



## Knowledge, Attitudes and Practices (KAPs) of Nurses About Nosocomial Infection Control in Governmental Hospital at Mukalla City, Hadhramout

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### Abstract

**Background and objectives:** Nosocomial infection (NI) which also called –hospital- acquired or health care associated infection (HCAI) is a serious public health issue affecting hundreds of millions of people every year worldwide. The research including, nursing staff working in governmental hospital in Mukalla city.

**Aim of this Study:** To assess the knowledge, attitude and practices of the nursing staff about Nosocomial Infection Control in Governmental Hospitals, Mukalla city, Yemen.

**Setting:** The carried out in Mukalla city-Yemen. Design: Survey research (cross sectional) design.

**Sample:** Based on a convenience sampling sample of the total numbers of nurses working in the Mukalla governmental hospitals 124 nurses was selected

**Materials and Methods:** The sample of the study consisted of 124 (males and females) nurses working in Mukalla governmental hospitals, Yemem.

**Parts of the Study:** Data collected by using structured self- administered questionnaire consisted of three tools: tool (a): Nurses's knowledge regarding Nosocomial infection control (b): knowledge about attitude toward Nosocomial infection control. Tool (c): knowledge about practice of Nosocomial infection.

**Results:** The study concluded that the overall the majority of nurses (54.3%) in knowledge, (86.5%) in knowledge of attitude and (62.5%) in knowledge of practice at a good level regarding nosocomial infection control and prevention policies procedures and principles.

**Conclusion:** This study found that participants had good knowledge, attitude and practice toward regarding nosocomial infection control.

**Recommendations:** Continuous and repeated training and health education guide on regarding nosocomial infection control. frequent workshops and seminars should be organized in order to provide up-to-date knowledge about nosocomial infection control and means of infection prevention among Mukalla Governmental hospitals.

**Keywords:** Attitude; Knowledge; Practice; Governmental Hospitals; Nurses; Nosocomial Infection Control

## Introduction

Nosocomial infection (NI) which also called –hospital-acquired or health care associated infection (HCAI) is a serious public health issue affecting hundreds of millions of people every year worldwide [1].

NI or (HCAI) appear in a patient under medical care in the hospital or other health care facility which was absent at the time of admission. These infections can occur during healthcare delivery for other diseases and even after the discharge of the patients.

Additionally, they comprise occupational infections among the medical staff [2].

NI an important health problem throughout the world and affects both developed and developing countries, it results in high morbidity and mortality, greater use of antibiotics, prolonged stays in the hospital and consequently increases hospital costs. An effective knowledge about infection prevention can reduce the rate of NI and its consequence [3].

NI affects huge number of patient's globally, elevating mortality rate and financial losses significantly. According to estimate reported of WHO, approximately 15% of all hospitalized patients suffer from these infections [4]. These infections are responsible for 4%-56% of all death causes in neonates, with incidence rate of 75% in South-East Asia and Sub-Saharan Africa [5]. The incidence is high enough in high income countries i.e. between 3.5% and 12% whereas it varies between 5.7% and 19.1% in middle and low income countries. The frequency of overall infections in low income countries is three times higher than in high income countries whereas this incidence is 3–20 times higher in neonates [6]. The rate of (HAIs) In Yemen is up to almost 60%, according to some studies, 80% of infected people are dying because of such infection [7].

IC is a key component of practice for all healthcare professionals, not only for their health but also to reduce NI and thus improve patient safety [8].

Simplest and effective method of NI control is the application of standard precautions for decreasing exposure with infection agents [9]. Standard precautions are including hand hygiene, use of personal protective equipment's, safe injection, health environ-

ment, appropriate solid waste management, respiratory health and etiquette of cough [10].

An assessment of the knowledge, attitude and practice (KAP) of standard precautions by healthcare workers is a prerequisite for initiating and implementing a successful infection prevention and control (IPAC) strategy in any health facility. Many studies have shown that HCW display variable KAP of standard precautions according to their professional group and duration of professional experience, among other factors. Longer duration of professional experience, knowledge and training in standard precautions, and high risk perception have all been associated with improved compliance with standard precautions among health workers [11].

## Materials and Methods

### Design

A descriptive cross-sectional study conducted from 13 November to 31 December 2019.

The study was conducted to give a description of Knowledge, Attitude and Practice of Nurses about Nosocomial Infection Control in Governmental Hospital at Mukalla City, Hadhramout. Carried out by 4th year nursing student, College of Nursing Hadhramout University.

