

## Infection Control Measures Practiced by Nurses In Obstetric Departments

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### ABSTRACT

**Aim** of this study was to assess the infection control measures practiced by nurses in obstetric departments. **Design:** A descriptive study design was utilized. **Setting:** This study was conducted at obstetric departments (delivery room, antenatal and post natal departments) in Benha university hospital and Benha teaching hospital. **Sample:** **sample size:** all nurses (70 nurses) who were working in the study settings were included in the study. **Sample type:** A convenient sample. **Tools** of data collection include: first tool an interviewing questionnaire sheet: Second tool was an observational check list was used to assess nurses' practices regarding infection control measures. While the third tool was Likert scale to assess nurses' attitude regarding utilizations of infection control measures. **Results:** The majority of nurses had incorrect knowledge regarding infection control measures; also the same finding was observed regarding nurses practiced infection control measures, it was observed that 83% among nurses had a total negative attitude toward infection control concept and principle. Regarding barriers that prevent nurses' practice infection control measures, it was noticed that 71.4% among nurses reported lack of motivation, 60% of them reported the absence of infection control team, while more than half reported inadequate facilities. There were highly significant relation between nurses' incorrect practice and their negative attitude regarding infection control measures, Also, there were highly significant relation between nurses' barriers and their negative attitude regarding infection control measures. **Conclusion:** the majority of nurses had incorrect knowledge regarding infection control measures; these reflect upon their incorrect practices. There were highly significant relation between nurses' incorrect practice and their negative attitude regarding infection control measures **Recommendations:** Established infection control team at Benha University Hospital and Benha teaching hospital to conduct training and monitoring infection control practices by the nurses. In-service and pre-service training programs must be conducted for nurses about National standards of infection prevention measures. Further research study to investigate health team compliance with infection control measures.

### INTRODUCTION

Infection was referred to as multiplication and invasions of pathogens in body tissues which may lead to damage and progress to death through a variety of cellular or toxic mechanism which were often accompanied by fever and an increased number of white blood cells *Abd*

*El-Menem (2007), AbouElela (2008)..*

Nosocomial infections are a worldwide problem. They represent infections acquired during or associated with delivery of care. Hospital-acquired infections are among the leading causes of death and they cause significant morbidity among mothers who receive maternity healthcare. It was concluded *Al-Rawajjah, Hweidi, and*

*Alkhalili (2012)* that maternal mortality due to sepsis was the six leading cause of death among mothers at reproductive age.

In Asia and Africa were reported as hospital-acquired infections are the second reason of maternity deaths *Al-Tawfiq, & Pittet (2013)*. These complications of care require expensive use of healthcare resources and they often lead to increase use of medication and supplies, to more laboratory studies, and to increase duration of hospitalization. They also may impair the quality of life of the patient with hospital-acquired infections even after treatment. Prevention of hospital-acquired infections is therefore cost-effective and achievable even when resources are limited *Carswell, (1989), Dentinger, Pasat, Popa, Hutin, and Mast (2004)*.

Additionally, health setting can provide ideal condition for microorganism to be transmitted between those who give care and because they provide care for a variety of women, the risk for contamination from the pathogenic microorganism is increased through practices of medical sepsis. Universal precautions provide the nurse with techniques for destroying pathogen and preventing contamination to the patient and other people or equipment *Elliott (2009), Elliott&Marriott (2009)*.

Meanwhile, infection control is a quality standard of patient's care and is essential for the well being of the patients and the safety of both patients and staff to accomplish a reduction in infection rates. It was reported also that the infection control measures including hand washing, safe handling of equipment, correct disposal of indwelling devices, utilization of disinfection chemical agents (9). Moreover the basic principles of infection control

involve decontamination, cleaning, disinfection and sterilization. Using personal protective equipment as double gloves, mask, cap and gown and appropriate handling of infected equipment beside avoid splashes of blood or body fluid *Gould, Wilson, and Ream, (2011)*.

