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## RESEARCH ARTICLE

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### KNOWLEDGE AND PRACTICES OF NURSES ON PREVENTION OF HOSPITAL ACQUIRED PNEUMONIA AT ISHAKA ADVENTIST HOSPITAL, BUSHENYI DISTRICT

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#### Abstract

In Uganda, hospital acquired pneumonia is the leading infection acquired from hospitals accounting for 33.3% of all hospital acquired infections. The purpose of this study was to explore knowledge and practices of nurses at Ishaka Adventist hospital on prevention of hospital acquired pneumonia. A quantitative cross sectional using a questionnaire assessed 44 nurses from Ishaka Adventist Hospital using convenient sampling method. Data obtained was analyzed using SPSS version 20.0 and presented in tables and figures. Results of the study found that 41(93%) of nurses had heard about prevention of HAP prevention, 8(44%) of nurses did not know that suctioning catheters for very sick patients are supposed to be used once to prevent HAP, 21(51.2%) of nurses knew recovery position as safer positions for nursing very sick patients in order to prevent developing HAP 30(73.2) of nurses knew cough as early warning sign HAP, 28(68.2%) of nurses knew prophylaxis for Hap prevention 40(97.6%) of nurses knew aseptic techniques as precautions necessary for HAP prevention. 30(75%) of nurses hand washed to patient to prevent HAP, 39(97.5%) never avoided giving their HAP high risk patients PPIs, 35(87.5%) sterilized all instruments used while caring for very sick and other HAP high risk patients to prevent HAP, 36(90%) did not do oral care using salt/chlorohexidine for HAP prevention and 40(100%) of nurses who never practices rotational therapy for very sick and bedridden patients for HAP prevention. In conclusion, the knowledge on HAP prevention was poor as well as HAP prevention practices.

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#### Introduction:-

Hospital-acquired pneumonia (HAP) refers to the development of parenchymal lung infection after at least 48 hours of hospitalization [1]. HAP is verified by the presence of a new pulmonary infiltrate on imaging or even cough, hyper secretion through oral cavity which a patient did not have 48 hours before admission [2-7].

Globally, guidelines are available for preventing Hospital-Acquired Pneumonia (HAP) and knowledge of HAP prevention is growing among nurses however; HAP incidence does not seem to be decreasing because of poor

prevention practices in most facility settings especially in low resource settings [8].

In United States of America (USA), 86.7% of nurses have knowledge on HAP prevention and there is a movement to achieve a “zero HAP” through practicing daily interruption of sedation for sedated patients, daily assessment of weaning readiness from intubations and ventilators, elevating the head of the bed between 130–45 degrees, and assuring the use of prophylaxis for deep venous thrombosis and intestinal bleeding [9].

In Africa, Ali [10] studied the cause and contributing factors of HAP in Africa using Egypt as an example and found only 26% of nurses with knowledge of HAP prevention and HAP practices were also at their lowest 13.5% among nurses despite them being immediate care givers of patients in hospitals.

In sub-Saharan Africa, HAP affects 35% of very sick patients in hospitals due to lack of prevention practices by nurses, the failure to practice HAP prevention have been attributed to low knowledge among nurses [11].

In East Africa, research studies have found practices of prevention of HAP effective, a case study by Janson et al. [12] in Tanzania nurses who cared for critically ill patients with HAP prevention practices at rate of 70% for a period of 3 months practices by nurses alone reduced rates of HAP from 33% to 18.3%.

## **Methodology:-**

### **Study Design and rationale**

A quantitative descriptive cross-sectional study employed quantitative method of data collection. The researcher assessed nurses that were present at the facility during the time of Data collection. The study design was selected because it helped the researcher to get the required information from study population in shortest time possible thus saving time and financial resources.

### **Study setting**

The study was carried out in Ishaka Adventist hospital (IAH) Bushenyi District. A missionary hospital located in Ishaka Municipality, Bushenyi district.

