

Effect of Structured Teaching Programme on Nurses Knowledge to VAP Prevention Bundle

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Abstract

There are limited Indian studies which evaluated the nurses' knowledge to VAP (Ventilator-assisted pneumonia) prevention Bundle. Focused training of health care workers to prevent VAP is essential in all ICUs, particularly in ICUs in resource-limited countries. This study aimed to assess the effectiveness of structured teaching programme on VAP bundle among staff nurses in critical care unit. This prospective, quasi-experimental study was conducted among 171 nurses selected by purposive sampling technique on the basis of the set inclusion criteria. Majority of study subjects were female (92.9%), majority of the nurses (82%) were only degree holders, and 75 (43.8%) nurses had 0-1 year experience of caring for critically ill patients. The knowledge level of participants had mean SD of 5.68 (2.8) with 95% C.I (4.94 - 6.43) and $p < 0.001$. To conclude the 2-hour teaching module significantly enhanced nurses' knowledge towards evidence-based guidelines for the prevention of VAP.

The patients rely on health care professionals for their early recovery. Patients with ICU need constant medical support to maintain organ functioning and prevent complications due to diseases. Unfortunately, complications also occur due to sophisticated medical equipments. One such equipment is the Ventilator, which predisposes to the complication of ventilator-associated pneumonia (VAP). VAP is defined as pneumonia that develops in an intubated patient after 48 hours of mechanical ventilation; it is diagnosed by the Modified Clinical Pulmonary Infection Score more than six. It is a preventable secondary consequence resulting from intubation and mechanical ventilation. VAP can be prevented by a combination of interventions which constitutes the VAP bundle.

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 from 10 percent to 41.7 percent per 1000 ventilator days; crude mortality was attributed to VAP, range from 16 percent to 94 percent. Length of ICU stay more than 7 days; 86 percent of nosocomial pneumonia was associated with intubation and mechanical ventilation (Cook, 1998).

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Objectives

The objective of the study was to assess the effectiveness of structured teaching programme on VAP bundle among staff nurses in critical care unit.

Literature Review

Studies have shown that nurses lack knowledge of evidence-based guidelines for the prevention of VAP, a lack of knowledge may be a barrier to adherence. Therefore, a study was conducted to identify whether a 2-hour teaching module can have a positive effect on nurses' knowledge to practice evidence based guidelines for the prevention of VAP. The purpose of this study was to identify the critical care nurses knowledge of evidence-based guidelines for the prevention of VAP.

Aloush (2017) conducted a study to evaluate the effectiveness of an educational course that aimed to expand student nurses' knowledge about the guidelines for ventilator-associated pneumonia (VAP) prevention. In the pre-test, the students revealed poor knowledge (mean score $\pm$ SD, 6.3 ± 2.8 out of 20). After completion of the educational programme, participants in the experimental group showed a significant improvement ($t_{105} = 14.9$, $p < 0.001$).

Al-Sayaghi, et al (2014) conducted a descriptive cross-sectional survey was carried out to evaluate the knowledge of nurse's working in all ICUs in Sana'a city, capital of Yemen. The survey was carried out using a self-administered questionnaire. The

Table 1: Demographic variables of the participants (n=171)

S.No.	Variables	Frequency (N)	%
1	Age 21 – 24 years 25 – 28 years 29 – 32 years 33 – 36 years	120 39 9 3	70.1 22.8 05.2 01.7
2	Sex - Male - Female	12 159	07.1 92.9
3	Highest level of professional qualification - Diploma - BSc (N)	30 141	18 82
4	Experience 0 – 1 years 2 – 4 years 5 – 7 years	75 84 12	43.8 49.1 07.1

Table-2: Descriptive statistics scores for knowledge of evidence-based practice for the prevention of VAP among critical care nurses (n=171)

Characteristics	Mean	Median	Mode	SD
Pre-test	10.68	9	9	2.904
Post-test	16.37	16	16	2.127

nurses' knowledge mean total score was 47.3 percent (7.1 on 15 items). Knowledge of evidence-based strategies for preventing VAP is low among the majority of nurses working in Yemen ICUs (73.4% of nurses scored <60%). These results stress the need of hospitals to organise and implement in-service educational programmes for infection prevention in general, and for VAP prevention in particular, for all staff involved in the care of the mechanically ventilated patients (Al Sayaghi, 2014).