Moreover, the nurse can play an important role in control of maternal infection through the following, prenatal assessment that used to identify risk factors for maternal, newborn infection and focused prevention strategies *Hussein, Dileep, and Mavalankar, (2011) Mahonney & Kandil (2004)*. It was also concluded that the obstetric nurse has a vital role regarding practice infection control measures in a unique situation within the hospital, in that while providing postpartum and intrapartum care, she must consider not only the health and wellbeing of the mother- fetus but also the neonate. *John, (2007)*.

#### **Significance of the study:**

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It was estimated that 529,000 mother die during childbirth period. Sepsis was the common causes of maternal deaths; moreover 99% among those deaths occurred in developing countries .While the maternal mortality rate in Egypt due to infection was 8% among women in reproductive age. The obstetric nurse was considering the back bone in practice infection control measures in a unique situation within the hospital. No previous study was conducted to assess infection control measures practiced by nurses in obstetric departments at faculty of nursing Benha University.

**Aim of the study:**

To assess the infection control measures practiced by nurses in obstetric departments.

**Research questions:**

1. What are nurses' knowledge, practice and attitude concerning infection control measures practiced by nurses in obstetric departments?
2. What are the barriers that prevent nurses to practice infection control measures in obstetric departments?

**Subjects and Methods:**

**Research design:**

A descriptive design was used.

**Research setting:**

This study was conducted at obstetric departments (delivery room, antenatal and post natal departments) in Benha university hospital and Benha teaching hospital. The study started from the beginning of April 2011 to 30 December 2012.

**Study subjects:**

**Sample size:**

All nurses (70 nurses) who are working in the study settings were included in the study sample, 30 nurses from obstetric departments in Benha university hospital and 40 nurses from obstetric departments in Benha teaching hospital, the reason for selecting two settings were to increase sample size,

**Sample type:**

A convenient sample.

**Tools of the study:**

**1. An interviewing questionnaire sheet:**

It was included the following parts: *first part* was concerned with assessment nurses' general characteristics, while, the *second part* assessed nurses' Knowledge related to infection control measures in obstetric departments. This part includes 42. Knowledge questions related to infection control measures in obstetric departments, the questions were involved hand washing (5questions), Personal Protective Equipment(PPE) (5questions), Sterilization (10 questions), processing instrument and equipment (7questions), Isolation techniques (4questions), Waste disposal (7questions), Principles of infection control in obstetric departments (4questions). Additionally the *third part* assessed barriers that prevent nurses to practice infection control measures correctly. It was included open ended questions. Assessment of nurses' knowledge was evaluated as correct or incorrect answer.

**2. An observational check list:**

It was designed to assess the infection control measures practiced by nurses. it was comprised 8 procedures as the following, Hand washing (31items), wearing sterile gloves (13 items), wearing sterile gown (8 items), hair cap and masking (11items), following principles of aseptic techniques during vein punctures, Intramuscular injection(19items), Perineal care (17items), avoid needle stick injuries and avoid recapping of needles (11items), correctly practices equipment's processing (45items).

The total items of an observation check list was 155 which were checked by

the researchers on the nurses during their practices of infection control measures and each item was assessed as correct or incorrect practice.

### 3. Attitude Likert scale

It was used to assess nurses' attitude regarding utilization of infection control measures in the obstetric department. It was assessed as agree or disagree and uncertain. This scale consisted of (11 items).

#### Procedure:

The study was conducted from April 2011 to 30 December 2012. After obtaining the administrative permission from the head of the university and teaching hospitals and head of departments, the researchers visited the study settings three days/week, from 9 am to 6pm, 3 times/week. Firstly the researchers reviewed the hospitals registrations book and select the first five nurses who attended to the departments and registered in the hospitals book were included in the study sample. The researchers explained the aim of the study to each nurse to gain her confidence, the researchers obtained written consent from the nurses to agree to participate in the study and each nurse self-administered the interviewed schedule and instructed to answer the questions. The duration of each interview was 15 – 20 minutes. Then the researchers assessed nurse's attitude by using attitude Likert scale which was applied to each nurse.

After completed the interviewing schedule and attitude Likert scale the researchers started to assess nurses 'practices using an observational checklist.

Tools of data collection was sent to three specialized university professors to determine their validity, according to their comments modifications were considered. Pilot testing of the study tools was conducted on 7 nurses, whom were excluded from the study sample the finding of pilot study revealed that the number of questions must be decreased as well as the duration must be decreased from thirty minutes to twenty minutes.

