

A STUDY TO ASSESS KNOWLEDGE AND PRACTICE REGARDING PREVENTION OF VENTILATOR-ASSOCIATED PNEUMONIA AMONG NURSING STUDENTS

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ABSTRACT

Introduction: Ventilator-associated pneumonia (VAP) poses a significant threat to patients in intensive care units (ICUs), leading to increased morbidity, mortality, and healthcare costs. Nurses play a crucial role in preventing VAP through adherence to key practices such as hand hygiene and oral care. This study aims to assess the knowledge and practice of nursing students regarding VAP prevention, recognizing their vital role in future healthcare settings

Methodology: This study utilized a descriptive cross-sectional design to evaluate nursing students' knowledge and practice regarding VAP prevention. A total of 128 nursing students participated in the study. Data collection was conducted using structured questionnaires and checklists developed based on existing literature and expert input. Data were analyzed using descriptive statistics, and inferential statistics such as chi-square and correlation coefficient.

Results: The study result shows 54% students have moderately adequate knowledge and 52% student have moderately good practice in ventilator-associated pneumonia (VAP) prevention. Regarding correlation, a significant positive correlation ($r = 0.68$) between knowledge and practice levels was observed. Regarding association demographic variables showed no significant associations with knowledge/practice except the year of study notably influenced knowledge levels, with a substantial association noted ($\chi^2 = 13.03, p = 0.042$).

Conclusion: In conclusion, this study highlights commendable levels of knowledge and practice among nursing students regarding VAP prevention. The findings underscore the importance of understanding and implementing evidence-based practices in future healthcare professionals. Tailored educational strategies are essential to further enhance VAP prevention practices among nursing students and ensure optimal patient outcomes in critical care settings.

Keywords: Ventilator-associated pneumonia, pneumonia, VAP prevention, nursing students, knowledge, practice.

INTRODUCTION

Ventilator-associated pneumonia (VAP) is a significant concern in healthcare settings worldwide, particularly in intensive care units (ICUs). It represents a serious complication for patients undergoing mechanical ventilation, often leading to increased morbidity, mortality, and healthcare costs.¹ Ventilator-associated pneumonia (VAP) is a grave concern in critical care, occurring 48 hours or more after endotracheal intubation and mechanical ventilation. It ranks among the most prevalent nosocomial infections, affecting approximately 10% of ventilated patients, influenced by factors like patient demographics, duration of ventilation, and adherence to preventive measures. The ramifications of VAP are profound and diverse.² Patients afflicted with VAP endure prolonged hospitalizations, heightened antibiotic administration, increased susceptibility to multi-drug resistant organisms, and elevated mortality rates up to 50%.

Moreover, VAP exacts a significant financial toll on healthcare systems, necessitating extended ICU stays, intensive care, and costly treatments.³ Nurses are vital in preventing and managing ventilator-associated pneumonia (VAP), implementing key practices like hand hygiene, oral care, and monitoring ventilator parameters. Their early detection skills aid prompt diagnosis and treatment initiation.⁴ However, effective VAP prevention requires collaboration, adherence to protocols, and ongoing quality improvement efforts. Strategies like ventilator bundle protocols have reduced VAP rates, yet further research is crucial for innovative prevention techniques to enhance patient outcomes.⁵

Understanding the educational needs and practical application of VAP prevention among nursing students is essential for curriculum development and ensuring patient safety in critical care settings. By assessing both knowledge and practice, this study contributes to the enhancement of nursing education and the implementation of evidence-based practices to mitigate the risk of VAP in healthcare settings.

METHODOLOGY

Research Design: An evaluation of nursing students' Knowledge and practice of VAP prevention was done using a descriptive cross-sectional study technique.

Study Setting & Participants: Participants were recruited from undergraduate nursing programs at alwar nursing college, using convenience sampling methods. A total of 128 nursing students participated in the study.

Sampling Technique: The study participants were selected using a stratified random sampling technique combined with a lottery method. This method enabled the random selection of participants while also ensuring representation from various demographic scale within the

population.

Data collection tool: Data collection was carried out using structured knowledge questionnaire and checklist developed based on existing literature and expert input. Additionally, it included 30 items related to knowledge about prevention of VAP, and 10 item related to practices about prevention of VAP.

Data Analysis: By using descriptive data analyzed by mean, mode, median and SD along with inferential data analyzed by chi-square and correlation coefficient.

