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Original Article

Effect of Nursing Education on Nurses Regarding Quality Care of Patient and Their Satisfaction in Pulmonology Department at Private Hospital

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ABSTRACT

Background: Nursing education is an important strategy for improving professional knowledge, standardizing care practices, and strengthening quality patient care in specialized hospital departments. Pulmonology nurses require focused competencies in respiratory assessment, infection prevention, communication, patient comfort, and safety-oriented care. Objective: To evaluate the effect of a structured nursing education intervention on nurses' knowledge regarding quality patient care in the pulmonology department of a private hospital. Methods: A single-group quasi-experimental pre–post intervention study was conducted among 30 nurses working in the pulmonology department from February 12 to June 30, 2024. Baseline data were collected using a structured knowledge questionnaire and practice checklist. A structured educational intervention focusing on standardized quality-care practices was delivered, and post-intervention assessment was conducted after six weeks. Demographic variables were summarized using frequencies and percentages, and pre- and post-intervention knowledge scores were compared using a paired-samples t-test. Results: All participants were female; 56.7% were aged 20–22 years, 43.3% were aged 23–25 years, 43.3% held diploma-level qualification, and 56.7% held degree-level qualification. The mean knowledge score increased from 8.57 before the intervention to 18.33 after the intervention, with a mean improvement of 9.76 points and $p<0.001$. Conclusion: The structured nursing education intervention was associated with significantly improved nurses' knowledge regarding quality patient care in the pulmonology department. Further controlled studies with validated practice and patient-satisfaction outcomes are recommended. Keywords: Nursing Education; Quality Patient Care; Knowledge; Pulmonology Department; Quasi-Experimental Study; Patient Satisfaction.

INTRODUCTION

Quality nursing care is a central determinant of patient safety, clinical recovery, and satisfaction with hospital services, particularly in specialized units where patients require continuous monitoring, technically competent care, effective communication, and timely response to changing clinical conditions. Pulmonology departments manage patients with acute and chronic respiratory problems who often require oxygen therapy, airway clearance support, medication administration, infection-prevention measures, respiratory assessment, and education regarding disease self-management. In such settings, nurses are not only responsible for routine bedside care but also play a direct role in recognizing deterioration, preventing complications, maintaining therapeutic communication, and supporting patient comfort. Evidence from nursing and hospital-care research consistently shows that nursing work environments, staffing adequacy, professional competency, and patient-centered nursing behaviors are associated with patient safety, missed care, and patient satisfaction outcomes (1–4).

Nursing education is therefore an important modified strategy for improving the quality of care delivered in clinical units. Formal and continuing education strengthens nurses' clinical reasoning, evidence-based decision-making, procedural accuracy, communication skills, and confidence in managing patient needs. In specialized hospital departments, educational interventions are particularly valuable because nurses must apply general nursing principles within the context of disease-specific care requirements. Pulmonology care requires knowledge of respiratory assessment, infection control, medication safety, oxygen administration, patient positioning, breathing-related comfort measures, and patient education. When nurses have insufficient or inconsistent knowledge in these areas, the risk of missed care, communication gaps, and reduced patient satisfaction may increase. Conversely, structured educational programs can address knowledge deficits and standardize care practices, especially among young or early-career nurses working in high-demand clinical environments (1,3,5).

Patient satisfaction is closely linked with the quality of nursing care because patients interact with nurses more frequently than with most other healthcare professionals during hospitalization. Patients' perceptions of care are influenced by nurses' responsiveness, empathy, communication, respect, technical competence, and ability to provide understandable information about treatment and recovery. Previous research has highlighted that patients' experiences of nursing care are shaped not only by clinical outcomes but also by interpersonal and organizational aspects of care, including communication, continuity, and professional conduct (4–6). Therefore, improving nurses' knowledge and practice through targeted education may contribute indirectly to better patient experiences, although patient satisfaction should be measured separately if it is intended as an outcome.

Despite the recognized importance of nursing education, gaps remain in how structured teaching interventions are implemented and evaluated in specialized units such as pulmonology departments in private hospital settings. Many healthcare institutions expect nurses to deliver high-quality, patient-centered care, but routine educational reinforcement, assessment of knowledge gaps, and post-training evaluation may be limited. In the present study, the research problem was the need to determine whether a focused nursing education program could improve nurses' knowledge and practice related to quality patient care in a pulmonology department. The study was guided by a pre–post intervention framework in which nurses' baseline knowledge and practice were assessed, a structured educational intervention was delivered, and post-intervention assessment was conducted after six weeks. The objective of this study was to evaluate the effect of a structured nursing education intervention on nurses' knowledge and practice regarding quality patient care in the pulmonology department of a private hospital. The study hypothesized that nurses would demonstrate higher post-intervention knowledge scores compared with their pre-intervention scores after receiving the educational intervention.

