



Original Research Article

“FROM KNOWLEDGE TO PRACTICE: EDUCATIONAL IMPACT ON NURSES’ RESPIRATORY ASSESSMENT SKILLS”

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Abstract: Physical assessment is the systematic collection of both objective and subjective data through health history and a comprehensive examination of body systems. Among these, respiratory assessment is a fundamental skill that every nurse must perform and accurately document, particularly in critical care settings. **Purpose:** The study aimed to evaluate the effectiveness of an educational program on improving the knowledge and practice of nurses regarding respiratory assessment of patients in the intensive care unit (ICU). **Methodology:** A quasi-experimental one-group pre-test and post-test research design was adopted and conducted at a tertiary care hospital in Dehradun, Uttarakhand. A total of 52 nurses were selected using purposive sampling. Data were collected through questionnaire and practice checklist specifically designed to assess respiratory assessment competencies. **Results:** Before the intervention, 58% of nurses exhibited an average level of knowledge, and only 10% demonstrated average practice. Following the educational program, 71% of nurses achieved an average level of knowledge, while 77% showed improvement in practice, reflecting a significant enhancement in both domains. **Conclusion:** The findings clearly indicate that the educational program was effective in enhancing nurses' knowledge and practice related to respiratory assessment. Structured educational interventions can thus play a vital role in improving the quality of nursing care in critical care environments.

Keywords: Knowledge, Practice, Nurses, Respiratory assessment, Skills

INTRODUCTION

The intensive care unit (ICU) is a highly specialized and high-risk clinical setting, accounting for approximately 5–10% of hospital beds worldwide, yet consuming nearly 20–30% of total hospital resources due to the severity and complexity of patient conditions.^{1,2} Critically ill patients frequently experience rapid physiological deterioration, with respiratory dysfunction being one of the leading causes of ICU admission.³ Studies estimate that more than 60% of ICU patients require some form of respiratory support, and up to 40% require invasive mechanical ventilation during their ICU stay.^{4,5} Respiratory failure remains a major contributor to

ICU morbidity and mortality, with reported mortality rates ranging from 30% to 50% depending on severity and underlying conditions.⁶

Nurses play a central role in the continuous monitoring of respiratory status in critically ill patients. In most ICUs, nurses are responsible for bedside surveillance 24 hours a day, performing repeated assessments of respiratory rate, oxygen saturation, work of breathing, and lung auscultation.⁷ Evidence suggests that early recognition of respiratory deterioration by nurses can reduce unplanned intubations by up to 25% and decrease ICU length of stay by approximately 1–2

days.⁸ Despite this, physical assessment—particularly advanced respiratory assessment—remains inconsistently practiced by nurses. Surveys indicate that between 30% and 50% of nurses perceive physical assessment as secondary to task-based care and often rely primarily on monitoring technology rather than systematic clinical examination.^{9,10}

Health assessment is a fundamental nursing competency and a key determinant of patient safety and care quality.¹¹ However, research consistently demonstrates a gap between education and practice. While most nursing curricula include comprehensive training in respiratory assessment, only 11–29% of these skills are routinely applied in clinical settings.^{12,13} Furthermore, studies have shown that nearly 40% of ICU nurses report low confidence in interpreting abnormal breath sounds, and more than 50% identify limited theoretical knowledge as a barrier to effective assessment.¹⁴ This underutilization of assessment skills may delay recognition of respiratory compromise, increasing the risk of adverse events such as hypoxemia, ventilator-associated complications, and cardiac arrest.¹⁵

A strong understanding of respiratory anatomy and physiology is essential for accurate assessment and interpretation of clinical findings. Effective auscultation requires the ability to differentiate between normal and abnormal breath sounds and to relate these findings to underlying pathophysiological changes.¹⁶ Research indicates that nurses with advanced knowledge of respiratory anatomy and physiology demonstrate significantly higher accuracy in identifying abnormal lung sounds and are 1.5–2 times more likely to initiate timely clinical interventions compared to those with limited theoretical knowledge.^{17,18} Enhanced assessment competence has also been associated with reduced rates of respiratory-related adverse events and improved patient outcomes in critical care settings.¹⁹ Given that respiratory complications account for nearly 50% of adverse events reported in ICUs, strengthening nurses' respiratory assessment competencies is a critical priority.²⁰ Despite the high

prevalence of respiratory dysfunction among ICU patients and the demonstrated impact of early detection on patient outcomes, gaps in knowledge, confidence, and clinical application of respiratory assessment skills persist. Therefore, examining nurses' respiratory assessment knowledge, practices, and associated factors is essential to inform targeted educational interventions and support evidence-based nursing practice in the ICU.

METHODS:

The present study utilized a quantitative research approach with a quasi-experimental design, specifically employing a one-group pre-test and post-test framework. The research was conducted in the ICU of a super-specialty postgraduate teaching hospital in Uttarakhand. The sample consisted of 52 nurses selected through purposive sampling based on predefined inclusion criteria.

