

Practice of Intensive Care Unit Nurses toward Prevention of Ventilator-Associated Pneumonia at Public Hospitals in Sana'a City-Yemen

By

Abdul Fattah Saleh Mohammed AL-jaradi

**MSc. Critical Care Nursing
Sub-specialization (Respiratory Care)**

2020

Outline

Introduction

- ✓ *Background*
- ✓ *Problem statement*
- ✓ *Significance of the study*

Objectives

Research Methodology

Results

Conclusion and Recommendations

Introduction

Background of the study

Ventilator-associated pneumonia (VAP) is defined as a type of nosocomial pneumonia acquired by patients after at least 48 hours of their admission to hospital and receiving mechanical ventilation (MV).

VAP is characterized by a new or progressive pulmonary infiltrates, fever, leukocytosis and purulent trachea-bronchial secretions.

Introduction

Background Cont..

VAP increases the severity of illness as it elevates oxygen demands, sputum production, and produces alveolar collapse leading to impaired gas exchange.

Previous studies have estimated that more than 300,000 patients receive MV in the United States each year. These patients are at high risk for complications and poor outcomes, including death.

VAP is a serious health hazard among patients on MV.

Problem statement **Introduction**

The mechanical ventilation (MV) is an essential, lifesaving therapy for patients with critical illness, this process puts patients at high risk for complications such as VAP.

VAP is known to be one of the most serious infections acquired in ICUs, with an incidence of 6-60%, and a high morbidity-mortality rate and an increase in healthcare costs.

VAP is still an important cause of morbidity and mortality in mechanically ventilated patients. It remains a challenging problem in intensive care units (ICUs).

Introduction

Problem statement Cont..

Critical care nurses and respiratory career are playing an important role in identification of risk factors and prevention of AVP.

Prevention of VAP is primarily the responsibility of the ICU nurses and respiratory career, hence their knowledge and practices influence on the health outcome of ICU patients.

Therefore, the current study was aimed to assess the level of ICU nurses practice regarding prevention of AVP.

Introduction

Significance of the study

To provides baseline information on the level of ICU nurses' practice regarding prevention of VAP.

Provides a strong body of scientific research and recommendations, which would ensure to minimize the MV complications, improve standard care, promote effective/safe with highest standards of nursing care practice to improving patients' outcomes.

Improving patients' outcomes will shorten the patient's ICU length of stay, hospitalization as well as benefit the patient cost also, with decreased hospital costs.

Objectives

General Objective

To assessment of ICU nurses practice regarding prevention of ventilator-associated pneumonia at public hospitals in Sana'a City, Yemen.

Objectives

Specific Objectives

1. To determine the level of ICU nurses practice towards prevention strategies of VAP.
2. To explore the level of ICU nurses overall practice toward prevention of VAP.
3. To verify the association between sex, education level, years of working experience, ICU nurses training program and level of nurses' practice toward prevention of VAP.

Research Methodology

Study setting:

Public hospitals in Sana'a City, Yemen.

These hospitals are referral hospitals and provide primary, secondary and tertiary healthcare to all Yemeni people.

Study design

A descriptive, cross-sectional study was used.

Study duration

October 2017 to October 2018.

Study population

All Yemeni nurses working in ICU at public hospitals in Sana'a City were invited to participate in this study.

Methodology

Sample size determination cont..

- EpiCalc program, 2000 was used.
- The following parameters were used in sample size determination for **practice**:
 - Total population: 205 nurse
 - Precision: 4%
 - Confidence level: 95%
- The final sample size for practice was 50 Yemeni nurses.

Sampling Technique

- A stratified simple random sampling was applied to select the sample size from 4 major public hospitals in Sana'a City.
- The following formula was used to calculate the sample size from each stratum:

$$\frac{n}{N} * K = \text{sample size to each hospital}$$

n = sample size, N = study population and k = population of each hospital

Study setting	Total of Population	The study sample of practice
Al-Thowrah hospital	98	24
Al- Jomhury hospital	42	10
Al-Kuwait hospital	35	9
Al-Sabeen hospital	30	7
Total	205	50

Inclusion and exclusion criteria

1. Inclusion criteria

- Yemeni male and female nurses.
- Working in ICU in the selected hospitals.
- Had 1 year working experience or more.
- Had diploma degree or above.

