

The impact of teaching on nurses' knowledge to VAP prevention bundle

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Abstract

Introduction: There are limited Indian studies that evaluate the nurses' knowledge of VAP prevention bundle. **Aim:** Our study aimed to assess the effectiveness of a structured teaching programme on VAP bundle among staff nurses in critical care unit. **Methodology:** The prospective, quasi-experimental study was conducted among critical care nurses. The final sample (n=57) nurses was selected by purposive sampling technique on the basis of set inclusion criteria. The nurses were first assessed for their knowledge of guidelines to prevent VAP. They were then educated using a standard teaching module and the assessment performed again. **Results:** There was a statistically significant increase in the knowledge level of participants by a mean (\pm S.D) 5.68 (\pm 2.8) score with 95% C.I (4.94 – 6.43) and $p < 0.001$. **Conclusion:** The 2-hour teaching module significantly enhanced nurses' knowledge towards evidence based guidelines for the prevention of VAP.

Keywords: Ventilator associated pneumonia, nursing education, prevention bundle

Introduction

Ventilator associated pneumonia (VAP) develops in patients ventilated mechanically for more than 48 hours. It is one of the common nosocomial infections in ICU and a major cause of morbidity and mortality in the intensive care unit. It is a preventable and occurs secondary to endotracheal intubation and mechanical ventilation.

VAP is associated with increased morbidity, mortality, duration of hospitalisation and cost of treatment. In 2012, the International Nosocomial Infection Control Consortium (INICC) reported VAP rate of 10–41.7% per 1000 ventilator days. The mortality attributable to VAP ranged from 16% to 94%. 86% of nosocomial pneumonia was associated with intubation and mechanical ventilation.¹

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VAP occurs due to aspiration of oropharyngeal secretions, regurgitated gastric contents including gastric fluid and enteral feeds. This is the primary route of transmission of pathogens into the lungs. It can also occur due to previously colonised bacteria or pre-existing bacterial lung infection. Cross infection is another major cause of VAP in the ICUs.² INICC Guidelines to prevent VAP are easy to implement and has been shown to improve patient outcome.^{3–5}

Studies have shown that nurses lack knowledge of evidence based guidelines for the prevention of VAP.^{6–11} This study was conducted to evaluate knowledge of these guidelines among the critical care nurses and whether a 2-h teaching module would improve their knowledge.

Methods

This was a quasi-experimental study conducted among critical care nurses by using a single group pre-test, post-test design at a large corporate hospital in South India. The sample was selected by purposive sampling technique on the basis of the set. Fifty seven registered nurses caring for patients in critical care unit and who were willing to participate

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in the study were included. Those who did not give their consent for participation and those who had already attended a formal teaching programme on VAP bundle were excluded from this study.

A structured, expert-validated questionnaire that measured knowledge containing 20 questions on the Nosocomial Infection Control Consortium (INICC) guideline was used. A pre-test was conducted initially to assess the current level of knowledge of adult critical care nurses about evidence based guidelines for the prevention of VAP. A 2-hour teaching module on how to practice evidence based guidelines for the prevention of VAP was then used to educate them on the subject. The teaching module was followed immediately by a reassessment using the same questionnaire.

Statistical analysis was conducted using SPSS version 20. Pre-test post-test analysis in paired sample 'T' test was performed, mean difference with SD and 95% confidence interval was obtained. P less than 0.05 was considered statistically significant.

Results

All the 57 participants attended this teaching module. Table 1 shows the demographic data of the participant nurses. Majority of them were female (92.9%, 53/57). Twenty five of the fifty seven nurses (43.8%) had 0 – 1 year experience of caring for critically ill patients.

Paired Samples Test

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|--------|------------------------|--------------------|----------------|-----------------|---|-------|--------|----|-----------------|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence interval of the difference | | | | |
| | | | | | Lower | Upper | | | |
| Pair 1 | Post total - Pre total | 5.684 | 2.798 | .371 | 4.942 | 6.427 | 15.339 | 56 | P < 0.001 |

Discussion

The educational intervention significantly improved the knowledge level of the critical care nurses on evidence based guidelines for VAP prevention. The post-test scores were low but still better than the pretest scores. The results of the pre-test showed that the knowledge of the majority of the nurses regarding the guidelines for prevention of VAP was low.

Table 1: Demographic variables of the participants (N = 57)

| S.No | Variables | Frequency N (%) |
|------|---|-----------------|
| 1 | Age | |
| | • 21 – 24 years | 40 (70.1) |
| | • 25 – 28 years | 13 (22.8) |
| | • 29 – 32 years | 3 (5.2) |
| | • 33 – 36 years | 1 (1.7) |
| 2 | Sex | |
| | • Male | 4 (7.1) |
| | • Female | 53 (92.9) |
| 3 | Highest level of professional qualification | |
| | • Diploma | 25 (43.8) |
| | • B.Sc (Nursing) | 32 (56.1) |
| 4 | Year of experience | |
| | • 0 – 1 years | 25 (43.8) |
| | • 2 – 4 years | 28 (49.1) |
| | • 5 – 7 years | 04 (7.1) |

Table 2 shows that there was a difference in mean (and standard deviation) scores from baseline (10.68 ± 2.9) to post-test (16.37 ± 2.1). As compared to pre-test, the staff nurses showed significant increase in the knowledge level [Mean (S.D) 5.68 (2.8) with 95% C.I (4.94 – 6.43) and p < 0.001] after the education.

Table 2: Descriptive statistics scores for knowledge of evidence based practice for prevention of VAP among critical care nurses (n=57)

| Characteristics | Mean ± SD | P value |
|-----------------|--------------|---------|
| Pre test | 10.68 ± 2.90 | < 0.001 |
| Post test | 16.37 ± 2.13 | |

The existing literature research conducted in the field of VAP showed that nurses generally are not updated in their knowledge. Majority of the nurses acquire knowledge from their basic educational programs after which they learn by on-the-job training from the respective peers and intensivists. This learning alone is insufficient. It is important that new nurses are supervised by an experienced and knowledgeable nurse/intensivist within the

clinical settings to help them apply the concepts learnt into real patient care. The analysis revealed that their basic level of knowledge was low but a significant improvement can be expected after the teaching.

This study was conducted to evaluate the nurses' knowledge and the improvement with education. A larger and more detailed study would be required to evaluate whether such educational intervention actually results in a reduction in the incidence of VAP, both short term and long term improvement in patient care and outcome. Retention of knowledge, factors affecting retention of knowledge, change in nurses' practice and motivation of nurses in keeping updated need further investigation.

In conclusion, nurses working at critical unit have a knowledge gap regarding prevention of VAP among ventilated patients. The training sessions improved the knowledge of nurses.

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