RESULT

Table 1: demographic characteristics of the study participants

N=128

Demographic Characteristic	Frequency	Percentage (%)
Age (years)		
18-20	42	32.81
21-23	58	45.31
24-26	18	14.06
27 and above	10	7.81
Gender		
Male	50	39.06
Female	78	60.94
Year of Study		
First Year	36	28.13
Second Year	40	31.25
Third Year	36	28.13
Fourth Year	16	12.50
Residential Area		
Urban	90	70.31
Rural	38	29.69

The table 1 reveal a diverse representation of nursing students across various factors. The largest age group falls within 21-23 years, comprising 45.31% of the participants, followed by those aged 18-20 years at 32.81%. Gender distribution shows a higher percentage of female

participants (60.94%) compared to males (39.06%). Regarding the year of study, participants are relatively evenly distributed, with around a third in each of the second and third years, and smaller percentages in the first and fourth years. In terms of residential area, the majority (70.31%) reside in urban areas, with 29.69% from rural areas.

Table 2. Level of Knowledge regarding Prevention of Ventilator-associated Pneumonia (N = 128)

S. No	Level of Knowledge	Frequency	Percentage
1.	Inadequate knowledge	6	4
2.	Moderately adequate knowledge	69	54
3.	Adequate knowledge	53	42

The table 2 shows that 4% students demonstrated inadequate knowledge, while the majority, comprising 54%, exhibited moderately adequate knowledge. A significant portion, accounting for 42%, showcased adequate knowledge in this domain.

Table 3. Level of Practice regarding Prevention of Ventilator-associated Pneumonia (N = 128)

S. No.	Level of Practice	Frequency	Percentage
1.	Poor practice	15	12
2.	Moderately good practice	67	52
3.	Good practice	46	36

The table 3 approximately 12% exhibited poor practice, while a majority of 52% demonstrated moderately good practice. Notably, 36% showcased good practice in this domain.

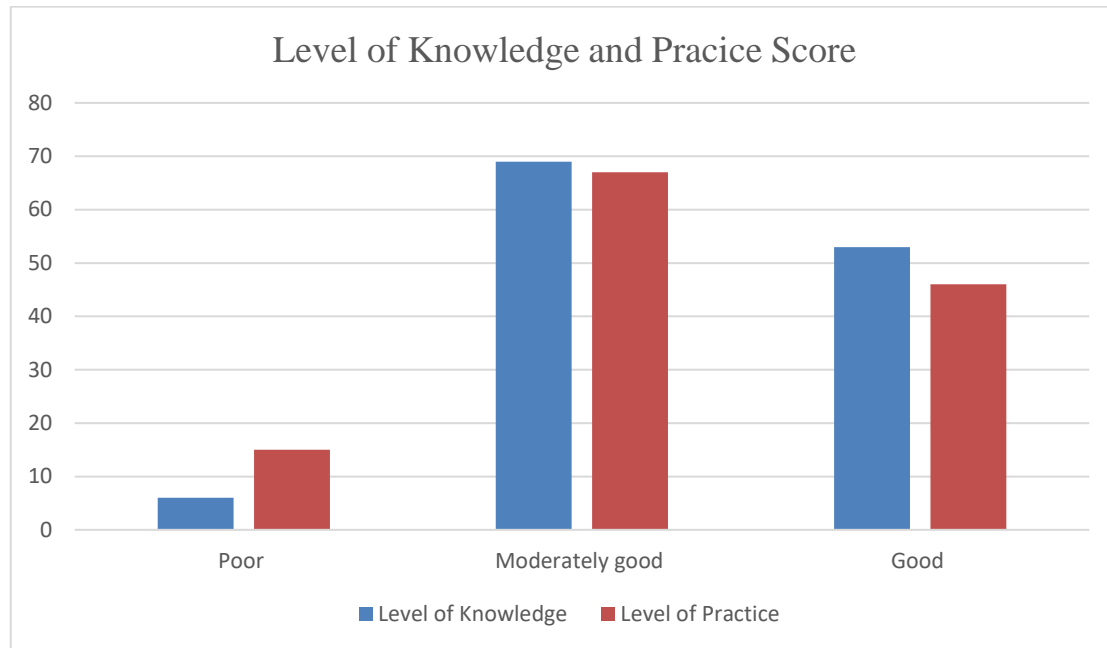


Figure 1. Bar diagram shows Level of Knowledge and Practice Score

Table 4. Coefficient of Correlation between Knowledge and Practice Scores

(N = 128)

S. No.	Variables	Mean	Standard Deviation	Coefficient of Correlation
1	Knowledge score	20.18	4.1	0.68
2	Practice score	6.03	1.7	

The above table 4 shows that mean knowledge score among participants was 20.18, with a standard deviation of 4.1, indicating a moderate level of dispersion around the mean. Additionally, the coefficient of correlation between knowledge and practice scores was calculated at 0.68, suggesting a moderately strong positive correlation between knowledge and practice levels.