Methods

The research design selected for the study was quasi-experimental type, and it was conducted at a territory care hospital at Coimbatore, Tamilnadu, India. The final sample (N=171) was selected by purposive sampling technique on the basis of the set

Inclusion criteria: Nurses who were willing to participate in the study, and registered for patients in critical care unit were included.

Exclusion criteria: Those who didn't give their con-

sent for participation and those who had already attended formal teaching programme on VAP bundle was excluded from this study were excluded.

The Tool for Data consisted of two sections.

Section A: Demographic variables of the patient such as age, sex, qualification, years of experience.

Section B: Structured questionnaire which measures knowledge, a self-developed tool, consisting of 20 multiple choice questions based on the International Nosocomial Infection Control Consortium (INICC) guideline, was adopted.

The tool content was validated by experts. The field testing of the tool was conducted among a similar population as the study participants. To identify the existing level of knowledge of nurses caring for adult patients in critical care areas regarding evidence-based guidelines for the prevention of VAP, a pre-test was conducted. Post-test conducted immediately after the 2 hour teaching module. All the 171 participants attempted post-test, which was conducted immediately after the teaching module was delivered.

Intervention: The 2-hour teaching module on evidence based guidelines for the prevention of VAP.

Statistical analysis: SPSS version 20 was employed. Pre-test post-test analysis in paired sample 'T' test was performed. Mean difference with SD and 95 percent confidence interval was obtained. A p value less than 0.005 was considered statistically significant.

Results

A simple and concise demographic data sheet was used to collect primary relevant information about the participants.

Paired 't' test was used to compare the pre- and post-knowledge scores for statistical significance.

Majority of study subjects were female (92.9%; 159 /171) (Table 1). Majority of the nurses (82%) were only degree holders, and 75 (43.8%) nurses had 0-1 year experience of caring for critically ill patients.

Table 2 shows that there was a difference in mean and standard deviation from baseline (10.68±2.9) to post-test 1 (16.37±2.1). As compared to post-test, the knowledge assessment of VAP Prevention bundle in staff nurses showed significant increase in the knowledge level of participants with mean SD of

		Paired differences					t	df	Significance (2-tailed)
		Mean	Standard deviation	Standard 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	0.000 p < 0.001

5.68 (2.8) with 95% CI (4.94-6.43) and $p < 0.001$.

Discussion

This study highlights the educational intervention significantly improved the knowledge level of the staff nurses regarding evidence-based guidelines for VAP prevention. Educating providers will be most useful in a multidisciplinary team approach, in conjunction with implementation of VAP prevention bundle to decrease the VAP incidence rates. However, with this data it is clear that concentrated efforts to change the nurses practice towards the VAP prevention.

However, they also highlighted the fact that few participants scored lower in post-test; the scores in post-test were still overall better than the scores of the pre-test. The results of the pre-test highlighted that majority of the nurses had a significantly low level of knowledge regarding evidence-based guidelines for the prevention of VAP. It can be inferred that clinical teaching with effective mentoring is crucial besides class room teaching. It is also important that new nurses be provided supervision within the clinical settings to help them integrate the learned concepts into real patients care.

Modi et al (2017) conducted a descriptive cross-sectional study of 151 post graduate students using a pre-validated multiple-choice questionnaire developed for post graduate students to evaluate knowledge of VAP and its prevention. All Medical and Physiotherapy PG students posted in ICU and High Dependency Ward were included in the study. The difference between the knowledge of male and female participants was statistically significant ($p < 0.001$). Similarly statistically significant difference was seen between various fields ($p < 0.0001$) while other variables like ICU experience and different courses were not statistically significant by using ANOVA test ($p = 0.466$; $p = 0.084$).

Korhan et al (2014) conducted a study on the median value of total points scored by nurses on the questionnaire was 4.00 ± 2.00 . The difference between the nurses' education levels, duration of work experience and participation in in service training programmes on ventilator-associated pneumonia prevention and the median value of their total scores on the questionnaire was found to be statistically significant ($p < 0.05$).

Recommendations

Retention of knowledge is still an issue and needs further investigation if there is a change in nurses'

practice and decrease in the incidence of VAP. It would be worthy to explore the factors affecting retention of knowledge.

Studies focusing on attitudinal change seem to be an important area of research. Moreover, nurses own motivation towards availing opportunities for learning, through attending continuing education sessions needs to be explored.

Conclusion

Nurse working at critical unit are having knowledge gap to be able to prevent incidence of VAP among ventilated patients. The 2-hour teaching module significantly enhanced nurses' knowledge towards evidence-based guidelines for the prevention of VAP.

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