2. Exclusion criteria

- Nurses who not fulfilling the above inclusion criteria.

Data Collection Methods and Tool

1. Data Collection Methods

The observation checklist was used to collect data through the period from 1st March to 30th May 2018.

2. Data Collection Tool

The observation checklist was applied to assess the actual nurses' practice on prevention of VAP. The observation checklist was included twenty observes.

Validity and reliability

Methodology

A. Validity of the Questionnaire Cont..

- **Content validity**

The observation checklist items was examined by five expert to affirm the content validity and identify areas of item improvement, omission or modification if needed.

- **Pilot study**

The observation checklist was done for understandability of the observes by distributing 10 copies among working nurses. The modifications and adjustments were made based on the responses in the pilot study.

Validity and reliability Cont..

B. Reliability of the Questionnaire

The reliability of the observation checklist was tested by using Cronbach's Alpha. The Cronbach's alpha scale was highly reliable about (0.73%).

Data processing and analysis

SPSS, version 22.0.

Data entered, cleaned and checked..

Descriptive analysis

- Frequency & percentage for categorical variables.
- Mean and standard deviation for numerical variables.

Inferential Analysis

P value ≤ 0.05 level.
Chi square for categorical data.

Methodology

Study Variables

- 1. Dependent variables:** The level practice of ICU nurses toward the prevention of VAP.
- 2. Independent variables:** the Scio demographical characteristics: (level education, years' experience and tanning courses).

Ethical Considerations

- Ethical approval was obtained from the ethics committee of the college of medical sciences of Al-Razi University prior to carrying out this study.
- The approval to conduct this study was also obtained from the directors of public hospitals.
- Informed consent was taken from all participated nurses.

Demographic Characteristics of ICU Nurses (N= 50)

Demographic data		F	%
Sex	• Male	20	40
	• Female	30	60
Marital status	• Married	25	50
	• Unmarried	25	50
Age (years)	• 20 - 30 years	33	66
	• 31 - 40 years	16	32
	• 41 - 50 years	1	2
Working experience (years)	• 1 - 3 years	27	54
	• 4 - 6 years	11	22
	• 7 - 9 years	5	10
	• ≥ 10 years	7	14
Level of education	• Diploma degree	33	66
	• Bachelor degree	16	32
	• Master degree	1	2

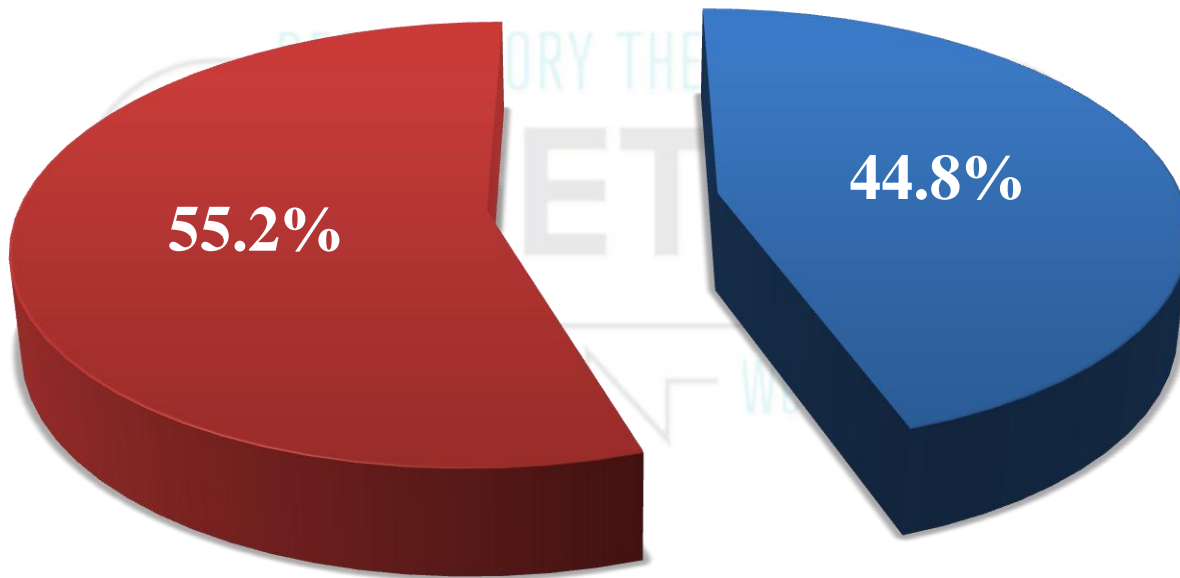
Distribution of ICU nurses according to course training(N= 50)