### Study population

This study comprises nursing staff working in governmental hospital in Mukalla city.

### Study area

This study conducted in Mukalla governmental hospitals, the hospitals include: (Ibn Seena Hospital-Universal Hospital and Al-mukalla Hospital for Maternity and Childhood).

### Time of study

The period of study during (November to December) 2019.

### Sampling size and method

The study include 25% from nurse staff working in Mukalla governmental hospital.

The total number of nursing staff working in Mukalla governmental hospital are (489), the sample size (n =124) 25%. The

sampling method that was used in this study is convenience sampling technique.

Hospital	Total number nurses	25%
Ibinseena general hospital	255	56,25=57
Universal hospital	93	23,25=24
Almukalla hospital for maternity and child hood	171	42,75=43
Total number	489	124

**Table 1:** The total number of nursing staff working in Mukalla governmental hospital.

**Validity and reliability**

The reliability using alpha Cronbach ( $\alpha$ ) test was =0.812 and Validity = 0.901.

**Data collection methods and tool**

The data was collected by structured self-administered questionnaire to achieve the purpose of the study, which consists of three tools:

- Tool 1: Part 1: Contain 8 questions regarding the personnel and demographic data.
- Tool 2: Part 1: Contain 8 questions regarding nurse’s knowledge about nosocomial infection control. Part 2: Contain 11 questions regarding nurse’s attitude about nosocomial infection control. Part 3: Contain 12 questions regarding practice of nurses about nosocomial infection control. Part 4: Contain 7 questions regarding main causes preventing nurses from practicing of standard precautions of infection control.
- Tool 3: Part 1: Contain 1 item regarding the source information of nurses about nosocomial infection. We checked all collected questionnaire to ensure that all required questions were answered and completed.

**Ethical consideration**

Ethical reviewing and approval were obtained from Hadhramout University College of nursing to work on this research. The permission was obtained from dean of Nursing Collage, after that the leader of nursing department in the hospital and then the head of the nursing department in each department in hospital. Where information were collected from nurses explaining to them that the

information were saved in strictest confidentiality and would be used for the benefit of society and for scientific purpose.

**Results**

Characteristics	Frequency	Percent
Gender		
Male	55	44.4
Female	69	55.6
Total	124	100.0
Age		
20-30	78	62.9
Education level		
Diploma	79	63.7
BSC	37	29.8
Master	8	6.5
Total	124	100.0
Hospital		
Ibnsina general hospital	57	46.0
Universal hospital	24	19.4
Al-Mukalla Hospital for Maternity and Childhood	43	34.7
Total	124	100.0
Department		
Emergency	25	20.2
Surgical ward	12	9.7
Medical ward	11	8.9
Orthopedic ward	2	1.6
Dialysis department	3	2.4
ICU	24	19.4
Diarrhea	4	3.2
Pediatric ward	23	18.5
Gyn. and Obs	20	16.1
Total	124	100.0
Experience		
Less than 5 years	59	47.6
5-10 years	40	32.3
More than 10 years	25	20.2
Total	124	100.0
Courses in infection control		
Yes	36	29.0
No	88	71.0
Total	124	100.0

**Table 2:** Distribution of study participants according to socio demographic characteristics (n = 124).

Table 2 table indicates that observed frequencies and percents of demographical characteristics variables in the sample which age group more than half of them were between (20-30) years old (62.9%). Majority of nurses are female (55.6%). (45%) of sample was Diploma in educational level. (20.2%) of the selected sample work in an emergency and (19.4%) in ICU. For the year of expe-

rience while (47.6%) of the participating nurses had working experience less than five years. The majority of the nurses (71.0%) had no training courses regarding infection control. The majority of nurses working at Ibn Sina Hospital make up (46.0%) of the total sample.