#### Ethical considerations:

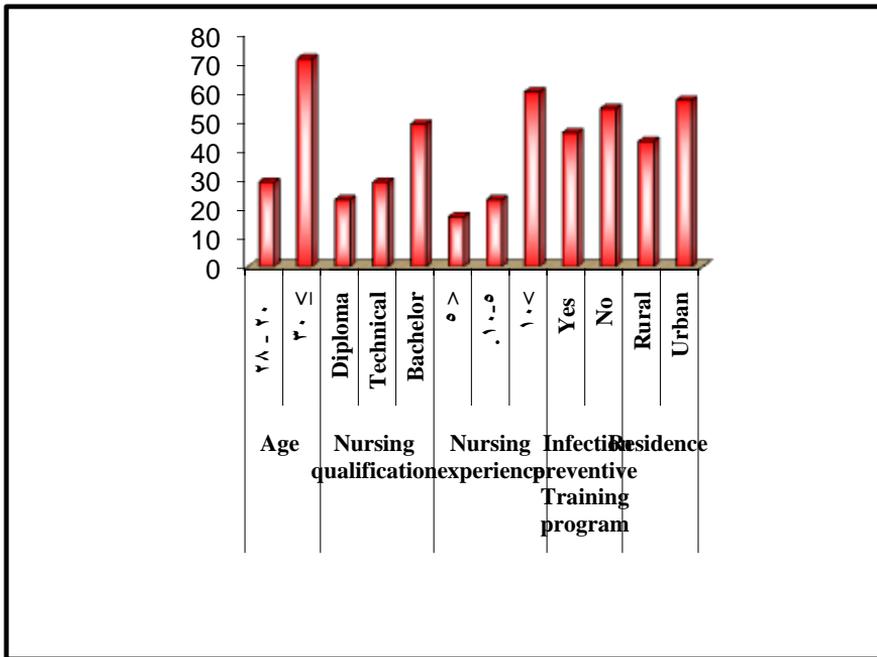
The researchers were explained the aim of this study to all participant nurses before interviewing to gain their confidence .All tools of data collection were burnt after data analysis to assure confidentiality of the data collection. The topic of this study did not touch the ethical, moral, traditional, cultural and religious issues among participants.

#### Statistical analysis:

All data were collected, coded and analyzed using SPSS version (11.0) software; the percentages were used in all tables. The statistical significance of correlation was assessed using r- test. The results were considered significant  $r < 0.05$

**Results**

Figure (1): Distribution of the study sample according to their general characteristics



**Table (1) Distribution of nurses ‘correct and incorrect knowledge regarding infection control measures (n=70)**

Knowledge items	Correct		Incorrect	
	No	%	No	%
<b>Basic infection control knowledge:</b>				
Definition of infection	8	11.4	62	88.6
Signs of infection	8	11.4	62	88.6
Hospital acquired infection due to hospitalization	14	20.0	56	80.0
Health team as a source of infection in delivery room	12	17.1	58	82.9
Infection can be controlled through infection control measures	8	11.4	62	88.6
<b>Basic infection control principles:</b>				
Hand washing	18	25.7	52	74.3
Wearing personal protective equipment	22	31.4	48	68.6
Equipment processing	10	14.3	60	85.7
Dealing with sharp instruments	14	20.0	56	80.0
Reporting needle stick injuries	8	11.4	62	88.6
Techniques of waste disposal	20	28.6	50	71.4
Types of cleaning	12	17.1	58	82.9
Disinfection methods and techniques	16	22.9	54	77.1
Methods of Sterilization	14	20.0	56	80.0
Isolation	34	48.6	36	51.4

**Table (2): Distribution of nurses ‘correct and incorrect practices regarding infection control measures (n=70)**

Practices items	Correct		Incorrect	
	No	%	No	%
Hand washing	10	14.3	60	85.7
Wearing personal protective equipment	16	22.9	54	77.1
Equipment processing	14	20.0	56	80.0
Utilize double bagging for soiled article	6	8.6	64	91.4
Avoid sharp needle injuries	12	17.1	58	82.9
Follow disinfection measures	16	22.9	54	77.1
Utilizing sterilization methods	18	25.7	52	74.3