Data were collected using a structured instrument that included a socio-demographic profile, a self-developed questionnaire containing 32 multiple-choice questions related to respiratory assessment, and a 14-point practice checklist. The validity of the tool was established through expert review by a panel of seven specialists from the fields of Critical Care Medicine and Nursing. The reliability of the tools was tested and confirmed to be satisfactory.

RESULTS

Section A: Frequency and Percentage Distribution of Socio-Demographic Data

The data indicated that majority of participants (88.46%) were within the age range of 21 to 32 years. Most of the participants (69%) were female. Regarding educational qualifications, 69% of the nurses held a General Nursing and Midwifery (GNM) diploma. In terms of professional experience, 46% reported having 1 to 5 years of overall nursing experience, while 56% had 1 to 5 years of ICU-specific experience. Notably, only 17% of the nurses had prior exposure to educational programs specifically aimed at enhancing skills in respiratory assessment.

Section B: Knowledge of Nurses Regarding Respiratory Assessment

Table No.1: Mean knowledge score of participants (n=52)

SNo.	Knowledge	Range	Mean $\pm$ SD	Median	Mean Difference	t-value	P-value
1.	Pre-test	4-28	17.5 $\pm$ 5.5	18	5.4	14.858	<0.001
2.	Post-test	12-30	22.9 $\pm$ 4.1	23			

The findings revealed that the mean post-test knowledge score (22.9 ± 4.1) was significantly higher than the pre-test score (17.5 ± 5.5), with a mean difference of 5.4, which was statistically significant (Table 1).

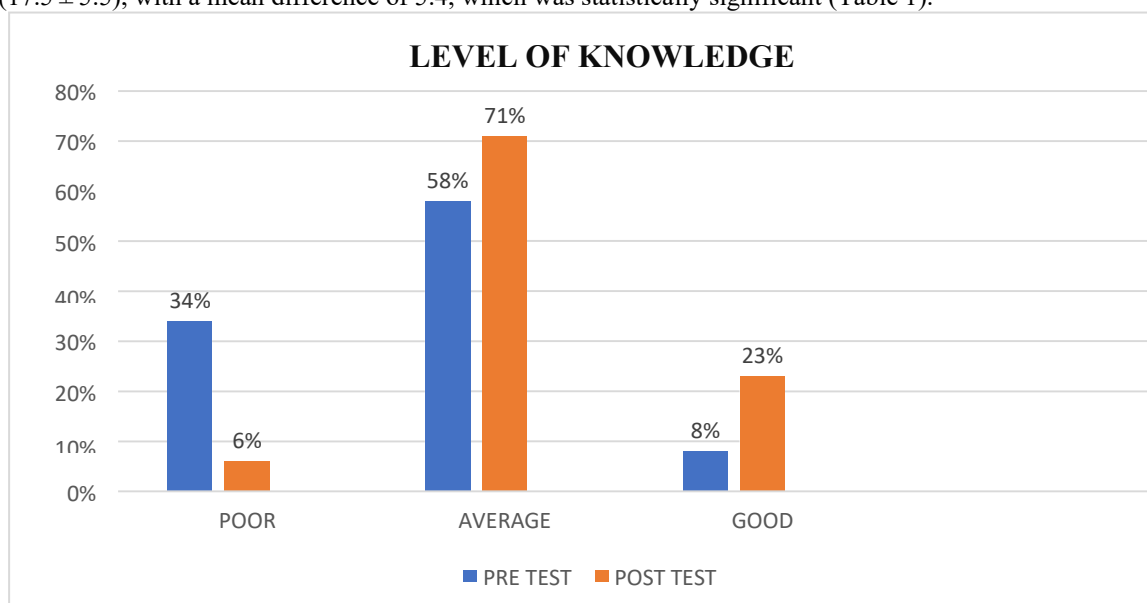


Figure 1: Level of knowledge

Prior to the intervention, only 8% of nurses demonstrated good knowledge, 58% had average knowledge, and 34% showed inadequate knowledge. Following the educational program, 23% of participants achieved good knowledge, 71% retained average knowledge, and only 6% continued to show inadequate knowledge (Figure 1).

Section C: Practice of Nurses Regarding Respiratory Assessment

Table No. 2 Mean pre and post-test practice of nurses (n=52)

SNO.	Practice	Range	Mean $\pm$ SD	Median	Mean Difference	t-value	P-value
1.	Pre-test	2-7	4.6 ± 1.2	7	2.7	18.9	<.001
2.	Post-test	5-7	7.3 ± 1.3	9			

t51-1.671

The average post-test practice score (7.3 ± 1.3) was higher than the pre-test score (4.6 ± 1.2), with a statistically significant mean difference of 2.7 ($t = 18.9$, $p < 0.05$) (Table 2).