Statement	Responses			
	Yes		No	
	F	%	F	%
Do you have a degree or courses training in ICU?	24	48	26	52
Do you attend a training program on the prevention of VAP?	9	18	41	82
Do you have a diploma in respiratory therapy?	5	10	45	90

Practice of ICU nurses about common nursing care toward prevention of VAP(N= 50)

Practice	Outcomes			
	Yes		No	
	F	%	F	%
• Hand washing before oral care, tracheal suction, before, and after every patient care.	14	28	36	72
• Wear sterile gloves before oral care and tracheal suction	37	74	13	26
• Clean mouth using gauze and antiseptic solution (chlorhexidine).	16	32	34	68
• Apply water-soluble jelly to patient lips after oral care.	15	30	35	70
• Ensuring environmental cleanness and sterilization	30	60	20	30

Total practice of ICU nurses about common nursing care toward prevention of VAP (N= 50)

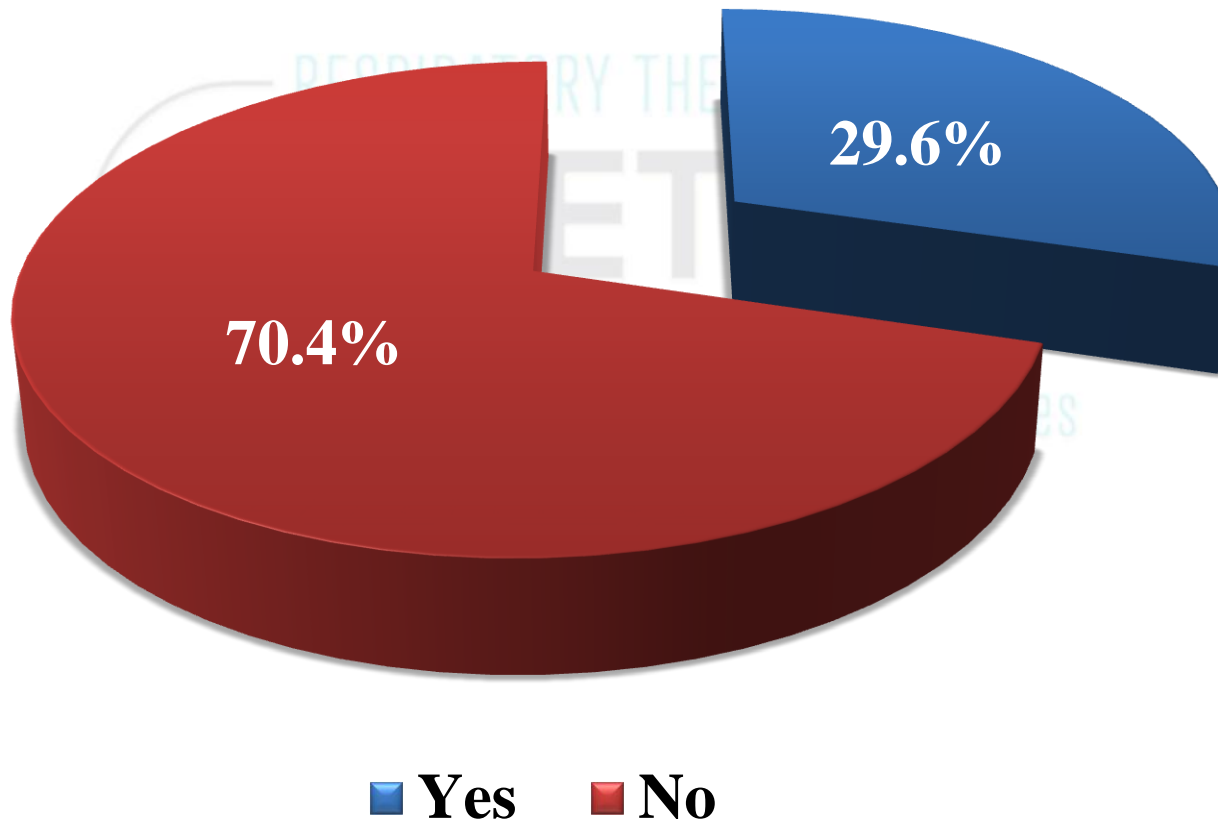


■ Yes ■ No

Practice of ICU nurses about suction strategies toward prevention of VAP(N= 50)

Practice	Outcomes			
	Yes		No	
	F	%	F	%
• Apply closed endotracheal suction system.	0	0	50	100
• Sterilized/disinfected of suctioning equipment	16	32	34	68
• Using sterile technique during tracheal suction	21	42	29	58
• Discard suction catheter immediately after one single use.	27	54	23	48
• Apply subglottic suctioning before deflating cuff or repositioning the tube.	10	20	40	80
• Control and maintenance of cuff pressure by using manometer system.	0	0	100	100

Total practice of ICU nurses about suction strategies toward prevention of VAP(N= 50)



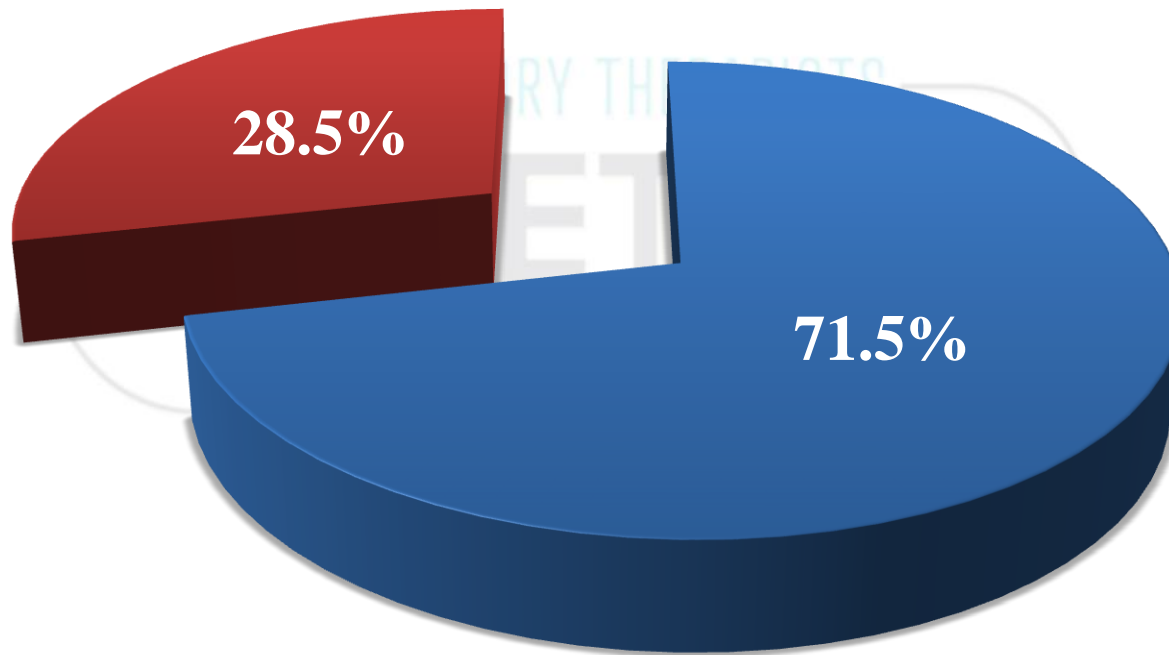
Results

Practice about position and ventilator equipment's care toward prevention of VAP(N= 50)