### **Study Population and rationale**

The study was carried out among nurses in Ishaka Adventist hospital. These were chosen because; they are the caring for all types of patients including those with stroke, extensive burns, pre and post-operative patents, immune suppressed among others who are at most risks for developing hospital acquired pneumonia unless proper interventions are taken. Hence their knowledge and practices could do much in protecting patients from HAP

### **Sample size determination**

The Sample size was determined by Yamane (1999) method in which the sample size is given by the expression :

$$n = \frac{N}{1 + N(e)^2}$$

n = desired sample size

e= level of precision 0.05 at 95% confidence interval

N= total number of nurses (50, which is a number of nurses at Ishaka Adventist hospital).

$$n = \frac{50}{1 + 50(0.05)^2}$$

=44

Therefore, 44 nurses were used for this research study as study sample size

### **Inclusion Criteria**

Nurses who were present at the time of data collection at IAH and consented to participate in the study

### **Exclusion criteria**

Nurses that declined to consent and those that were not be present at the time of data collection

**Analysis**

After data processing, data was analyzed using SPSS version 20.0 by help of a computer.

**Ethical Considerations**

On approval of this research proposal, an introductory letter was obtained from the research ethics committee of Kampala International University School of Nursing and was delivered to Medical Superintendent, IAH Bushenyi district and the purpose of the study will be explained to him.

After obtaining permission from the superintendent, an explanation was given to each nurse regarding the purpose and I also ensured that they were assured of absolute confidentiality. Only nurses that consented to voluntarily participate in this research study were enrolled for this study.

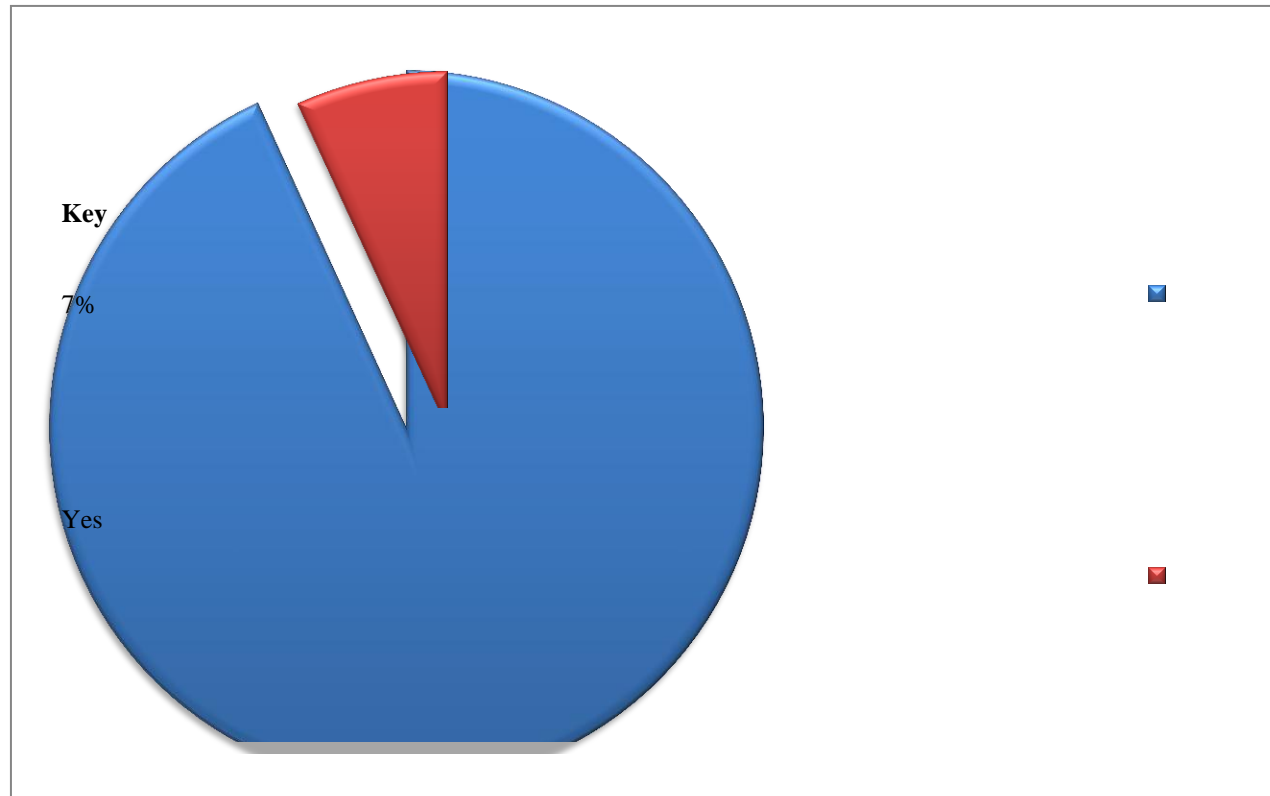
Information that was obtained was kept confidential from unauthorized personnel.