Table 5. Association of Knowledge and Practice Scores with the Selected Demographic Variables

S. No.	Demographic Variables	Knowledge Association		Practice Association	
		χ^2 Value	p Value	χ^2 Value	p Value
1	Age	8.32	0.215	6.21	0.400
2	Gender	1.78	0.410	1.093	0.578
3	Year of Study	13.03	0.042*	9.31	0.156
4	Residential Area	0.96	0.618	1.02	0.600

The above table 5 association between demographic variables and knowledge and practice levels regarding the prevention of ventilator-associated pneumonia was examined using chi-square tests. For age, no significant association was observed with knowledge ($\chi^2 = 8.32$, $p = 0.215$) or practice ($\chi^2 = 6.21$, $p = 0.400$). Similarly, gender showed no significant association with knowledge ($\chi^2 = 1.78$, $p = 0.410$) or practice ($\chi^2 = 1.093$, $p = 0.578$). However, year of study exhibited a significant association with knowledge ($\chi^2 = 13.03$, $p = 0.042$), indicating variations in knowledge levels across different years of study, while no significant association was found with practice ($\chi^2 = 9.31$, $p = 0.156$). Similarly, residential areas demonstrated no significant association with knowledge ($\chi^2 = 0.96$, $p = 0.618$) or practice ($\chi^2 = 1.02$, $p = 0.600$), suggesting potential differences in practice levels between urban and rural areas.

DISCUSSION

The findings suggest that nursing students exhibit commendable levels of knowledge and practice regarding ventilator-associated pneumonia (VAP) prevention. The majority demonstrate moderately adequate knowledge and moderately good practice. The significant correlation between knowledge and practice underscores the crucial role of understanding in translating knowledge into clinical action. While no significant associations were found between demographic variables and knowledge/practice levels, a notable association between year of study and knowledge levels implies a progressive improvement in knowledge

acquisition throughout the nursing curriculum. This highlights the importance of tailored educational strategies to bolster VAP prevention practices.

In our study, a majority of participants demonstrated moderately adequate knowledge, with a significant portion showcasing adequate knowledge. Similarly a study by Getahun et al. (2022), a significant proportion of participants were found to have poor knowledge.⁶ While in contrast study by Ghimre et al. (2018), almost half of the respondents exhibited high knowledge regarding VAP prevention. These findings highlight variations in knowledge levels across different studies, emphasizing the importance of assessing and addressing knowledge gaps in VAP prevention among participants.⁷

In our study, a majority of participants demonstrated moderately good practice regarding the prevention of ventilator-associated pneumonia. Conversely, a study conducted by John et al. (2022) reported that the majority of nurses had an adequate level of practice.⁸ Similarly a study conducted by Kalyan et al. (2020) found that most nurses exhibited average practices.⁹ These findings suggest variations in practice levels across different studies, indicating the need for further investigation into factors influencing practice levels and the development of targeted interventions to enhance VAP prevention practices among healthcare professionals.

In our study, a moderately strong positive correlation was observed between knowledge and practice levels, indicating a coherent relationship between understanding and implementation of VAP prevention measures. Conversely, Hassan et al. (2021) reported no significant correlation between knowledge and practice scores among study subjects.¹⁰ Similar to our study, a study conducted by El-Sayed et al. (2023) found a statistically significant positive correlation was found between nurses' knowledge and their practice scores regarding preventing ventilator-associated pneumonia.¹¹ These contrasting findings suggest variability in the relationship between knowledge and practice across different studies, highlighting the complexity of factors influencing the translation of knowledge into clinical action in VAP prevention.

In our study, the year of study demonstrated a significant association with knowledge levels, indicating variations across different years of study, while no significant association was found with practice levels. Conversely, a study conducted by Kumar et al. (2022) reported no significance regarding the association between the level of knowledge and selected demographic variables.¹² Similarly, in another study conducted by Kumar et al. (2019), there was no significant association between the level of knowledge and knowledge on practices to prevent pediatric ventilator-associated pneumonia with selected sociodemographic variables.¹³ These findings suggest that while knowledge levels may vary across different years of study, demographic variables may not significantly influence knowledge or its translation into practice



in VAP prevention.

This study aimed to assess nursing students' knowledge and practice levels in preventing ventilator-associated pneumonia (VAP) and examine correlations with demographic variables. It holds significance in enhancing understanding of nursing education's role in VAP prevention and patient safety. Unanswered questions include factors influencing knowledge-practice gaps and effectiveness of targeted interventions. Future research could explore strategies to address these gaps and optimize VAP prevention efforts in healthcare settings.

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