Practice	Outcomes			
	Yes		No	
	F	%	F	%
• Position a patient in a semi recumbent at (30° to45°)	39	78	11	22
• Position a patient in a semi recumbent at (30° to45°)	39	78	11	22
• Use the kinetic bed for a ventilated patient.	44	88	6	12
• Apply chest physiotherapy	31	62	19	38
• Avoidance of elective change of ventilator circuit, filters, humidifier and endotracheal tubes only with a new patient or when clinically indicated	29	58	21	42

Results

**Total practice about position and ventilator equipment's
toward prevention of VAP(N= 50)**



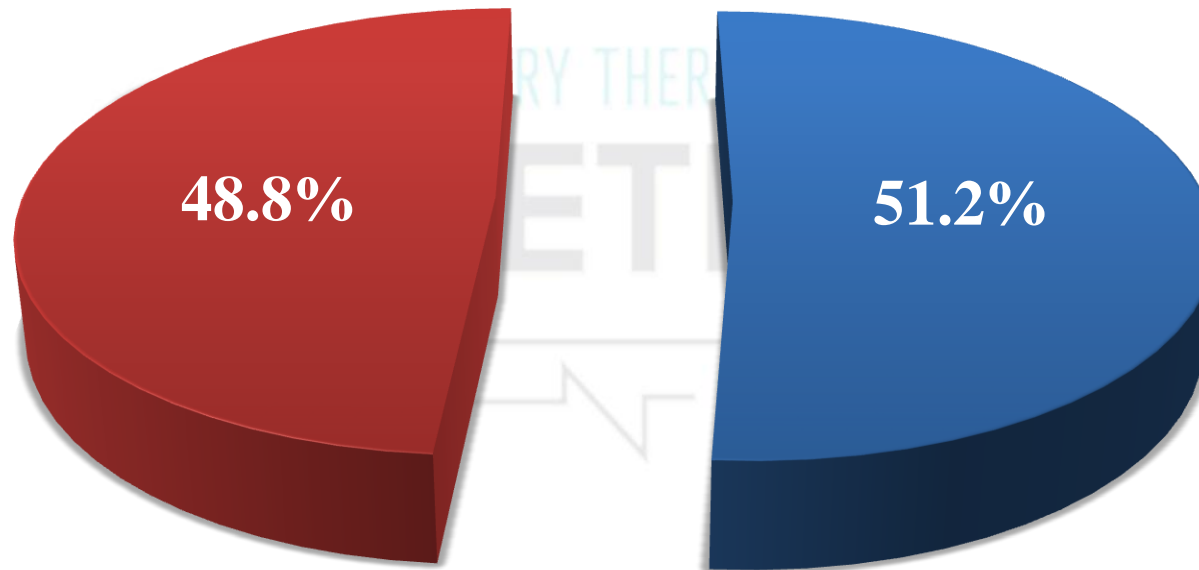
■ Yes ■ No

Results

Practice of ICU nurses about other nursing care toward prevention of VAP(N= 50)