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**Table (3): Distribution of nurses' attitude regarding infection control measures (n=70)**

Attitude items	Agree		disagree		Uncertain	
	No	%	No	%	No	%
Hand washing is not important	8	11.4	18	25.7	44	62.9
Feeling fear when handling infected products	8	11.4	18	25.7	44	62.9
Feeling un comforting when using a mask and gloves	16	22.9	32	45.7	22	31.4
Infection control measures is not important	14	20.0	18	25.7	38	54.3
Feeling upset to follow infection control measures in the case of emergencies	10	14.3	20	28.6	40	57.1
It is not important to be vaccinated against blood borne infection	16	22.9	32	45.7	22	31.4

**Table (4): Distribution of total nurses attitude regarding infection control measures.**

Items	No	%
Positive attitude	12	17.1
Negative attitude	58	82.9

**Table (5): Distribution of barriers that prevent nurses practices infection control measures (n=70)**

Barriers	No	%
Absence of infection control team.	42	60.0
Absence of instructions and monitoring system.	30	42.8
Inadequate facilities	40	57.1
Allergy from latex	20	28.6
Lack of time emergency situation	38	54.3
Lack of motivation	50	71.4

**Table (6): Correlation between nurses' incorrect practice and their attitude regarding infection control**

Nurses Practice	Nurses attitude				Total	r - Test
	Positive n=12		Negative n=58			
	No	%	No	%		
Hand washing	10	16.7	50	83.3	60	0.87**
Wearing personal protective equipment	12	22.2	42	77.8	54	0.75**
Equipment processing	10	17.9	46	82.1	56	0.82**
Utilize double bagging for soiled article	10	15.6	54	84.4	64	0.93**
Avoid sharp needle injuries	12	20.7	46	79.3	58	0.84**
Follow disinfection measures	10	18.5	44	81.5	54	0.78**
Utilizing sterilization methods	8	15.4	44	84.6	52	0.73**

**\*highly significant r< 0.001**

**Table (7): Correlation between nurses' attitude and their self reported barriers that prevent practice of infection control**

Nurses barriers	Nurses attitude				Total	r - Test
	Positive n=12		Negative n=58			
	No	%	No	%		
Absence of infection control health team.	10	23.8	32	76.2	42	0.74**
Absence of instructions and monitoring system.	8	26.7	22	73.3	30	0.77**
Inadequate facilities	10	25.0	30	75.0	40	0.73**
Allergy from latex	6	30.0	14	70.0	20	0.70**
Lack of time emergency situation	10	26.3	28	73.7	38	0.72**
Lack of motivation	12	24.0	38	76.0	50	0.76**

**\*highly significant r< 0.001**

**Results:**

**Figure (1):** It revealed that 71.42% among the studied nurses' aged more than 30 years. More than half of them from urban areas (57.14%), and about half of them have a bachelor degree in nursing (49%). Regarding nurses experiences, there was about two thirds of nurses had more than 10 years experience compared to 17% were less than 5 years experience. It was also observed that more than half of nurses attended infection control training program.

**Table (1):** It clarified that more than 80% of the nurses had incorrect knowledge regarding basic infection control knowledge. Also, more than 80% of the nurses had incorrect knowledge about basic infection control principles such as cleaning 82.9%, equipment processing 85.7%, dealing with sharp instruments and reporting needle stick injuries 80%, 88.6% consecutively, and method of sterilization 80%.

**Table (2):** This table indicated that more than 80% of the studied nurses perform incorrectly the basic infection control procedures such as hand washing 85.7%, equipment processing 80%, Utilize double bagging for soiled article 91.4%, and Avoid sharp needle injuries 82.9%. While 22.9% and 25.7% respectively among nurses correctly practiced disinfection measures and sterilization methods.

**Table (3):** It was observed that, few nurses feel upset when handling with infected products for fear of infection. It also observed that it was difficult in using the principles of controlling infection impossible to follow especially in the case

of emergency, while 57 % of them and also 14 % among them agreed with the belief that exposure to blood and body fluid displays the health team of the infection while 57 % were uncertain. And 57.1% feeling upset to follow infection control measures in the case of emergencies.