**Results:-**

**Table 1:-** showing demographic characteristics of nurses (n=44).

Character	Variable	Frequency (n)	Percent (%)
Age	18-27	18	41
	28-37	21	47.7
	37 and above	5	11.3
Sex	Male	12	27.3
	Female	32	72.7
Qualification	Certificate	39	88.6
	Diploma	5	11.4
Experience (years) in nursing practice	0-5	17	38.6
	6-10	13	29.5
	11-15	10	22.7
	Above 15 years	4	9.1

Findings from table 1 revealed most 21(47.7%) of nurses that were aged between 28-37 years and the least 5(11.3%) that were aged above 37 years. It was also revealed that majority 32(72.7%) of nurses were females and the remainder 12(27.3%) were male. It was also found out that almost majority 39(88.6%) were certificate nurses and only 5(11.4%) of nurses were diploma nurses. Furthermore, it was revealed that more than a third 17(38.6%) of nurses had 0-5 years of experience in nursing care and only 4(9.1%) of nurses had more than 15 years of experience in nursing care.



No

93%

**Figure 1:-** showing nurses that had heard about HAP prevention(n=44).

Findings revealed most 41(93%) of nurses that had heard about prevention of HAP and the least 3(7%) of nurses that had not heard about HAP prevention.

**Table 2:-** showing knowledge on causes, risk procedures, use of catheters and ETT, early signs of HAP, Patients that needs isolation, safe positioning and nurses responsible for HAP prevention (n=41).

Character	Variable	Frequency (n)	Percentage (%)
Possible HAP causes	Bacterial	25	61
	Overstaying in hospital	6	14.6
	Low immunity	10	24.4
Suctioning catheters for very sick should be single use to prevent HAP	Yes	13	31.7
	No	18	44
	Not sure	10	24.3
Risky procedures for developing HAP	Endoscopy	2	4.9
	Endotracheal tubing	19	46.3
	Ventilation	15	36.6
	Major operation	5	12.2
Safer positions for nursing very sick patients against developing HAP	Lateral	2	4.9
	Propped up position	17	41.5
	Recovery	21	51.2
	Recumbent	1	2.4

Early signs that you need to intervene to prevent HAP	Hoarse voice	4	9.7
	Oral thrush	5	12.2
	Cough	30	73.2
	High grade fever	2	4.9
Care for ETT to prevent HAP	Daily turning	11	26.8
	Daily cleaning	18	44
	Daily changing	12	29.3
Patients that need preventive isolation against HAP	Neonates	14	34.1
	Very elderly	12	29.3
	Very sick	15	36.6
Nurses to care for high risk preventively isolated patients	All nurses	23	56.1
	Only healthy nurses	10	24.3
	Only critical care nurses	8	19.5
Pre-symptomatic treatments for HAP prevention	Immunization	1	2.4
	Prophylaxis antibiotics	28	68.2
	Treatment of warning signs	12	29.3

From table 2 above, this study found most 25(61%) of nurses that knew that HAP is caused by bacteria and the least 6(14.6%) of nurses that knew HAP to be caused by patients' overstaying in the hospital. The study also revealed majority 18(44%) of nurses that did not know that suctioning catheters for very sick patients bare used once to prevent HAP whereas only 10(24.3%) reported that they were not sure about use of suctioning catheters and HAP prevention among very sick patients.

The study findings also revealed near to a half 19(46.3%) of nurses that knew endotracheal tubing as risky procedure for patients to develop HAP whereas only 2(4.9%) of patients knew endoscopy as risk procedure for patients to develop HAP. It was also found that more than a half 21(51.2%) of nurses knew recovery position as safer positions for nursing very sick patients in order to prevent developing HAP and only 1(2.4%) knew that recumbent position was safer patients' nursing position to prevent HAP. More so, study also revealed almost three quarters 30(73.2) of nurses that knew cough as early warning sign for a patient developing HAP and only 2(4.9%) who knew high grade fever as warning sign for patient developing HAP.

The study also found majority 18(44%) of nurses knew daily cleaning as safer ETT use to prevent HAP as well as the least 12(26.8%) of nurses that knew daily turning of ETT to prevent HAP. More than a third 15(36.6%) of nurses knew very sick patients as most risk for developing HAP hence need preventive isolation while a few 12(29.3%) that knew elderly to need preventive isolation for being at highest risk for acquiring HAP.

