

Evaluation of Nurses Practices Concerning Sterile Techniques Critical Care Units in Al-Najaf AL-Ashraff City Hospitals

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Abstract- Background: Acquired hospital infection most of factors responsible for morbidity and mortality ,especially in critical care units , it is one of most dangerous units because they are crowded with patients who are much closer to each other as well as the most frequently penetrating procedures of the skin and mucous membrane beside that the length of patient hospitalization and treatment this increased susceptibility to infection. The study **aims:** to evaluate the nurse's practice for the sterile technique in critical care units concerning hand washing, uniform, gloves, gown, mask, instruments and equipment, Peripheral Venous Catheter, IV fluids and medication, medical waste management and sharp disposal and to find out relationship between the nurses practices and nurses demographic characteristics. **Methodology:** Descriptive study was conducted in the critical care units at Al-Najaf AL-ashraff City Hospitals from 20th October 2015 to 2nd 2016 to evaluated nurses practice concerning sterile technique in this units. Non probability a (purpose) sample was selected in which included (40) nurses who are work in critical care units at al sader and al hakeem hospital. The sample was collected by uses the instrument which consist of two parts. The first part was demographic data for study sample and the second part the observation checklist tool which consist of 9 domains and 55 items. The instrument validity by 21 experts each of them have more than 10 years' experience in specialty, the internal consist reliability determine by crohn Bach correlation which was $r=0.81$. The analyzed of data was conducted through application of descriptive statistics (frequencies, percentages, mean of scores Standard deviation) and inferential statistics (Chi-squared test and t- test analysis).

Results: showed that the nurses practices for sterile domains was 72.5% of nurses do not applied procedures of hands washing , 85% of nurses dressed uniform , 55% of nurses wearing gloves , 82.5% of them do not apply the practices related to wear sterile gown, 95% of them do not wear the mask , 75.5% of them sometimes sterilized medical instruments and devices, 80% of nurses do not use proper method to sterilize instruments used for peripheral venous catheter insertion, 95% do not applied proper sterilized technique to administration of intravenous fluids and medication ,0.75% of nurses do not separated waste and sharp disposal in safety ways. and the overall result of the study domains in application of the sterile technique was 60% sometimes were applied this practices. Also the results of study showed that There were significant relationship between level education and type of critical care units and their nurses practice for sterile technique (p equal or more than 0.05).
Recommendations: The study recommended to establish

special training course and Engaged all critical care nurses in this training course to improve knowledge and practice concerning infection control. And provided tools and medical supplies to the sterilization technique in the Critical Care units.

Index Terms- Evaluation, Nurses Practices, Sterile Techniques, Critical Care Units

I. INTRODUCTION

One of the most challenges is health care-associated infections (HAI), or infections acquired in health care settings this adverse event are most commonly occurs in health care delivery worldwide. Hundreds of millions of patients are affected by (HAI), worldwide each year, resulting in significant mortality and financial losses for health systems (Varshney, et. al., 2014). A breach in infection control practices facilitates transmission of infection from patients to health care workers, other patients and attendants. It is therefore important for all health care workers, patients, their family members, friends and close contacts to adhere to the infection control guidelines strictly. It is also imperative for health care administrators to ensure implementation of the infection control programme in health care facilities (Patel, et al., 2009). The nurse plays an important role in infection control and prevention. Educating patients may decrease their risk of becoming infected or may decrease the sequelae of infection. Using appropriate barrier precautions, observing prudent hand hygiene, and ensuring aseptic care of intravenous (IV) catheters and other invasive equipment also assists in reducing infections (Smeltzer, et al., 2010).

II. METHODOLOGY

Objectives of the study: The study aims to:

1. Evaluate the nurse's practice for the sterile technique in critical care units concerning hand washing, uniform, gloves, gown, mask, instruments and equipment, Peripheral Venous Catheter, IV fluids and medication, medical waste management and sharp disposal.
2. Find out the relationship between the nurses practices and socio -demographic characteristics which as the level of education, year of experiences, and training course.