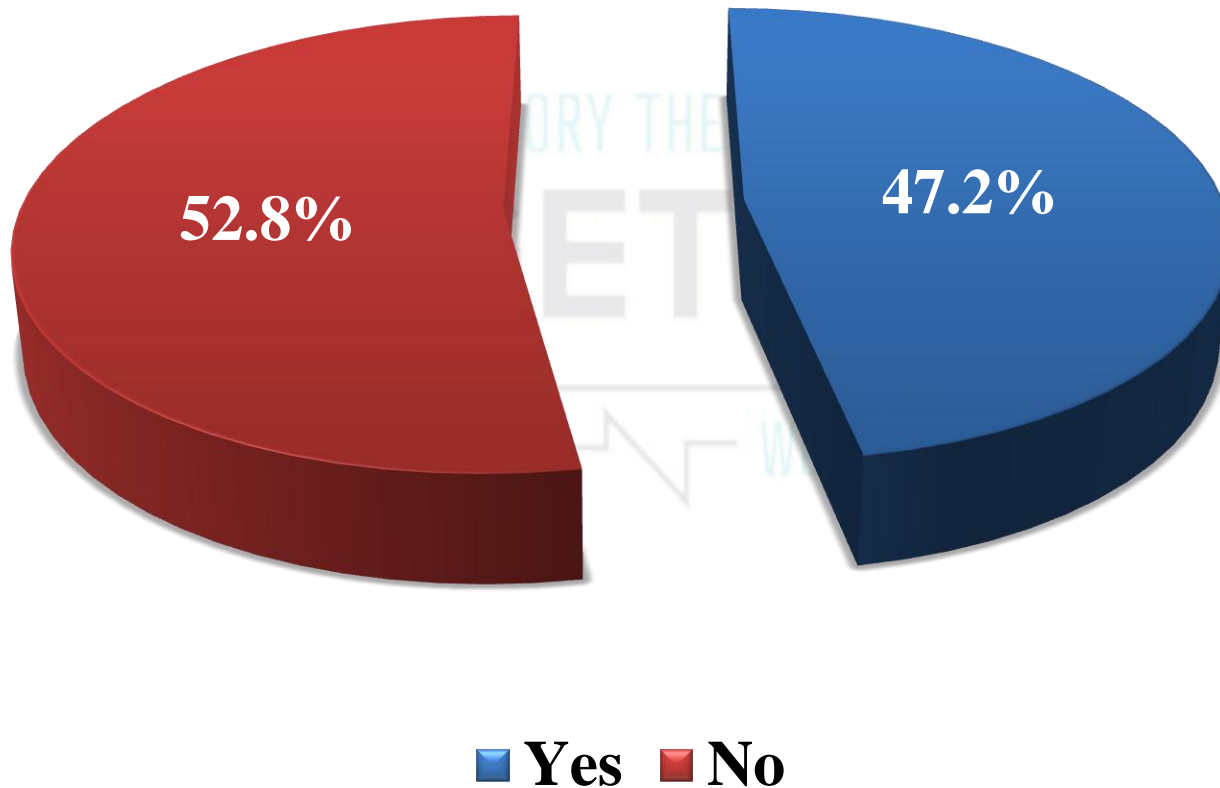
Practice	Outcomes			
	Yes		No	
	F	%	F	%
• Checking the nasogastric tube for residual volume through the esophagus	27	54	23	46
• Use of protocol for weaning from mechanical ventilation.	18	36	32	64
• Follow up a plan to Stopping the sedation drugs	16	32	34	68
• Apply assessment of readiness to weaning and extubation.	33	66	17	34
• Documentation	34	68	16	32

Total practice of ICU nurses about other nursing care toward prevention of VAP(N= 50)

