

Effectiveness of Educational Package on Mechanical Ventilation among Staff Nurses Working in Intensive Care Units

Manjeet Kaur¹, Dr. Chandu Bhardwaj²

¹Ph.D. Scholar, Desh Bhagat University, Mandi Gobindgarh, Punjab, India

²Professor, Desh Bhagat University, Mandi Gobindgarh, Punjab, India

ABSTRACT

This study evaluates the effectiveness of an educational package on mechanical ventilation among staff nurses in Intensive Care Units (ICUs). A quasi-experimental design with one control group and one experimental group, each comprising nine participants, was employed. The educational package was delivered over three days, and assessments using knowledge and skill questionnaires were conducted after seven days. Results indicate a significant improvement in knowledge and skills in the experimental group compared to the control group. The findings highlight the potential benefits of continuous education in enhancing nursing competencies in critical care settings.

KEYWORDS: Mechanical ventilation, Intensive Care Units (ICUs), Educational package, Nursing competencies

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INTRODUCTION

Mechanical ventilation is a lifesaving intervention commonly used in Intensive Care Units (ICUs) to support patients with respiratory failure or other conditions affecting normal breathing. Given the complexity of this procedure, it requires a high level of proficiency and technical expertise from ICU staff, particularly nurses who are often on the frontlines of patient care. Their ability to manage mechanical ventilation effectively can significantly impact patient outcomes, reducing the risks of complications such as ventilator-associated pneumonia and other respiratory dysfunctions.

Despite continuous advancements in mechanical ventilation technologies and the development of standardized protocols, gaps in knowledge and practical application among staff nurses remain a concern. These gaps can lead to suboptimal patient care and increased mortality, especially in fast-paced ICU environments where quick and accurate decision-making is crucial. Additionally, variations in the level of education, training, and experience

among nursing staff can further exacerbate these discrepancies in care.

In light of these challenges, ongoing education and training tailored to the specific needs of ICU nurses are essential. This study aims to assess the effectiveness of a targeted educational package designed to enhance the knowledge, skills, and overall competencies of staff nurses in managing mechanical ventilation. By addressing current gaps and improving proficiency, the study hopes to contribute to better patient outcomes and promote a higher standard of care in ICUs.

Methods

A quasi-experimental design was adopted, involving one experimental group and one control group, each consisting of nine staff nurses. The study was conducted in the ICU of a tertiary care hospital. Eighteen staff nurses were randomly assigned to the experimental (n=9) and control (n=9) groups. The educational package comprised lectures, hands-on

demonstrations, and interactive sessions conducted over three consecutive days. The tools used were demographical data including factual personal information which could influence the results of the data, structured questionnaires covering theoretical aspects of mechanical ventilation and a skill questionnaire consisting of an observational checklist assessing practical competencies. Pre-intervention assessments were conducted for both groups. The educational package was then administered to the experimental group. Post-intervention assessments were performed after seven days for both groups. Data were analysed using SPSS software. Paired t-tests were used to compare pre-and post-intervention scores within groups, and independent t-tests were used to compare the scores between groups.

Results

Both groups were comparable in age, gender, and years of experience. The experimental group showed a significant increase in knowledge scores from a mean of 45% pre-intervention to 85% post-intervention ($p < 0.001$). The control group showed no significant change. The experimental group demonstrated a significant improvement in skill scores from a mean of 50% pre-intervention to 90% post-intervention ($p < 0.001$). The control group showed no significant change. Post-intervention knowledge and skill scores were significantly higher in the experimental group compared to the control group ($p < 0.001$).

Discussion

The results of this study demonstrate that the educational package significantly improved both knowledge and skills related to mechanical ventilation among ICU nurses in the experimental group. These findings suggest that targeted educational interventions can effectively bridge knowledge gaps and enhance practical competencies in critical care settings.

Comparison with Other Studies

1. **Blackwood et al. (2010):** This study found that ICU nurses who underwent a structured educational program on mechanical ventilation showed substantial improvements in their knowledge base. Similar to our findings, Blackwood et al. reported a significant increase in knowledge scores post-intervention. This reinforces the importance of continuous education in maintaining and enhancing the proficiency of critical care nurses.
2. **Hsu and Hsieh (2009):** In their study on factors affecting ICU nurses' knowledge and skills, Hsu and Hsieh found that targeted training sessions significantly improved practical skills. Our results

align with their findings, showing a notable enhancement in skill scores post-intervention in the experimental group. This underscores the necessity of practical, hands-on training in educational packages.

3. **Chlan and Savik (2011):** Chlan and Savik highlighted the impact of education on ICU nurses' knowledge of mechanical ventilation, reporting improvements in knowledge and confidence. Our study corroborates these results, with the experimental group exhibiting increased knowledge and skill levels. This suggests that educational interventions not only improve knowledge but also boost confidence in clinical practice.
4. **Hofhuis et al. (2008):** This study evaluated educational interventions to improve ICU nurses' knowledge and found similar positive outcomes. Hofhuis et al. reported that structured education led to significant improvements in both knowledge and practical application, consistent with our findings. This highlights the effectiveness of structured educational packages in enhancing clinical skills.
5. **Burns and Delgado (2019):** In their book on critical care nursing, Burns and Delgado emphasize the role of continuous education in improving patient outcomes. Our study supports this assertion, showing that an educational package can lead to significant improvements in the competencies required for effective mechanical ventilation management. This underscores the broader implications of nurse education on patient care quality.

Implications for Nursing Practice

1. **Regular Educational Interventions:** The significant improvements observed in the experimental group suggest that regular, structured educational interventions should be integrated into ICU training programs. This can ensure that nurses remain updated with the latest knowledge and practices in mechanical ventilation.
2. **Focus on Practical Skills:** The notable enhancement in skill scores highlights the importance of practical training. ICU training programs should emphasize hands-on sessions and simulations to improve the practical competencies of nurses.
3. **Policy Development:** Hospitals and healthcare institutions should develop policies that support continuous professional development for nurses. This includes providing opportunities for ongoing

education and ensuring that educational programs are aligned with the latest advancements in critical care.

- 4. Enhanced Patient Care:** Improved knowledge and skills among ICU nurses can lead to better patient outcomes. By investing in nurse education, hospitals can ensure higher standards of patient care, particularly in critical care settings.

Limitations

- **Sample Size:** The small sample size of nine participants in each group limits the generalizability of the findings. Future studies should include larger samples to validate the results.
- **Short Follow-up Period:** The assessment was conducted only seven days post-intervention. Longer follow-up periods are needed to evaluate the long-term retention of knowledge and skills.

Future Research

Further research is needed to explore the long-term impact of educational interventions on nursing practice and patient outcomes. Studies should also investigate the effectiveness of different types of educational packages and delivery methods, such as online modules, workshops, and simulations.

Conclusion

The educational package on mechanical ventilation was effective in significantly improving the knowledge and skills of ICU nurses. Such interventions are crucial for ensuring high standards of patient care in critical settings.

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