Findings also showed more than a half 23(56.1%) of nurses who knew that all nurses can care for high risky patients for developing HAP whereas the least 8(18.5%) knew that only critical care trained nurses should care for patients at high risk for developing HAP. Furthermore, it was revealed more than two third 28(68.2%) of nurses knew prophylaxis antibiotics to all high-risk patients for developing as a pre-symptomatic approach to mitigate HAP and the least 1. (2.4%) mentioned immunization against pneumonia.

Ensuring clean environment  
Ensuring exercise and ambulation  
Daily cheking of warning signs  
Proper positioning  
Aseptic techniques

Frequency

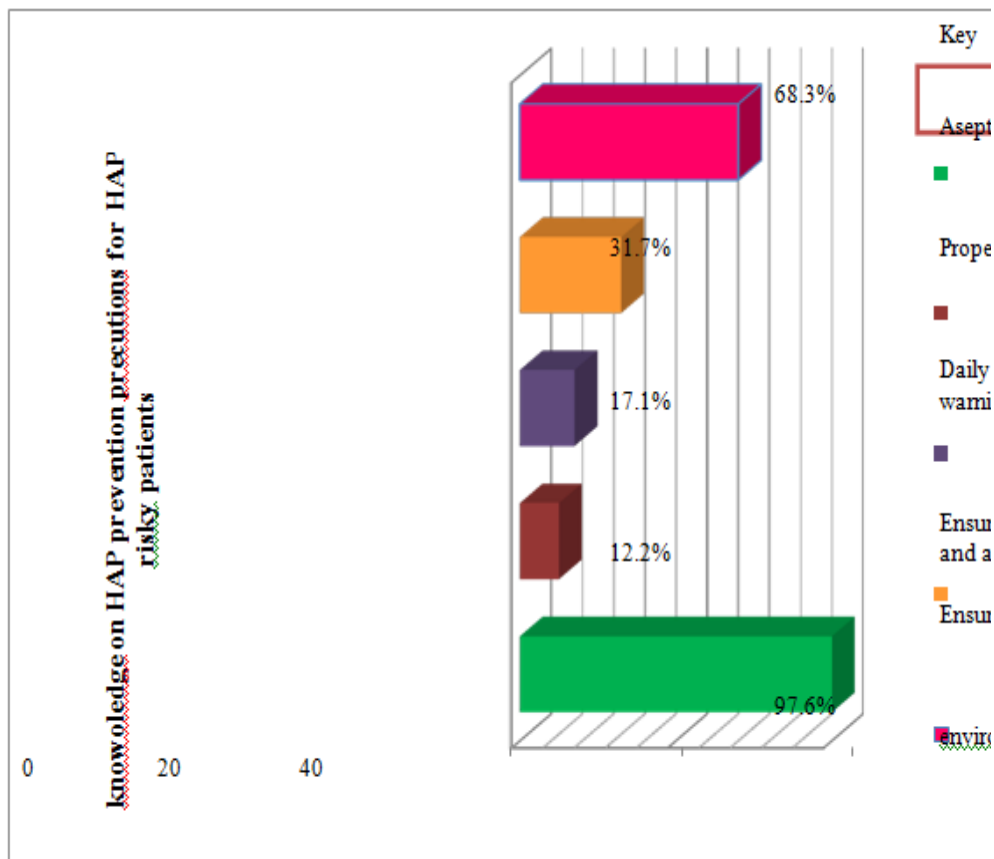
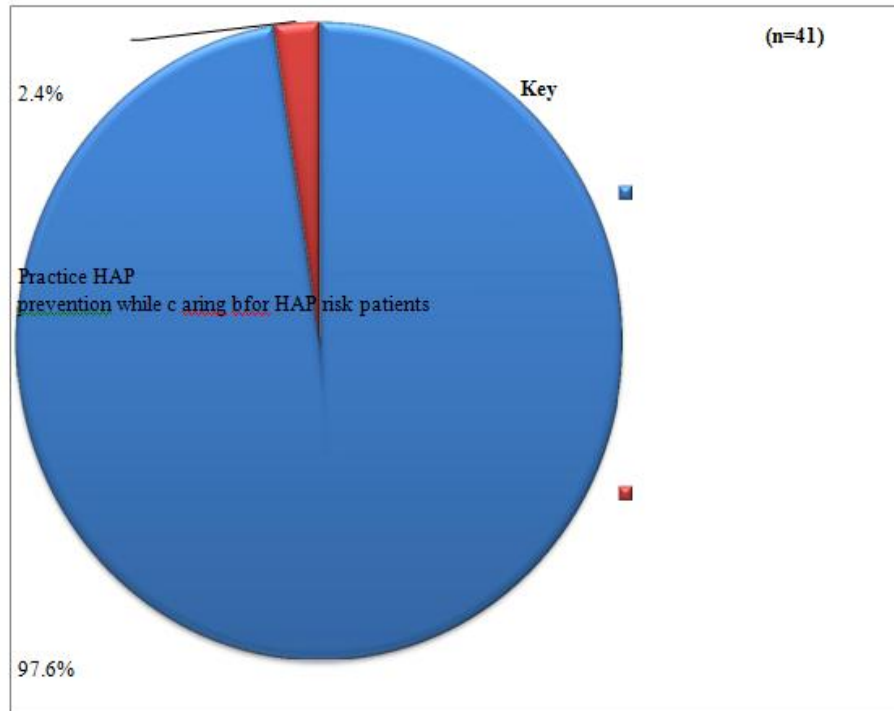