MATERIALS AND METHODS

A single-group quasi-experimental pre–post intervention study was conducted to evaluate the effect of a structured nursing education program on nurses' knowledge and practice regarding quality patient care in the pulmonology department of a private hospital. The study was carried out from February 12, 2024, to June 30, 2024. The pre–post design was selected because the purpose of the study was to assess change in nurses' knowledge and practice after exposure to an educational intervention within the same clinical group. This design allowed each participant to serve as her own baseline comparator, which was appropriate for evaluating short-term educational improvement in a real-world departmental setting.

The study population consisted of nurses working in the pulmonology department and directly involved in patient care. A total of 30 nurses were included. The sample size was determined using Slovin's formula based on the accessible nursing population in the department. Nurses were eligible if they were directly involved in patient care, had regular communication with patients, possessed working familiarity with pulmonology-department care routines, and were willing to participate in the study. Head nurses and student nurses were excluded because their responsibilities, supervision roles, or

training status could differ from those of staff nurses providing routine bedside care. Participants were selected frm the eligible nursing staff of the pulmonology department during the study period.

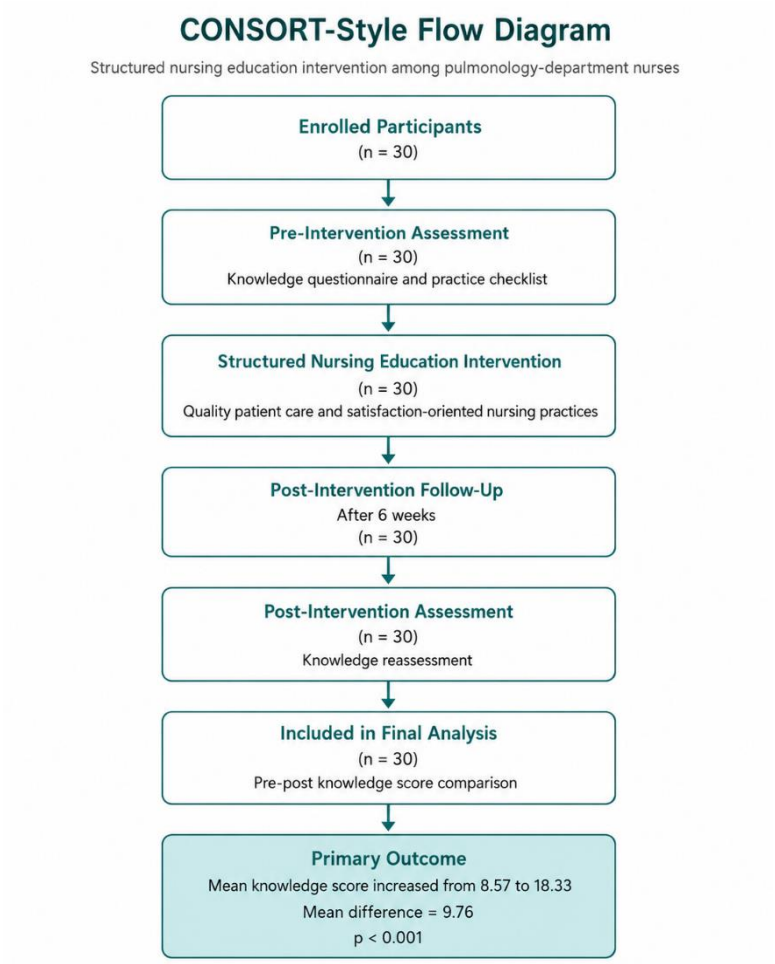

Figure 1 CONSORT Flowchart

Baseline data were collected before the educational intervention using a structured knowledge questionnaire and a practice checklist focused on quality patient care in the pulmonology setting. The knowledge assessment evaluated nurses' understanding of key care principles relevant to hospitalized pulmonology patients, including patient assessment, communication, infection-control practices, care standardization, patient comfort, safety, and satisfaction-oriented nursing behaviors. The practice checklist was used to assess care-related behaviors relevant to quality nursing practice in the department. Demographic information, including age, gender, and educational qualification, was also recorded to describe the participant profile.