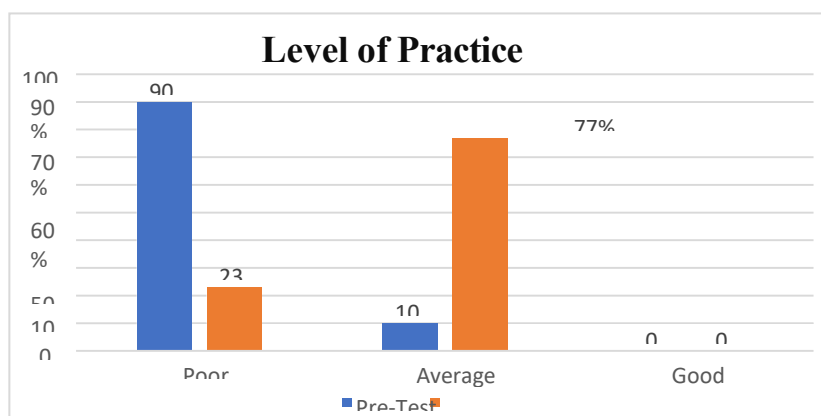


Figure 2: Level of practice

Before the intervention, 90% of the nurses demonstrated inadequate practice, and only 10% showed an average level of proficiency, with none exhibiting good practice. After the intervention, improvements were observed: 23% demonstrated good practice, 71% showed average, and only 6% continued to show poor practice.

Section D: Correlation Between Knowledge and Practice Scores

Table No.3: Correlation between knowledge and practice score

S.NO	Score	"r-value"	P value
1	Knowledge	0.252*	.072
2.	Practice		

Analysis revealed a weak positive correlation ($r = 0.252$) between the knowledge and practice scores of nurses regarding respiratory assessment, indicating a low but statistically measurable association (Table 3).

Section E: Association Between Knowledge, Practice, and Socio-Demographic Variables

No statistically significant associations were found between nurses' knowledge and practice scores and any of the selected socio-demographic variables.

DISCUSSION

The average post-test practice score (7.3 ± 1.3) notably exceeded the pre-test score (4.6 ± 1.2), resulting in a mean difference of 2.7. The calculated t value (18.9) was substantially higher than the tabulated t value ($t_{51} = 1.671$), indicating a statistically significant improvement in nurses' practical skills following the educational intervention.

A study by Latif S. et al²¹, conducted among 36 female ICU nurses aged 24 to 39 in a tertiary hospital in Lahore, revealed that although the nurses possessed foundational knowledge of respiratory anatomy, they lacked the practical skills required for effective respiratory assessment in clinical practice. This finding aligns with the present study, where a weak correlation ($r = 0.252$) was observed between knowledge and practice, underscoring a persistent knowledge-practice gap.

Similarly, research by Mitoma R et al.²² involving 57 visiting nurses emphasized the role of external support in reinforcing motivation, confidence, retention, and application of respiratory assessment knowledge and skills. Their findings highlight the significance of structured support in translating educational gains into practical competencies.

In another relevant study, Mohammed QD and Atiyah HH²³ assessed the impact of an educational intervention on ICU nurses' knowledge of physical therapy for COVID-19 patients. Utilizing a single-group pre-test/post-test design with purposive sampling, the study found that the program significantly enhanced nurses' understanding of relevant clinical procedures—mirroring the present findings regarding the positive effect of focused training interventions.

Strength of study

The study's strengths include its structured

educational intervention, which effectively enhanced both knowledge and practical skills of ICU nurses in respiratory assessment. The use of validated tools and expert-reviewed checklists ensured reliable measurement of outcomes. Additionally, the study provides valuable insights into the knowledge-practice gap in critical care nursing and highlights the importance of targeted training programs to improve patient care in high-risk ICU settings.

Limitations of the Study

The study was limited by its one-group pre-test and post-test design without a control group, which restricts causal interpretation of the findings. The small sample size and use of purposive sampling from a single hospital limit the generalizability of the results. Additionally, the assessment focused on short-term outcomes without follow-up to evaluate long-term retention of knowledge and skills, and patient-related outcomes were not measured to determine the direct clinical impact of the intervention.

Recommendation

It is recommended to implement regular, structured educational programs on respiratory assessment for ICU nurses, include follow-up sessions to reinforce skill retention, and expand research to multiple centers with larger samples to enhance generalizability and evaluate the impact on patient outcomes.

CONCLUSION

The findings of the current study affirm that educational programs targeting respiratory assessment significantly improve both the knowledge and practical skills of ICU nurses. Such improvements are critical in facilitating more accurate and timely respiratory evaluations, ultimately contributing to better patient care. The results underscore the importance of continuous professional development and targeted training to

ensure nurses are equipped with up-to-date competencies in critical care settings.

Conflict of Interest: The authors declare no conflict of interest.

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Ethical Approval: Ethical approval was obtained from Ethics Committee, Swami Rama Himalayan University. (SRHU/HIMS/ETHICS/2023/43(B))

Informed Consent: Informed Written consent was obtained from all the participants.

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