No	Question	Subject	Frequency	%
1	Nosocomial infection mean is?	An infection that a patient brings from home.	22	17.7
		An infection that the patient acquires from the hospital within 24 hours.	36	29.0
		An infection that the patient acquires from the hospital within 48 hours or more.	66	53.2
2	The most common pathogens that cause Nosocomial infection is?	Bacteria	80	64.5
		Virus	43	34.7
		Fungi	1	0.8
3	The most common system in the human body that is exposed to nosocomial infection is	Respiratory system	115	92.7
		Digestive system	3	2.5
		Urinary system	6	4.8
4	the most department in the hospital that the infection rate increases is	Pediatric	78	62.9
		Intensive care	20	16.1
		Surgical department	26	21.0
5	The phenomenon of hospital infection is considered	Common	80	64.5
		Medium	39	31.5
		Rare	5	4.0
6	Using personal protective equipment when dealing with patients:	It prevents cross infection	26	21.0
		It reduces transmission infection	96	77.4
		It does not reduce the risk of transmission infection	2	1.6
7	Hospital pathogens are distinguished by:	Its ability to resist antibiotics	84	67.7
		Not able to resist antibiotics	21	16.9
		Simple and easy to treat	19	15.3
8	The sources of nosocomial infection transmission are:	Patients and employees inside the hospital	11	8.9
		The surrounding environment	28	22.6

		Patients, employees and the surrounding environment	85	68.5
9	Are the exit of purulent fluids or the appearance of an abscess after about a month in surgeries a sign of nosocomial infection?	Yes	61	49.2
		No	41	33.1
		Don't know	22	17.7
10	The use of antibiotics for hospitalized patients prevents the chance of infection?	Yes	96	77.4
		No	16	12.9
		Don't know	12	9.7

**Table 3:** Knowledge of study participants about nosocomial infection.

Table 3 this table showed the nurses knowledge about nosocomial infection. It was (53.2%) of the studied nurses know the complete correct meaning of nosocomial infection. According to study participants, most common system exposed to NI was respiratory system (92.7%) and say the bacteria are most pathogens that causes NI (64.5%). Regarding the sources of transmission, it was noticed patient, employees and surrounding environment (68.5%).

Pearson Chi-Square			
Variable	Value	Df	Sig
Gender	5.974	8	0.650
Age	32.901	24	0.106
Education level	14.130	16	0.589
Years of experience	26.591	16	0.046
Course of infection control	7.364	8	0.498

**Table 4:** The relationship between the nurse's knowledge and socio-demographic variable.

Table 4 these tables indicate the relationship between the nurse's knowledge and socio-demographic variable. The statistical tests results not a significant difference between nurses knowledge and gender, age, education level and course of infection control (P value = 0.650, 0.106, 0.589, 0.498 respectively), but there is a significant difference between years of experience and knowledge of nurses toward NI (P value = 0.046).

Table 5 regarding attitude about nosocomial infection control. It was (97.6%) of nurses have must adhere to the infection control.

No	Question	Agree		Neutral		Dis-agree	
		N	%	N	%	N	%
1	You must adhere to the infection control policies and procedures at all times.	121	97.6	2	1.6	1	.8
2	Nosocomial infection is transmitted through unsterile needles and sharp objects.	103	83.1	11	8.9	10	8.1
3	Body fluids can be handled with bare hands 89if gloves are not available	18	14.6	17	13.7	89	71.8
4	You do not have to wash your hands if you use gloves	28	22.5	14	11.3	82	66.1
5	Hand washing is an essential means of controlling nosocomial infection.	118	95.2	3	2.4	3	2.4
6	All patients with infectious diseases should be isolated.	117	94.4	6	4.8	1	0.8
7	All patient samples should be treated as contaminated samples.	111	89.5	5	4.0	8	6.4
8	Reducing the number of people at the time of the patient's visit reduces transmission infection.	112	90.3	7	5.6	5	4.0

**Table 5:** Attitude of study participants about nosocomial infection control.

rol policies and procedures at all times. The present study showed, (95.2%) of nurse believe the hand washing is an essential means of controlling NIs. Among the study participant, (81.5%) disagree for use needles exposed to the air for a long time if it does not touch the ground or any contaminated surface. (71.8%) disagree believe dealing with body fluids with bare hands if gloves are not available

Pearson Chi-Square			
Variable	Value	Df	Sig
Gender	19.631	18	0.354
Age	74.188	54	0.036
Education level	35.815	36	0.477
Years of experience	40.154	36	0.291
Course of infection control	16.940	18	0.527

**Table 6:** The relationship between the nurse’s attitude and socio-demographic variable.

Table 6 This table indicates the relationship between the nurse’s attitude and socio- demographic variable. The statistical tests results not a significant difference between nurses attitude and gender, education level, years of experience and course of infection control (P value = 0.354, 0.477, 0.291, 0.527 respectively), but there is a significant difference between age and attitude of nurses toward NI (P value = 0.036).