After completion of baseline assessment, a structured nursing education intervention was delivered to the participating nurses. The teaching sessions focused on standardized guidelines for quality patient care, patient-centered nursing behaviors, communication, safe clinical practice, and satisfaction-oriented care in the pulmonology department. The intervention was designed to address baseline knowledge gaps and reinforce consistent nursing practices relevant to the care of patients with respiratory conditions. The same group of nurses was reassessed six weeks after the intervention to determine post-education changes in knowledge and practice.

The primary outcome of the study was change in nurses' knowledge score from pre-intervention to post-intervention assessment. Practice-related performance was considered a supportive care-process outcome where checklist data were available. Patient satisfaction was treated as a care-quality concept informing the educational content rather than as an independently analyzed outcome, unless separately collected patient-level satisfaction data were available. The main independent variable was exposure to

the nursing education intervention, and the dependent variables were post-intervention knowledge and practice scores compared with baseline values.

To reduce measurement bias, the same assessment approach was applied before and after the intervention, and all participants were assessed using the same questionnaire and checklist format. Restricting the study to nurses from the pulmonology department improved contextual consistency, although the single-department design limited generalizability. Potential confounding related to differences in baseline training and educational qualification was addressed descriptively by reporting participants' demographic and educational characteristics.

Data were entered and analyzed using statistical software. Categorical variables, including age group, gender, and educational qualification, were summarized as frequencies and percentages. Continuous knowledge scores were summarized as means. Pre- and post-intervention knowledge scores were compared using a paired-samples t-test because the same participants were assessed at two time points. Statistical significance was evaluated at a 5% level, and p-values less than 0.05 were considered statistically significant. Results were reported using exact values where available, with $p<0.001$ used instead of $p=0.000$ for highly significant findings. Data were checked for completeness and consistency before analysis to ensure accuracy of pre–post comparison.

RESULTS

A total of 30 nurses from the pulmonology department were included in the study. All participants completed the pre-intervention and post-intervention assessments and were included in the final analysis.

Table 1. Baseline Demographic Characteristics of Participating Nurses

Variable	Category	n	%
Age, years	20–22	17	56.7
	23–25	13	43.3
Gender	Female	30	100.0
Educational qualification	Diploma	13	43.3
	Degree	17	56.7

The study sample consisted entirely of female nurses. Most participants were aged 20–22 years, representing 17 of 30 nurses, while 13 nurses were aged 23–25 years. Regarding educational qualification, 17 nurses held a degree-level qualification and 13 held a diploma-level qualification. This indicates that the study population was relatively young and predominantly degree-qualified, which is important when interpreting the effect of a structured educational intervention on knowledge improvement.

Table 2. Pre- and Post-Intervention Knowledge Scores Among Nurses

Outcome	Assessment Time Point	Mean	n	Mean Difference	p-value
Knowledge score	Pre-intervention	8.57	30	9.76	<0.001
	Post-intervention	18.33	30		

The mean knowledge score increased from 8.57 before the educational intervention to 18.33 after the intervention, giving a mean improvement of 9.76 points. The paired pre–post comparison showed a statistically significant difference with $p<0.001$, indicating that nurses demonstrated higher knowledge scores after receiving the structured nursing education intervention. Because the study used a single-group pre–post design, the findings support an association between the educational intervention and improved knowledge scores, but they should not be interpreted as definitive causal evidence in the absence of a control group.

Reviewer-Style Statistical Note: The manuscript provides the pre- and post-intervention means and p-value but does not report standard deviations, standard errors, confidence intervals, t-statistic, degrees of freedom, or effect size. These statistics should be added from the original dataset or SPSS paired-

samples output to strengthen the statistical reporting. The abstract and discussion also report a different set of pre- and post-education means, which must be corrected so that all sections report the same knowledge-score values.

Table 3. Availability of Reported Study Outcomes

Outcome Domain	Reported in Manuscript	Numerical Data Available	Suitable for Final Statistical Reporting
Demographic characteristics	Yes	Yes	Yes
Pre-intervention knowledge score	Yes	Yes	Yes
Post-intervention knowledge score	Yes	Yes	Yes
Practice checklist score	Yes	No	No
Patient satisfaction score	No	No	No

The available data support descriptive reporting of demographic characteristics and inferential comparison of pre- and post-intervention knowledge scores. Although the manuscript mentions practice assessment and patient satisfaction in the objective and methods, no numerical practice-checklist scores or patient-satisfaction scores are presented. Therefore, the current results should be limited to nurses' demographic characteristics and improvement in knowledge scores. Claims regarding improved practice or patient satisfaction require additional numerical evidence before they can be included in the final results.