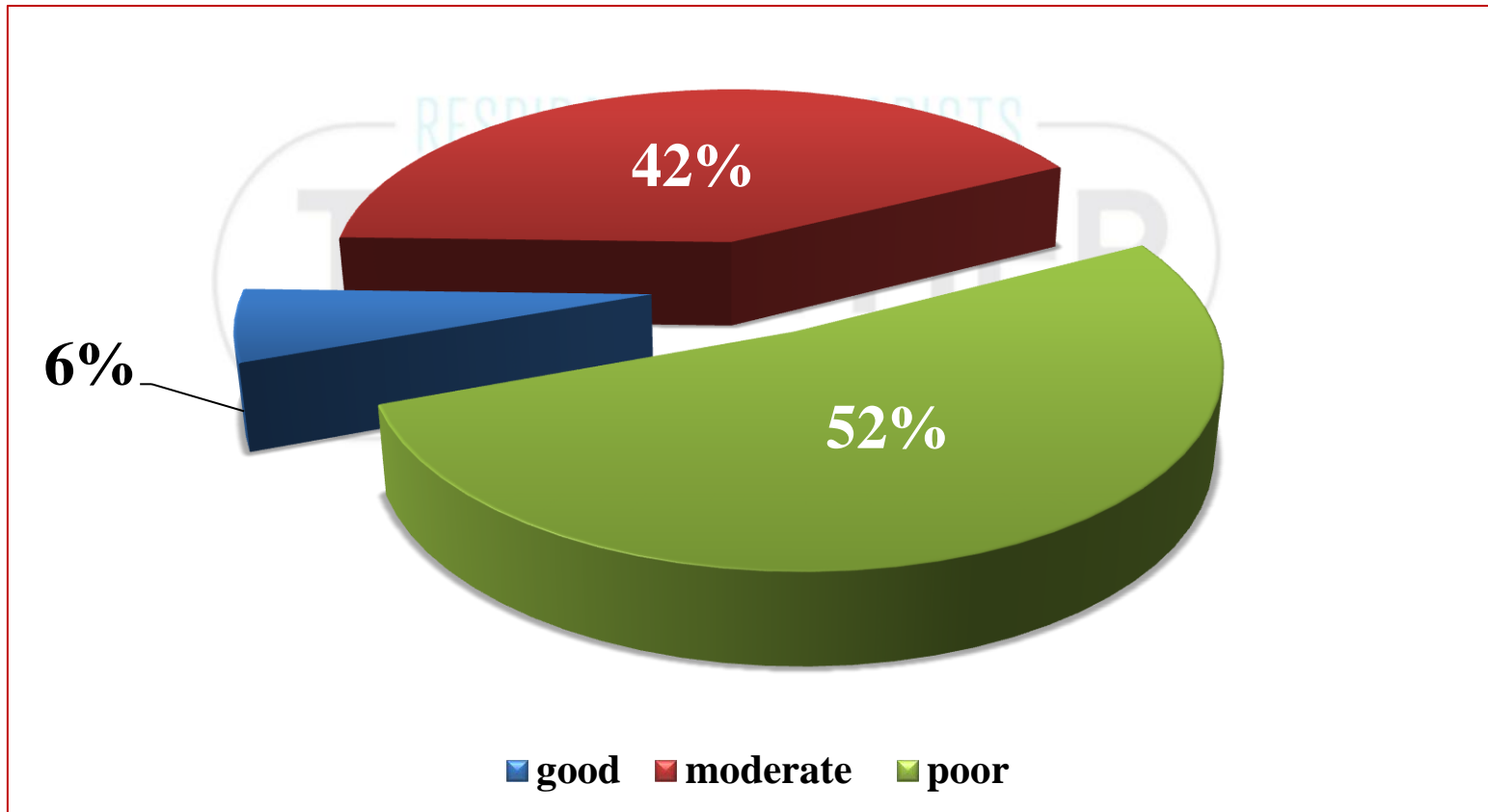


■ Yes ■ No

Overall practice of ICU nurses toward prevention of VAP(N= 50)



Overall level of practice of ICU nurses toward prevention of VAP(N=50)



Association between the level of practice and demographic characteristics of nurses toward prevention VAP (N= 87)

Items	Level of practice on prevention of VAP			p-value
	Good	Moderate	Poor	
Attended course training in ICU				0.03
• Yes	2	14	8	
• No	1	7	18	
Attended training programs on prevention of VAP				0.42
• Yes	1	5	3	
• No	2	16	23	
Sex				0.93
• Male	1	8	11	
• Female	2	13	15	
Marital status				0.23
• Unmarried	1	8	16	
• Married	2	13	10	
Educational level				0.40
• Diploma degree	3	13	17	
• Bachelor degree	0	8	8	
• Master degree	0	0	1	
Work experiences				0.03
• 1 to 3 years	3	7	17	
• 4 to 6 years	0	8	3	
• 7 to 9 years	0	1	4	
• ≥10 years	0	5	2	

Conclusion

- This study showed that all ICU nurses' were don't used the closed endotracheal suction system and don't used the manometer system to control and maintenance of ETT cuff pressure.
- More than half (52%). of ICU nurses were had a poor practice toward prevention of VAP.
- The current study revealed inadequate ICU nurses' practices on the most strategies toward prevention of VAP.
- ICU nurses' practice on prevention of VAP was statistically associated with ICU training and years of work experience.