**Table (4):** it was observed that, 83% of the nurses had negative attitude toward infection control concept and principles.

**Table (5):** It clarified that, the frequency distribution of barriers that prevent nurses' practice infection control measures in the obstetric departments. This table shows that 71.4% of nurses has lack of motivation, 60% of them reported the absence of infection control team, while 57.1% reported inadequate facilities among the barriers to sound infection control practice.

**Table (6):** It revealed that, there were highly significant relation between nurses' incorrect practice and their negative attitude regarding infection control measures.

**Table (7):** It revealed that, that there were highly significant relation between nurses' barriers and their negative attitude regarding infection control measures.

**Discussion:**

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Infection control measures provide protection for health team and clients from a range of blood-borne pathogens, but their effectiveness relied upon the knowledge of health team and the level of compliance with their use. *Kalata , Kamange , and Muula (2012)*. the aim of the present study was to assess the infection control measures practiced by nurses in the obstetric departments.

This aim was achieved through the present study findings. It was observed that, the majority of nurses had incorrect practices regarding hand washing. This result agreed with *Minor, (2010)* reported that hand hygiene incorrect practiced among nurses and doctors. Also *Maimbolwa, katowa, and amaukwato (2006), Pettit, (2008)*, they reported that, the practice for hand hygiene practice falls despite a fairly high awareness of its importance. Additionally, hand washing technique was inadequate and often not carried out at all after some nursing procedures *Royal College of Nursing: (2012)*. It was emphasized by *Dentinger, Pasat, Popa, Hutin and Mast (2004), Shalby (2009)* that hand washing is the most important infection prevention procedure, which helps to prevent transmission of infection from one person to another.

As regards nurses' practice about personal protective equipment, the present study concluded that most of them were incorrectly utilizing personal protective equipment during practice any procedure. This finding agreed with *Rodowald (19)* who reported that, all nurses had incorrect practices regarding gowning; this may be due to inadequate supplies. These findings were also emphasized by *Shalby(20)* and *Serag(21)*, they mentioned that, the gloves provide effective protective equipment for hand from the micro flora associated with client care. Gloves should be worn when health care providers have contact with any client' secretions or excretions and must wear after each client care contact. (22)

It was observed from the present study findings that, most of nurses had incorrect practice regarding avoiding needle stick injuries, this finding agreed with *Mahoney et al.(12)* they conducted a

survey in Egypt and revealed that, almost 70% of all health care providers had exposed to needle stick injuries. Also, 100 studies from other countries reveal an overall needle stick and sharps injuries rate of 33 per 1000 health care providers. This finding may be due to various causes as lack of training which may lead to increasing the risk for occupational hazards as cross of blood – born pathogen. Although some educational programmes for the prevention of needle stick and sharp injuries have been given to hospital personnel approximately three-quarters of nurses reported still recapping needles after use. (23).

It was observed from the present study findings that most of nurses had incorrect practice proper decontamination, disinfection measures and utilizing sterilization methods. According to *Jain et al. (24)* who reported that the effective decontamination, disinfection and sterilization of instruments are the key elements of infection control. The present study finding agreed with *Yawson and Hess(25)* they revealed that, the majority of nurses had incorrect practice in cleaning the contaminated instruments before sterilization, this may be due to practical problems including administrative and personal related such as stock irregularity, inadequate supplies, and reduction of tactile sensation as mentioned by the nurses in this study, this agreed with the study of *WHO (26&27)* who reported that, the majority of nurses had incorrect practice in cleaning the contaminated instruments before sterilization . The present study findings regarding nurses' incorrect practice directing attention towards immediate in-service training to enhance nurses to correct practice infection control measures.

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The present study finding was significantly answered the research question among nurses knowledge regarding infection control measures. It concluded that, the majority of nurses' knowledge regarding basic infection control measures had incorrectly answers, these findings agreed with Singh (22) who mentioned that the level of knowledge of hand washing, wearing protection clothes, disinfection, sterilization, isolation, and waste disposal were poor among nurses. This is could be due to lack of specific training courses and lectures and they were didn't receive enough knowledge or seminar related to the infection control measures during their academic under graduate level for both bachelor degree and any specialty diploma of nurses. Nurses must utilize their knowledge of infection control measures as a base to practice infection control measures competently; this stressed the importance of monitoring system to follow up nurses practices while providing maternity care.