Study Design: Quantitative design, was carried out in critical care units in Al-Najaf AL-Ashraff City hospitals for period of 20th October 2015 to 2nd May 2016.

Sample of the Study: Non probability sampling was performed . a purposive sample of (40) nurses who work in critical care units (respiratory care units RCU and cardio care units CCU) .

Study Instrument: the checklist was constructed for the purpose of study (observation tool) consisted from 55 items which include two parts.

Part I: Includes nurses demographic characteristics.

Part II: Observation checklist, which consist of 9 domains that includes: (Hand washing, Uniform, Gloves, gown, Mask, Instruments and Equipment, Peripheral Venous Catheter (PVC), Intra venous IV fluids and medication, and Medical waste management and Sharp disposal).

Validity and Reliability: The content validity of the instrument was established through a panel of (21) experts, the reliability of the items were based on the internal consistency of the checklist was assessed by calculating Cronbach s' Alpha which as= 0.81.

Statistical analysis: The statistical data analysis approach by using (SPSS-ver.20) is used in order to analyze and evaluate the data of the study. A **descriptive** statistical data analysis approach used to describe the study variables : Frequencies and Percentages. **Inferential** statistical data analysis approach: used by application of the Chi-square test, this test is used for determining the association between socio-demographic data and nurses practices concerning sterile technique. Testing the significant association. For this study the significant P-value ≤ 0.05 .

III. RESULTS

Table (1): Socio demographic characteristics of the study Sample

Demographic data	Classification	F NO.= 40	%
Age /years	20-29 years	20	50
	30-39years	11	27.5
	40-49years	5	12.5
	50 and over	4	10
Gender	Male	30	75
	Female	10	25
Levels of education	Nursing school graduate	1	2.5
	Nursing secondary school graduate	8	20
	Diploma in nursing	14	35
	Bachelor in nursing	17	42.5
Marital status	Single	12	30
	Married	28	70
Year of Experiences in nursing	1-5 years	14	35
	6-10years	12	30
	11-15 years	6	15
	16-20 years	3	7.5
	21 and more years	5	12.5
Years of experiences in critical care units	1-5 years	28	70
	6-10 years	5	12.5
	11-15 years	4	10
	16-20 years	3	7.5
Training course	Have not	40	100

Table (1) shows that 50% of the study sample at age group (20-29) years old, 75% of them are males, 42.5% college of nursing graduated, 70% of the present study ware married, 35% have 1-5 years of experiences, 70% have 1-5 years of experiences in critical care units, and 100% of nurses have not training course.

Table (2): Distribution of the study sample by their overall for Nurse applying to aseptic techniques

Domains	Classification	Frequency	Percent	M.S	Evaluation
Hand washing	Never	29	72.5	1.4	Never applied
	Some time	11	27.5		
	Always	0	0		
uniform	Never	1	2.5	2.72	Always applied
	Some time	5	12.5		
	Always	34	85		
Gloves	Never	2	5	2.35	Always applied
	Some time	16	40		
	Always	22	55		
gown	Never	33	82.5	1.35	Never applied
	Some time	7	17.5		
	Always	0	0		
Mask	Never	38	95	1.06	Never applied
	Some time	2	5		
	Always	0	0		
Instruments and Equipment	Never	1	2.5	2.14	Sometime applied
	Some time	30	75.5		
	Always	9	22		
Peripheral Venous Catheter (PVC)	Never	32	80	1.4	Never applied
	Some time	8	20		
	Always	0	0		
IV fluids and medication	Never	38	95	1.18	Never applied
	Some time	2	5		
	Always	0	0		
Medical waste management and Sharp disposal	Never	0	0	2.17	Sometime applied
	Some time	30	75		
	Always	10	25		
Total	Never	16	40	1.74	Sometime applied
	Some time	24	60		
	Always	0	0		

