
ORIGINAL ARTICLE**Knowledge of Critical Care Provider on Prevention of Ventilator Associated Pneumonia**

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Abstract:

Background: Ventilator-associated pneumonia (VAP) continues to be an important cause of morbidity and mortality in ventilated patient. Prevention of VAP in critically ill patient is significant concern for health care team in intensive care units (ICUs). Knowledge on prevention of VAP would have a significant impact on patient outcome. **Aims and Objectives:** To assess knowledge on prevention of VAP in critical care providers and to find the association between knowledge on prevention of VAP and educational qualification and years of experience in ICUs. **Settings and Design:** The study was conducted in 5 different ICUs of Kasturba Hospital, Manipal, and using descriptive study design. **Material and Methods:** The study involved a purposive sample of 138 critical care providers. Critical care providers who were willing to participate in the study were included. Tools on demographic proforma and self-administered structured knowledge questionnaire on prevention of VAP were developed and content validity was established. The reliability of the tools was established. The data was categorized and analyzed by using descriptive and inferential statistics. The SPSS 16.0 version was used for the analysis of the study. **Result:** Majority 89.1% of the participant were 20-29 years, 63% unmarried 51.4% had completed diploma course and majority 81.2% were from nursing discipline. The study revealed that only 55.80% of subjects were having adequate knowledge on prevention of VAP based on median score. There was no significant association between knowledge score and educational qualification ($\chi^2=0$, $p=0.833$), years of experience in ICU ($\chi^2=2.221$, $p=0.329$).

Keywords: Knowledge, Ventilator associated pneumonia, critical care provider.

Introduction:

Intubation and mechanical ventilation both increase the risk of bacterial pulmonary infection because the invasive endotracheal tube allows direct entry of bacteria into the lower respiratory tract since the tube is located in the trachea. Bacterial colonization in the respiratory tract is further facilitated by the absence of the cough reflex and excessive mucus secretions in the mechanically ventilated patients [1]. The important pathogenic mechanisms in ventilator-associated pneumonia are pharyngeal colonization, micro aspiration, and exogenously acquired pathogens. Ventilator associated pneumonia accounts for about 47% of infections in patients in intensive care units [2, 3]. According to WHO, 8.7% of patients acquired hospital associated infection with mortality rate as high as 50% out of which VAP was the most common. Worldwide VAP is major clinical concern associated with high incidence rates, mortality rate and health care costs. In Europe, United States and Asia, VAP rates range from 9-40% and as high as 78 % and in Indian statistical analysis incidence of VAP is 8.7% to 37% [4].

Materials and Methods:

The study adopted descriptive survey design, and was conducted in 5 different ICUs of Kasturba Hospital, Manipal among 138 critical care providers in the month of February. Subjects were selected by purposive sampling technique. Critical care providers nurses, physiotherapist and respiratory therapist, who constantly provide the complex health care to a critically ill patients on mechanical ventilators, who were present on the day of data collection and who were

willing to participate in the study. Self-administered structured questionnaire to assess knowledge about prevention of VAP was developed and content validity was tested by giving it to seven experts from different medical and paramedical fields. Reliability of the tool was found out by administering the tool to 20 critical care providers working in ICU of Adarsh Hospital, Udupi district, Karnataka, after taking administrative permission. Split half method was used and tool was found to be reliable ($r=0.89$). The tool consisted of 33 items including demographic information. The questionnaire covered questions related to knowledge on VAP in the domain of etiology, risk factors and its preventive aspects. Multiple choice questions if answered correctly had a score of '1' and '0' for incorrect answer. The score ranged from 0-24 and it was categorized as adequate and inadequate knowledge based on the median score. The data was analyzed by using the descriptive and inferential statistic [5, 6].

The study was approved by the institutional ethics committee. Written informed consent was obtained from all the participants. Questionnaires were distributed to all critical care providers working in the studied ICUs after explaining the aim of the study in each shift for 2 days. Total 138 distributed questionnaires, reflecting an overall response rate of 100%. The Statistical Package for Social Science (SPSS version 16.0) was used to analyze the collected data. Demographic variables analyzed with frequency and percentage and to explore association between knowledge and educational qualification, years of experience of critical care providers Chi-Square test was used.

Results:

A total of 138 critical care providers were assessed. Most (89.1%) of the participants belonged to the age group of 20-29 years. Majority (71%) were females and 63% were unmarried. Most (49%) of the participants had completed diploma, 67% were from nursing discipline, 63.8% had total working experi-

ence > 2 years. Majority 63% of participants had experience of less than 2 years of working in ICU. None of the participants had attended workshop / conference related to VAP. The description of demographic variable is shown in (Table 1).