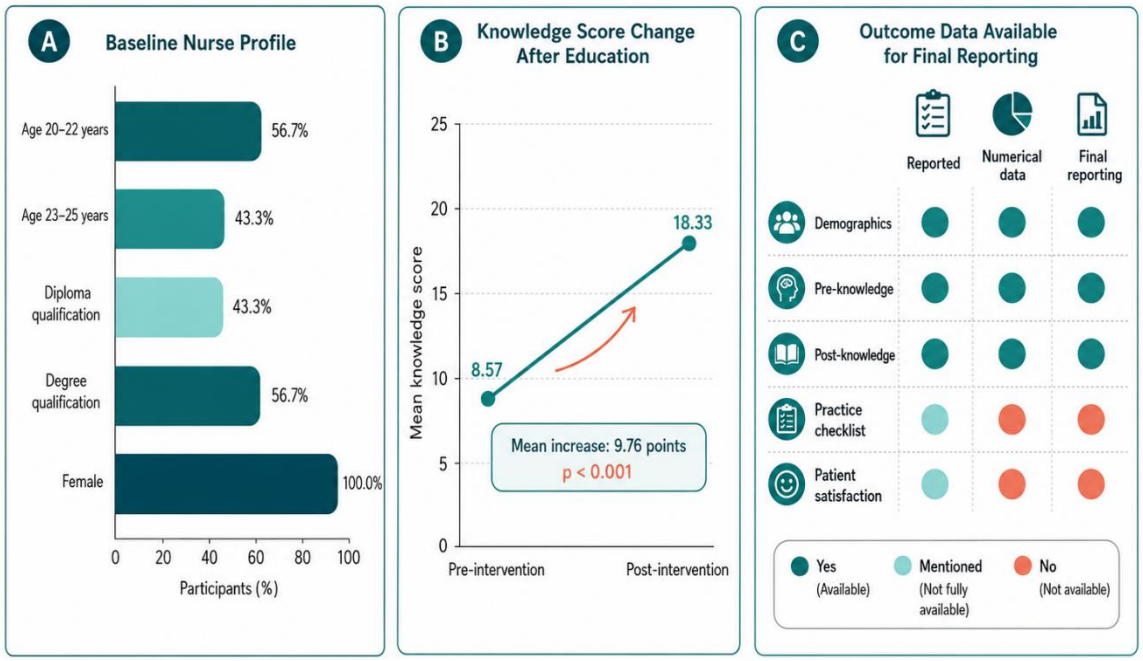

Figure 1. Structured Nursing Education and Nurse Knowledge in a Pulmonology Department. The panelled figure summarizes the available aggregate findings from the quasi-experimental pre–post educational intervention. Panel A shows that the sample consisted of 30 female nurses, with 56.7% aged 20–22 years, 43.3% aged 23–25 years, 43.3% holding diploma-level qualification, and 56.7% holding degree-level qualification. Panel B demonstrates an increase in mean knowledge score from 8.57 before the intervention to 18.33 after the intervention, corresponding to a 9.76-point improvement with p<0.001. Panel C highlights the reporting completeness of available outcomes, showing that demographic data and pre/post knowledge scores were numerically available for final reporting, whereas practice-checklist and patient-satisfaction outcomes were mentioned but not supported by numerical data in the supplied manuscript.

DISCUSSION

The present quasi-experimental pre–post study evaluated the effect of a structured nursing education intervention on nurses' knowledge regarding quality patient care in the pulmonology department of a private hospital. The findings showed a clear improvement in mean knowledge score after the intervention, increasing from 8.57 at baseline to 18.33 after six weeks, with a mean gain of 9.76 points and a statistically significant paired comparison. This improvement suggests that targeted educational sessions may strengthen nurses' understanding of quality patient care principles in a specialized

respiratory-care setting. Because the study used a single-group pre–post design without a parallel control group, the findings should be interpreted as an intervention-associated improvement rather than definitive evidence of causality.

