended to enhance ABG proficiency and promote patient safety.

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