Table 7 show practice of study participant about nosocomial infection control. It was (59.7%) of nurses always wash their hands before direct contact with the patient and (75.8%) always wash their hands after direct contact with the patient. (30.6%) sometimes change the gloves after every use and every patient. According to study participants, (75.8%) always wear gloves before exposure to blood or body fluids. It was (87.1%) of nurses never wear protective glasses for the eyes to protect them of pollution resulting from the spray blood or any liquid outside the human body.

Table 8 this table indicate the relationship between the nurses practice and socio- demographic variable. The statistical tests results not a significant difference between knowledge and gender, age, years of experience and course of infection control (P value = 0.354, 0.477, 0.291, 0.527 respectively), but there is a significant difference between education level and practice of nurses toward NI (P value = 0.006).

No	Question	Always		Some-times		Rarely	
		N	%	N	%	N	%
1	I wash my hands before direct contact with the patient.	74	59.7	37	29.8	13	10.5
2	I wash my hands after direct contact with the patient	94	75.8	21	16.9	9	7.3
3	I wear sterile gloves before installing the venous catheter.	71	57.3	32	25.8	21	16.9
4	I wear gloves before exposure to blood or body fluids.	102	79.3	14	11.3	8	6.4
5	Change the gloves after every use and every patient.	61	49.2	38	30.6	25	20.1
6	I wash my hands after removing gloves.	82	66.2	29	23.4	13	10.5
7	Adhere to wearing hospital-specific clothing.	102	82.3	18	14.5	4	3.2
8	I cleanse and disinfect the mask before using to patient.	93	75.0	17	13.7	14	11.3
9	I wear protective glasses for the eyes to protect them of pollution resulting from the spray blood or any liquid outside the human body.	7	5.6	9	7.3	108	87.1
10	I wear a mask when dealing with patient chest disease	65	52.4	28	22.6	31	25.0
11	Dispose of the injection immediately and use and put it in a special box.	117	94.4	6	4.8	1	.8
12	Ventilate the ward by opening windows and doors.	66	53.2	34	27.4	24	19.4

**Table 7:** Practice of study participants about nosocomial infection control.

Pearson Chi-Square			
Variable	Value	Df	Sig
Gender	24.011	30	0.772
Age	79.666	90	0.774
Education level	90.686	60	0.006
Years of experience	60.787	60	0.447
Course of infection control	32.630	30	0.339

**Table 8:** The relationship between the nurse’s practice and socio-demographic variable.

Correlation				
		Knowledge	Attitude	Practice
Knowledge	Pearson Correlation	1	.098	-.096-
	Sig. (2-tailed)		.279	.288
	N	124	124	124
Attitude	Pearson Correlation	.098	1	.312**
	Sig. (2-tailed)	.279		.000
	N	124	124	124
Practice	Pearson Correlation	-.096-	.312**	1
	Sig. (2-tailed)	.288	.000	
	N	124	124	124

**Table 9:** Correlation coefficient between knowledge, attitude and practice about nosocomial infection control among studied nurses.

\*\*Correlation is significant at the 0.01 level (2-tailed).

Table 9 correlation coefficient between knowledge, attitude and practice about nosocomial infection control among studied nurses. This figures illustrate that the positive correlation between knowledge and attitude ( $r = 0.098$ ). It was revealed that there was not

statistical significant ( $p = 0.279$ ) and negative correlation between knowledge and practice ( $r = - 0.096-$ ). It was revealed that there was not statistical significant ( $p = 0.288$ ) and positive correlation between attitude and practice ( $r = 0.098$ ). It was revealed that there was a statistical significant ( $p = 0.000$ ) among studied nurses about nosocomial infection control.

No	Question	Agree		Neutral		Disagree	
		N	%	N	%	N	%
1	Lack knowledge of standard precautions to nosocomial infection control	83	67.0	18	14.5	23	18.8
2	Lack of infection control committee in hospital	96	77.4	13	10.5	15	12.1
3	Absence of regular training on the infection control.	105	84.7	9	7.3	10	8.0
4	Personal protective equipment are not available when the need.	85	68.6	23	18.5	16	12.9
5	Affect the burden of work on my ability in the application of guidance prevention to nosocomial infection	99	79.8	13	10.5	12	9.7
6	patient feel uncomfortable when using the personal protective equipment	57	45.9	22	17.7	45	36.3
7	Affect long working hours on my attention practices of the work	91	75.0	12	9.7	19	15.3

**Table 10:** Causes preventing nurses from practicing of standard precautions of infection control.

Table 10 regarding causes preventing nurses from practicing of standard precautions of infection control. The main causes is ab-

sence of regular training on the infection control (84.7%), affect the burden of work on my ability in the application of guidance prevention to NI (79.8%) and lack of infection control committee in hospital (77.4%).