Figure 2:- Showing knowledge on HAP prevention precautions while caring for high risk patient (n=41).

Findings of this research study found almost all 40(97.6%) of nurses that knew aseptic techniques as precautions necessary for HAP prevention and the least 5(12.2%) that knew proper positioning as necessary precautions for HAP prevention.



**Figure 3:-** Showing nurses who practice HAP prevention whole caring for HAP risky patients.

Do not practice HAP prevention while nursing HAP risk patients

Findings revealed most 40(97.6%) of nurses practiced HAP while nursing HAP risky patients and the least 1(2.4%) of patients said that they did not do HAP prevention.

**Table 3:-** showing how nurses did HAP prevention on their patients. (n=40)

A HAP prevention practice		Variable	
		Yes	No
Always hand washed before touching very sick patient	(n)	30	10
	(%)	75	25
Avoided giving proton pump inhibitors to HAP risky patients	(n)	1	39
	(%)	2.5	97.5
Did nasogastric feeding following aseptic technique	(n)	12	28
	(%)	30	70
Sterilized all instruments and supplies used on very sick patients	(n)	35	5
	(%)	87.5	12.5
Do daily oral care using chlorohexidine/saline	(n)	4	36
	(%)	10	90
Did rotational therapy to bed ridden patients	(n)	00	40
	(%)	00	100
Ambulated all post-surgery patients at least once a day and twice other patients unless contra indicated	(n)	4	34
	(%)	10	90
Administer prophylaxis antibiotics for highly risky patients	(n)	37	3
	(%)	92.5	7.5
Put on face mask and other droplets precautions whenever attending to highly risky patients	(n)	38	2
	(%)	95	5

(n)=Frequency

(%)= Percentage

Findings revealed three thirds 30(75%) of nurses always hand washed before touching very sick patient to prevent HAP and only 10(25%) of nurses who did not always hand wash before touching a very sick patients to prevent HAP.

### **Discussion:-**

Findings from table 1 revealed most 21(47.7%) of nurses were aged between 28-37 years and nearly to three quarters 32(72.7%) of nurses were females which could be as result of nursing profession that is generally most dominated by females although this may not have any significant impact on knowledge and practices for preventing HAP.

It was also found out that almost majority 39(88.6%) were certificate nurses. This could be due to the fact that the hospital being one of the certificate nurses training institutions hence recruiting from its products. These could have less knowledge on HAP prevention since at this level; less is discussed regarding pathology of some diseases. These findings agree with those of Goinset al. [13] and Pagani et al. [14] which revealed graduate and post graduate nurses with good knowdge on HAP prevention that their younger counterparts. Furthermore, it was revealed that more than a third 17(38.6%) of nurses had 0-5 years of experience in nursing care. These are likely to have better knowledge and skills in HAP prevention gained through their experience of nursing practice similarly to Lambert et al. [15] whose study revealed nurses with more than 5 years in field of nursing care for critically ill patients to have good knowledge on HAP prevention.