Regarding knowledge related to basic infection control procedures, It was concluded from the present study that, the majority of nurses had incorrect knowledge, this agreed with Al Yousef (28) who concluded that, the majority of nurses had poor knowledge about principles of infection control measures include hand hygiene, personal protective equipment, handling sharp instruments, staff performance, visitors, environmental hygiene and handling laboratory specimen. This could be indicated that there was lack of knowledge regarding infection control in their nursing school courses. Additionally Singh (22) and Williams & Buckles (23), they recommended that the educational program was effective in promoting participant knowledge of infection control measures.

Concerning nurses' attitude towards infection control measures .The present finding of this study revealed that, the majority of nurses had negative attitude regarding infection control measures in the obstetric departments, this finding agreed with Abd El-Menem (2) who reported that, the majority of nurses had fear feelings when handling any patient with infection. The present study findings also, agreed with Maimbolwa et al., (16) who illustrated that, the attitude of health workers finding towards infection prevention was negative.

The present study revealed that, there were several barriers that prevent nurses for practicing infection prevention measures in obstetric departments. Some of these barriers were absence of infection control team, absence of instructions and monitoring system, inadequate facilities, allergy from latex, lack of time emergency situation and lack of motivation. This agreed with Abd El-Menem (2) who studied assessment of infection control compliance practiced by nurses in labor and delivery unite reported some obstacles that hindered the application and compliance with infection control measures practiced by nurses such as inadequate supplies, absence of the infection control team for guidance and supervision and absence of training session. Also (23&30) stated that, lack of motivation from senior staff can be the cause of incorrect practice. This result was emphasized that obstacles behind the application of infection control measures are the shortage of the availability of equipment and supplies. (29). As well as it was congruent with study observed that the majority of nurses were feeling uncomfortable when wearing the protective equipment e.g. gloves and mask. (30)

A statistical highly significant relation was observed between nurses' incorrect practice and their attitude regarding infection control measures. These findings were emphasized by Barie (31) who reported that the relative is low level of compliance established at the institutions during the observation of routine infection prevention practice was not due to negative attitude. The present study findings agreed with Ghaleb,etal. (32) who concluded that the majority of the nurses did not carry out or perform certain procedures in relation to infection control precautions in health care settings such as use of protective barriers e.g., gloves, mask, apron and correct disposal of needles and sharp instruments Thus, it can be argued that suggested training program is effective in improving nurses' knowledge and practice regarding infection control.

The present study finding had revealed that, the majority of nurses had incorrect knowledge which reflected on their incorrect practices, so this finding stressed on the importance of pre-services and in-services training program to motivate nurses to competent practice correctly infection control measures.

Egypt was a developing country with limited hospital facilities. Meanwhile maternity hospital administrators must direct their attention toward infection control measures as important issue that need support to provide health team with adequate supplies and equipment to enhance their correct practices regarding infection control measures.

### **Conclusion:**

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The present study findings concluded that, the majority of nurses had incorrect knowledge regarding infection control

measures; these reflect upon their practices, while the majority of nurses had incorrect practices regarding infection control measures and the main barriers were absence of infection control health team, inadequate facilities, lack of time emergency situation and lack of motivation. The majority of nurses had negative attitude toward infection control concept and principles. However there were highly significant relation between nurses' incorrect practice and their negative attitude regarding infection control measures. Indeed the study revealed highly significant relation between nurses' barriers and their negative attitude regarding infection control measures

### **Recommendation:**

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Established infection control team at Benha University and Benha teaching Hospitals to conduct training and monitoring system about infection control measures. In-service and pre-service training programs must be conducted for nurses about National standards of infection control measures. Adequate and appropriate equipment and supplies must be available for all nurses to facilitate their practices correctly. Developing infection control policies and procedures related to safe work practice in hospitals.. Further research study to investigate health team compliances regarding infection control measures.

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