## Discussion

Nosocomial infection is one of the most common problems and difficulties faced by health institutions in developing and developed countries as well. Protecting patients from acquiring NIs is one of the main professional responsibilities for nurses. For this purpose, the present study was conducted.

The finding of present study revealed the age group more than half of them were between (20-30) year old (62.9%), Similar to the study done in Yemen were a major participant (63.3%) age between (20-30) year [26].

Majority of nurses are female (55.6%). Similar study done in Kosovo [27] (82.8%) are female, but different study done in Yemen [26] sex participation the majority in male (64.8%).

In our study majority of study was diploma in educational level (63.7%). Different study done in Iran (89%), also study done in Palestine (55.4%) were majority of participation bachelors in education level [28].

Regarding the nurse's knowledge related to NIs control the majority of the samples (54.3%) have good knowledge toward NIs control. This finding similar with the results obtained from a previous study done in Iran the majority of sample (69.5%) had good knowledge [29].

In our study the reflect that there is no relationship between nurse's gender, age, and their knowledge toward NIs control. Similar to study done in Yemen [26], India [30] and Baghdad [31].

Relative to years of experience there is significant association between nurse's years of experience and their knowledge toward NIs control. This finding disagree with results obtain from other studies done in Baghdad [31] and Iran [29] which indicated that there is no significant association between nurse's years of experience and their knowledge.

In relation to training course, the findings showed that there is no significant association between the nurse's training courses about IC and their knowledge.

Similar study done in Palestine [28]. Regarding the nurse's attitude related to NIs control, the majority of the samples (86.5%) have good attitude toward NIs control. This finding disagree with the results obtained from study done in Iran which revealed (36.5%) of the study participants had good attitude [29].

In our study the reflect that there is no relationship between nurse's education level and their attitude. This finding agree with results obtain from studies done in Kosovo [27] and disagree with result obtain from other study in Iran which indicated that there is a significant between nurse's education level and their attitude [29].

Relative to age there is significant association between nurse's age and their attitude. This finding also different with results obtain from studies done in Iran [29].

Regarding the nurse's practice related to NIs control, the majority of the samples (62.5%) have good practice toward NIs control. This finding disagree with the results obtained from a previous study done in Yemen which revealed (53.9%) of the study participants had poor practice [32].

The results showed that there is not a significant difference between practice and age, gender, education level. Different study done in Palestine is significant between gender and practice [28].

In our study not significant difference between practice with knowledge. The results of the present study was not according to the studies done in Iran [29].

Our study participants reported absence of regular training on the infection control and lack of infection control committee in hospital as the major causes preventing routine practice of standard precautions of infection control in the hospital setting Similar to study done in Nigeria [33].

## Conclusion

The study concluded that the overall the majority of nurses (54.3%) in knowledge, (86.5%) in attitude and (62.5%) in practice at a good level regarding nosocomial infection control and prevention policies procedures and principles. There were significant variation among nurses knowledge and years of experience, nurses attitude and their age, also there were variations among the respondents according to practice and their level of education.

There is positive correlation between knowledge with Attitude and Attitude with practice and negative correlation between knowledge with practice about nosocomial infections control.

### Recommendation

According to the results of the study, recommends to:

- Training course is necessary to increase nurses' knowledge toward nosocomial infection and should be regularly done and updated in view of changing knowledge and practices.
- Provide services programs about infection control and establishment of infection control committee in hospitals and promote supervision on health workers when dealing with patients to protect themselves and patients.
- The administration of nursing at the hospital have to provide cleaning material and sterile, personal protective equipment, vaccination doses, uniforms specific to each department.
- Reduce work overload on health workers through decreasing working hours and number of patients
- In conjunction with the recent rise of pandemics, hospitals should be following latest evidence-based practices of infection control in continuing education/training programs.
- The nursing staff have to protect them self by using personal protective equipment.
- Strict observation of nursing staff during work and continuous evaluation of their practice.

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