

BRIDGING THE GAP: ENHANCING NURSING STUDENTS' KNOWLEDGE AND PRACTICE IN OXYGEN ADMINISTRATION

Shilpa Satralkar¹, Yogesh Bhosale², Basvant Dhudum³, Nikita Londhe⁴, Mahima Sarode⁵, Sandeep Sonawale⁶, Vishal Pardeshi⁷.

¹Assistant Professor, Department of Medical Surgical Nursing, Bharati Vidyapeeth (Deemed to be University) College Nursing Sangli Maharashtra, India.

²Clinical Instructor, Department of Medical Surgical Nursing, Bharati Vidyapeeth (Deemed to be University) College Nursing Sangli Maharashtra, India.

³Associate Professor, Department of Medical Surgical Nursing, Bharati Vidyapeeth (Deemed to be University) College Nursing Sangli Maharashtra, India.

⁴Clinical Instructor⁴, Department of Medical Surgical Nursing, Bharati Vidyapeeth (Deemed to be University) College Nursing Sangli Maharashtra, India.

*Corresponding authors: Shilpa Satralkar, <https://orcid.org/0000-0003-4828-8405>

ABSTRACT

Background: Oxygen administration is an essential nursing intervention for patients with hypoxemia, respiratory distress, cardiac conditions, trauma, postoperative complications and emergencies. Safe oxygen therapy requires both theoretical knowledge and correct psychomotor performance. Skill-station teaching provides demonstration, supervised practice, return demonstration and feedback in a controlled setting.

Objective: To assess the knowledge and practice of nursing students regarding oxygen administration and to determine the effectiveness of skill-station training using pre-test and post-test assessments.

Methods: A quantitative evaluative approach with a one-group pre-test–post-test design was used among 100 nursing students from selected nursing colleges in the Sangli–Miraj–Kupwad Corporation area. Data were collected using demographic variables, a structured knowledge questionnaire and an observational checklist for oxygen administration. Content validity was established through expert review, and reliability was reported as $r=0.84$ using Karl Pearson's correlation coefficient. Descriptive statistics and paired t-test were used.

Results: Participants were aged 17–20 years; 54% were male and 46% female, and all were first year B.Sc. Nursing students. Mean knowledge increased from 9.58(SD1.54) in the pretest to 13.43(SD1.34) in the post-test, with paired $t = 18.86$ and $p < 0.001$. Mean practice increased from 15.64 (SD 1.62) to 19.24 (SD 1.71), with paired $t = 21.56$ and $p < 0.001$.

Conclusion: Skill-station training was associated with statistically significant improvement in both knowledge and practice regarding oxygen administration.

KEYWORDS: oxygen administration; skill station; nursing students; knowledge; practice; nursing education

INTRODUCTION

Oxygen is essential for normal cellular metabolism and is routinely administered when patients cannot maintain adequate oxygenation. Oxygen therapy is treated as a medication and therefore requires appropriate assessment, administration, monitoring and safety precautions. Nurses frequently care for patients who require supplemental oxygen and must understand respiratory and cardiovascular physiology as well as the principles of oxygen delivery. The source thesis emphasizes that errors in flow-rate adjustment, device selection, oxygen-saturation monitoring and infection-control measures can compromise patient safety.

Skill stations are described in the thesis as structured teaching-learning environments in which students use equipment or mannequins, observe demonstrations, perform return demonstrations and receive supervision and feedback. Repeated practice can help bridge the gap between theoretical knowledge and clinical performance. The study therefore examined whether skill-station training could improve nursing students' knowledge and practice regarding oxygen administration.

Aim and Objectives To assess the knowledge and practice regarding oxygen administration.

To assess pre-test and post-test scores before and after skill-station training. To compare pre-test and post-test knowledge scores regarding oxygen administration. To compare pre-test and post-test scores regarding oxygen administration.

Methodology Research approach and design: Quantitative evaluative approach using a one group pre-test–post-test design

Population and sample: Nursing students; sample size 100. Inclusion criteria included first-year B.Sc. Nursing students.

Sampling: non-probability convenience sampling. **Variables:** Independent variable—skill station; dependent

variables knowledge and practice. **Tools:** Section I demographic variables; Section II structured knowledge questionnaire; Section III observational checklist for oxygen administration. Content validity was established through expert review. Reliability was reported as $r = 0.84$ using Karl Pearson's correlation coefficient

Data analysis: Frequency, percentage, mean and standard deviation were used for descriptive analysis. Paired t-test was used to compare pre-test and post-test scores.

RESULTS

Knowledge scores

Knowledge level	Score range	Pre-test n (%)	Post-test n (%)
Poor	0–5	0 (0%)	0 (0%)
Average	6–10	72 (72%)	0 (0%)
Good	11–15	28 (28%)	93 (93%)
Excellent	16–20	0 (0%)	7 (7%)
Mean (SD)		9.58 (1.54)	13.43 (1.34)

The mean knowledge score increased from 9.58 (SD 1.54) before the intervention to 13.43 (SD 1.34) after the intervention. The paired t-test was 18.86 with $p < 0.001$, indicating a statistically significant pre-test/post-test difference.

Practice scores

Practice level	Score range	Pre-test n (%)	Post-test n (%)
Poor	0–6	0 (0%)	0 (0%)
Average	7–12	18 (18%)	4 (4%)
Good	13–18	77 (77%)	75 (75%)
Excellent	19–24	5 (5%)	21 (21%)
Mean (SD)		15.64 (1.62)	19.24 (1.71)

The mean practice score increased from 15.64 (SD 1.62) before the intervention to 19.24 (SD 1.71) after the intervention. The paired t-test was 21.56 with $p < 0.001$, indicating a statistically significant pre-test/post-test difference.

DISCUSSION

The study findings demonstrate improvement in both knowledge and practical performance following skill-station training. Before the intervention, most students had average knowledge (72%), whereas after training 93% had good knowledge and 7% had excellent knowledge. Practice scores also shifted toward higher performance, with excellent practice increasing from 5% to 21%. The statistically significant paired t-test results support the study's conclusion that the intervention was effective within the study sample. The findings are consistent with the literature summarized in the source thesis. Earlier educational intervention on oxygen therapy reported improved knowledge and performance after structured training. The thesis also summarizes evidence that simulation-based education can improve nursing skill performance. Together, these findings support the use of supervised, repeated, skill-focused learning to complement theoretical instruction. **Conclusion** The study concludes that skill-station training significantly improved nursing students' knowledge and practice regarding oxygen administration. The intervention increased mean knowledge from 9.58 to 13.43 and mean practice from 15.64 to 19.24, with both comparisons statistically significant at $p < 0.001$. Within the limits of the study design and sample, skill station teaching appears to be an effective educational strategy for strengthening competence in oxygen administration.

Implications Nursing education Skill based teaching and supervised practical training should complement theoretical instruction. Nursing practice: Better knowledge and performance may support safer oxygen administration and reduce procedural errors. Nursing administration: Regular training programs and adequate skill laboratory facilities can support competency development. Nursing research: Larger samples and comparative studies can evaluate skill stations against other teaching methods

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