The observed improvement is consistent with the broader nursing literature indicating that structured education, professional development, and supportive work environments contribute to improved nursing competence and care processes. Evidence from nurse staffing and clinical judgment research has emphasized that nurses' professional knowledge, decision-making, and work-system support are central to maintaining safe and responsive patient care (7). Similarly, studies on evidence-based nursing practice and handover improvement have shown that structured educational and practice-standardization efforts can improve clinical consistency and strengthen care delivery in acute hospital settings (8). In the context of pulmonology, these findings are clinically relevant because patients with respiratory conditions often require timely assessment, infection-control vigilance, medication safety, oxygen-related monitoring, and patient-centered communication.

The demographic profile of participants provides additional context for interpreting the findings. Most nurses were young, with 56.7% aged 20–22 years and 43.3% aged 23–25 years, and all participants were female. More than half of the sample held degree-level qualification, while the remainder had diploma-level qualification. A relatively young nursing workforce may benefit strongly from structured educational reinforcement because early-career nurses are still consolidating clinical judgment, communication skills, and specialty-specific confidence. Previous research has linked educational preparation and professional development with nursing care quality, patient ratings, and safety outcomes, supporting the importance of continuous competency-building programs in hospital nursing services (9,10).

Although the study objective referred to quality care and patient satisfaction, the available numerical results primarily support conclusions about nurses' knowledge improvement. The manuscript does not provide separate numerical findings for patient satisfaction or practice-checklist scores. Therefore, it would be inappropriate to conclude that the educational intervention directly improved patient satisfaction or observed practice unless those data are added and analyzed. However, the intervention remains relevant to patient-centered care because nursing knowledge, communication, responsiveness, and care coordination are recognized contributors to patient experience and satisfaction. Studies examining nursing work environments and patient outcomes have shown that improved nursing conditions and reduced missed care are associated with better patient safety and satisfaction indicators (11,12). The present study may therefore be viewed as a preliminary educational intervention that strengthens a process-level determinant of care quality, but not as direct evidence of patient-level improvement.

The findings also highlight the practical value of unit-based nursing education in specialized hospital departments. Pulmonology nurses require not only general nursing knowledge but also focused understanding of respiratory assessment, safe oxygen support, infection prevention, patient education, and early recognition of clinical deterioration. A structured education program can help standardize these competencies, reduce variability in care, and support a more consistent approach to patient-centered nursing practice. In private hospital settings, where patient expectations regarding communication, comfort, responsiveness, and professional conduct may be high, regular educational interventions may help nurses align routine bedside care with institutional quality standards.

Several limitations should be considered when interpreting these findings. First, the study used a single-group pre–post design, so the improvement in knowledge scores may have been influenced by repeated testing, increased familiarity with the questionnaire, informal learning during the study period, or other unmeasured factors. Second, the sample size was small and restricted to 30 nurses from one pulmonology department, which limits generalizability to other departments, hospitals, or nursing populations. Third, all participants were female and relatively young, so the findings may not represent

more diverse nursing teams. Fourth, the manuscript does not report standard deviations, confidence intervals, effect size, t-statistic, or degrees of freedom, which limits interpretation of the magnitude and precision of the intervention effect. Fifth, although practice and patient satisfaction were mentioned, numerical data for these outcomes were not reported, preventing direct evaluation of whether knowledge improvement translated into better observed practice or patient experience.

Future studies should use a stronger design, preferably with a comparison group, larger sample size, and multiple hospital settings. Educational outcomes should be assessed using validated knowledge tools, structured practice checklists, and independently measured patient-satisfaction instruments. Reporting should include mean differences, standard deviations, confidence intervals, effect sizes, and complete paired-test statistics. Longer follow-up would also help determine whether knowledge gains are retained and whether they lead to measurable improvements in nursing practice and patient-reported care experiences. Despite these limitations, the present study provides useful preliminary evidence that structured nursing education is associated with improved knowledge among nurses working in a pulmonology department.

CONCLUSION

The structured nursing education intervention was associated with a significant improvement in nurses' knowledge regarding quality patient care in the pulmonology department, with the mean knowledge score increasing from 8.57 before the intervention to 18.33 after six weeks. These findings support the value of focused, unit-based educational programs for strengthening nurses' understanding of quality care principles in specialized clinical settings. However, because the study used a single-group pre–post design and did not provide separate numerical results for practice performance or patient satisfaction, the conclusion should be limited to improved knowledge rather than direct improvement in patient satisfaction or clinical outcomes. Regular nursing education, supported by validated assessment tools and stronger follow-up evaluation, may contribute to improved care processes in pulmonology nursing practice.

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