Table 1: Frequency and Percentage Distribution of Samples Characteristics (N=138)

Variables	Frequency (f)	Percentage (%)
Intensive Care Units		
ICU-1	31	22.5
CU-2	34	24.6
Causality ICU	26	18.8
Neurology ICU	22	15.9
Cardiology ICU	25	18.1
Gender		
Male	40	29.0
Female	98	71.0
Age (Years)		
20-29	123	89.1
30-39	009	06.5
>40	006	04.3
Marital status		
Married	49	35.5
Unmarried	87	63.0
Widow/Divorce	02	01.4
Discipline		
Nursing	112	81.4
Physiotherapy	010	07.8
Respiratory therapy	015	10.8
Educational Qualification		
Diploma	71	51.4
Graduation	67	48.8

Variables	Frequency (f)	Percentage (%)
Years of experience		
<2	50	36.2
2-5	68	49.3
6-10	5	3.6
>10	15	10.9
Years of experience in ICU		
<2	86	62.3
2-4	39	28.3
>4	13	9.4
Any workshop/conferences attended		
Related to VAP	0	0

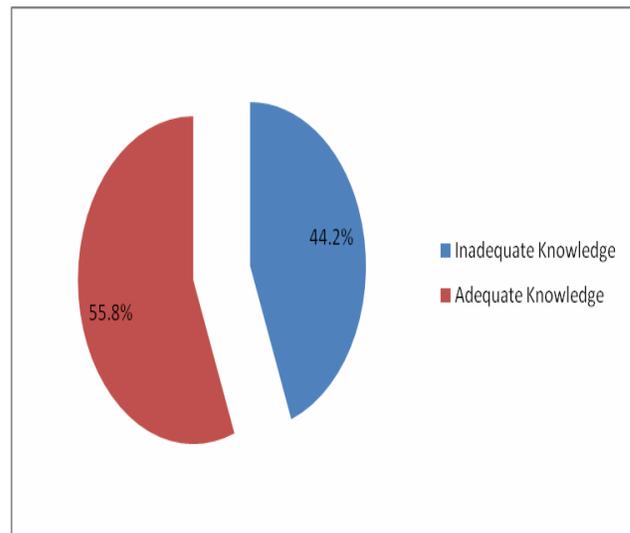


Fig. 1: Pie diagram representing the knowledge scores on prevention of VAP

Description of knowledge scores of critical care providers in terms of maximum, minimum, median and inter quartile range of scores were computed. Since the knowledge scores were not normally distributed, median and inter quartile range was calculated. The description is presented in (Table 2).

Distribution of knowledge scores on prevention of VAP were categorized as adequate and inadequate knowledge based on the median scores. Participants who scored less than 15 were categorized as inadequate knowledge and those who scored above or equal to 15 were categorized as adequate knowledge. Majority 55.80% of the participants had adequate knowledge and 44.20% had inadequate

knowledge on prevention of VAP based on the median score of 15. The description is represented in Fig-1.

In order to find association between the knowledge scores on prevention of VAP and educational qualification, years of experience in ICUs, Chi square values were computed which is shown in (Table 3).

The findings showed that there is no association between the knowledge scores on prevention of VAP and educational qualification, years of experience in ICUs where p value is >0.05. It is inferred that the knowledge on prevention of VAP is independent of educational qualification and years of experience.

Table 2: Description of Knowledge Score on Prevention of VAP in Terms of Median and Inter Quartile Range (N=138)

Variable	Minimum Score	Maximum Score	Median	IQR
Knowledge on prevention of VAP	10	21	15	13 - 17

Table 3: Chi square Values Computed between the Knowledge Scores on Prevention of VAP and Educational Qualification, Years of Experience in ICUs (N=138)

Variable	Inadequate knowledge	Adequate knowledge	df	χ^2	p-value
Educational Qualification					
Diploma	32	39	1	0.045	0.833
Graduation	29	38			
Years & Experience in ICU					
<2	42	44	2	2.221	0.329
2-4	15	24			
>4	4	9			

Discussion:

Majority (71%) were female critical care providers. Among the participants, 89.1% belonged to the age group of 20-29 years, 63% were unmarried and 81.2% were from nursing discipline and 51.4% had done diploma. 36.2% had total working experience less than 2 years. None of the participant had attended workshop/conference related to VAP.

In this study, 55.80% participants had adequate knowledge and 44.20% had inadequate knowledge on prevention of VAP. Thus it is inferred that a high proportion of the critical care providers have inadequate knowledge on prevention of VAP which can be improved by many strategies. This finding is supported by study conducted in American University of Beirut by Mohammad F among the 69 critical care providers in 2010. [7] The study findings showed adequate knowledge on prevention of VAP with knowledge score (Physician 80.2%, Nurses 78.1% and Respiratory therapist 80.5%) [8].

Current study has found that critical care provider's knowledge on prevention of VAP is statistically not associated with the educational qualification where p value >0.05. This is similar with the study conducted in Tanzania on Knowledge and practice of intensive care nurses on prevention of ventilator associated

pneumonia by T Ally 2012 which has indicated that there is no association between the educational qualification and knowledge on prevention of VAP [4]. Finding of current study are that there is no significant association between knowledge score on prevention of VAP and years of experience in ICU (p value > 0.05). This is similar with the findings of the Global European Study [9] and a study done in South Africa which indicated that there is no association between the level of knowledge, ICU training, years of experience and knowledge on prevention of VAP [10].

Conclusion:

The present study aimed to assess the knowledge on prevention of VAP among the critical care providers of ICU's in Kasturba Hospital Manipal, Udupi District, Karnataka and has shown a high proportion (44.2%) had inadequate knowledge. that there is a need to impart training to the ICU care providers about VAP for its prevention.

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