Recommendations

Recommendations

Recommendations for Clinical Nursing Practice

- Training courses program and workshop on the evidence-based guidelines and strategies to the prevention of VAP are recommended to improve ICU nurses' knowledge and practice.
- Staff members should be motivated to continuing professional studying further and gaining more knowledge and skills in the ICU field and respiratory care.

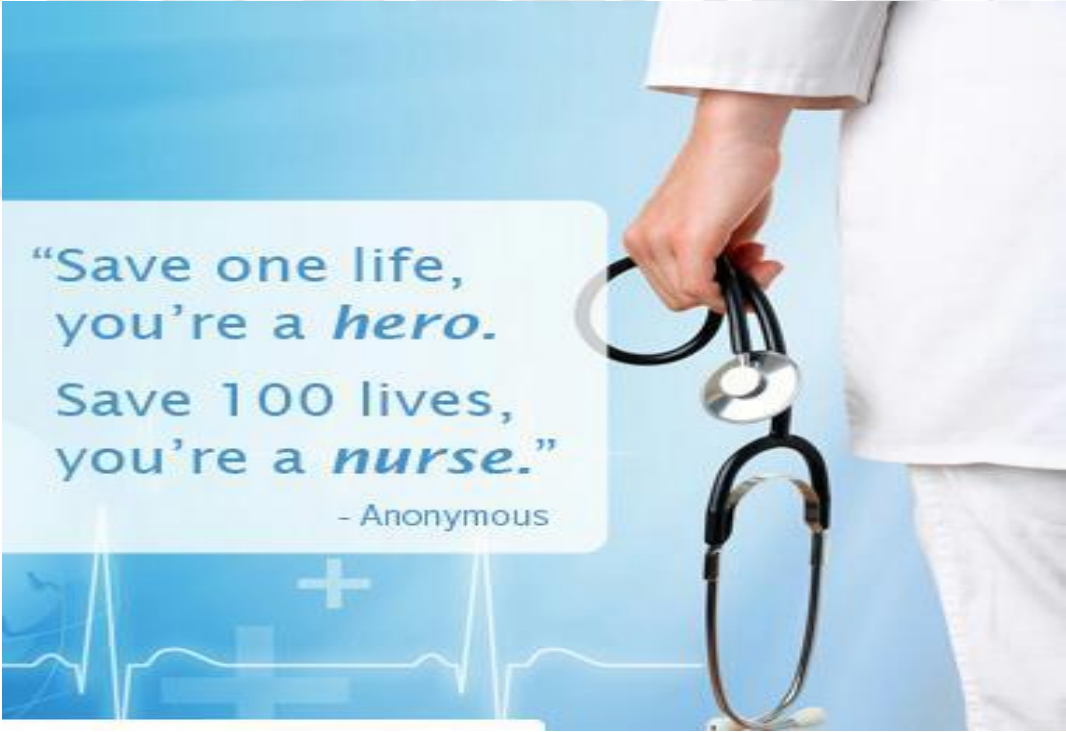
Recommendations

Recommendations

Recommendations for Nursing Research

- Further research on factors affecting implementation of VAP prevention strategies are recommended.
- Similar studies with large sample size in other hospitals that provide critical care in Yemen are recommended.
- Raise nursing student's interest in research to keep themselves updated with current practice.
- Resources such as articles journals and electronic resources such as computers and the internet should be made accessible in the units for staff members.

THANK YOU



“Save one life,
you’re a *hero*.
Save 100 lives,
you’re a *nurse*.”

- Anonymous