Findings revealed most 41(93%) of nurses had heard about prevention of HAP were majority 25(61%) of nurses that knew that HAP is caused by bacteria. This could be through nursing training and continuous medical educations hence could enable these nurses to do effective HAP prevention. These study findings are similarly to those of Kalyan et al. [16]

The study also revealed majority 18(44%) of nurses did not know that suctioning catheters for very sick patients are supposed to be used once to prevent HAP. This implies that they possibly don't know that very sick patients tend to have low immunity and re-use of same catheters could carry contaminations of micro-organisms leading to HAP. This study findings are contrary to those of Kalyan et al. [16] in India which found 98.15% of nurses who knew that suction catheter for HAP high risky patients should be single used to prevent HAP.

The study findings also revealed near to a half 19(46.3%) of nurses knew endotracheal tubing as risky procedure for patients to develop HAP.

It was also found that more than a half 21(51.2%) of nurses knew recovery position as safer positions for nursing very sick patients in order to prevent developing HAP. This could be associated to knowledge gained during nursing training hence could help to avoid aspiration and other risks that could result into HAP. These results agree with those of Llauradó et al. [17]) in southern Europe intensive care nurses where 81 (75.0%) were familiar with the fact that semi- recumbent position is recommended for HAP prevention unless contraindicated. More so, study also revealed almost three quarters 30(73.2) of nurses knew cough as early warning sign for a patient developing HAP which could be as result of having the symptom being commonly associated with most forms of HAP hence could trigger timely response hence preventing HAP. These findings are similarly to those of Lambert et al. [15] which revealed 43.1% of nurses with knowledge on early sings of HAP like cough.

The study also found majority 18(44%) of nurses that knew daily cleaning as safer ETT use to prevent HAP. Daily cleaning is associated with multiple risks during insertion and removal of ETT hence could increase chances aspiration and HAP than simple ETT safety precautions like daily turning of the tube. These findings disagree with those of Jasson et al., (2013) which found 40.74% of nurses who knew that position of oral endotracheal tube should be rotated 24 hourly to prevent HAP.

More than a third 15(36.6%) of nurses knew very sick patients as most risk for developing HAP hence need preventive isolation which could be from their experiences seeing these develop HAP and it could trigger extra precautions and care to ensure prevention of HAP among patients who are very sick. These findings are similarly to those of Clack et al. [18] across European hospitals which found 89.4% of nurses had knowledge on need to isolate highly susceptible patients from general wards to prevent them from acquiring HAP.



Findings revealed most 40(97.6%) of nurses practiced HAP prevention while nursing HAP risky patients. This could be through knowledge gained about HAP prevention practices and necessity hence could result into effective HAP prevention. These findings agree with those of Kalyan, et al. [16] in India that revealed 94.44% of nurses that practiced preventing HAP.

Findings revealed three thirds 30(75%) of nurses that always hand washed before touching very sick patient to prevent HAP. This could be because hand washing being popularly known as one of most effective tools of reducing hospital infections hence doing this could result into HAP prevention. These findings are similarly to those of Ally [19] in Tanzania by which revealed 86% of nurses that did hand washing before contact with critically ill patients to prevent HAP.

It was also revealed by most 39(97.5%) of nurses never avoided giving their HAP high risk patients PPIs in order to prevent HAPW which could be because nurses did not know dangers associated with administering PPIs to a patient at high risk of HAP hence could bleach HAP prevention since PPIs themselves are risk factor.

The study findings also revealed majority 34(90%) of nurses who reported to have not ambulated all post-surgery patients at least once a day and twice other patients unless contra indicated for HAP prevention. This implies that nurses do not clearly understand benefits of exercises like keeping adequate circulation and maintenance of immunity that are vital for HAP prevention. These findings disagree with those of by Wolfensberger et al. [20] which revealed nurses in USA who ambulated at least once at the day of surgery and at least twice daily in all other patients to prevent non ventilator associated HAP.

### **Conclusion:-**

Nurses had good knowledge on possible cause of HAP being bacterial, other HAP prevention approaches including positioning of very sick patients and patients at high risk of HAP, they also knew early signs of HAP that needs mitigative intervention, prevention by prophylaxis antibiotics and precautions for caring for high-risk patients like aseptic techniques. Poor knowledge was also noted on areas like single using suctioning catheters to prevent HAP, ETT daily rotation and which nurses should care for HAP high risky patients where they did not know that it would have been safer if only healthy nurses cared for very sick and other HAP high risky patients.

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