No. (40), cut off point (0.66), Not applied=(Never applied)(1-1.66) , sometimes applied = 1-2 time applied= (1.67-2.33) , always= three time applied =(2.34-3)

Table (2) shows that 72.5% of nurses have sometime applied practices concerning hand washing, while 85% of them always applied practices concerning uniform , whereas 55% of nurses always applied practices concerning gloves wearing , where 82.5% of them never applied practices concerning gown wearing, also the study results reveal that 95% of nurses have never applied masking , also 75.5% of them sometime applied practices concerning sterilization of equipment and instrument

,also the result founded that 80%of nurses, never applied practices concerning peripheral venous catheter sterilized, as well as 95% of nurses never applied sterile technique concerning intravenous fluids and medication sterilization, in addition to 75% of them sometime applied practices concerning medical management and sharp disposable, also Majority of the nurses 60% was sometime applied practice's concerning sterile technique in critical care units.

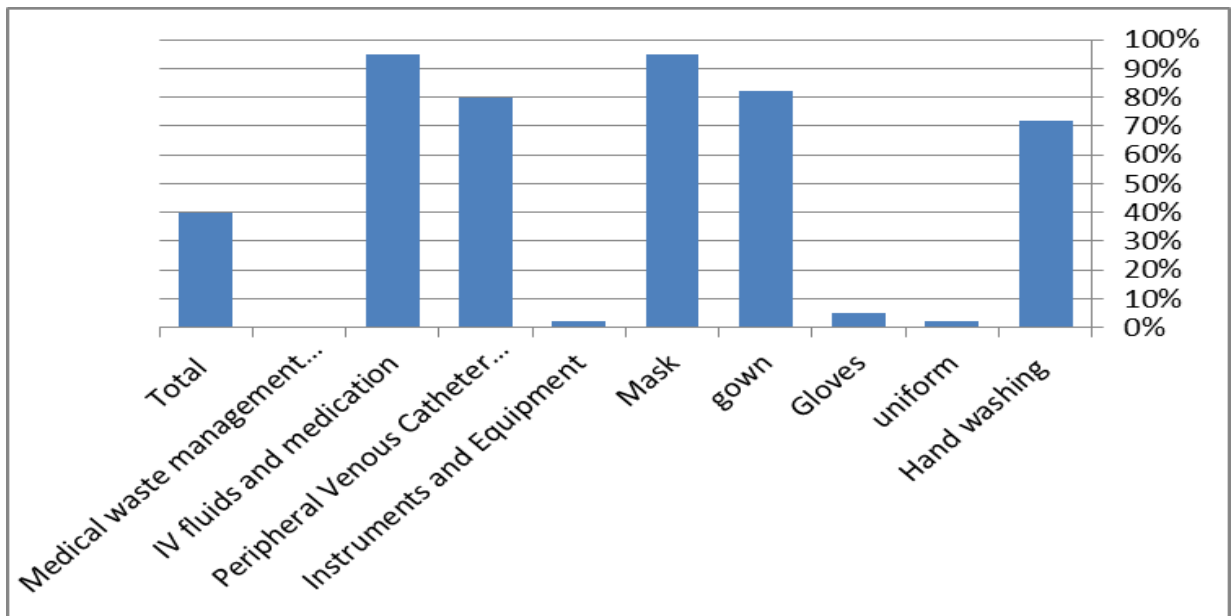


Figure (1): figure shows the nurses not applied for sterilization domains.

Table (3): Statistical Differences between applying of nurses to Aseptic Techniques and their gender

Demographic Data	Rating	N	Mean	Std. Deviation	Std. Error Mean	t-value	df.	p≥0.05
Gender	Male	30	2.5	0.50	0.09	0.537	38	0.595 NS.
	Female	10	2.4	0.51	0.16			

This table shows that there is no statistical difference between the gender of nurses and their applying to aseptic techniques at $P \geq 0.05$ level.

Table (2): Relationship between the nurses applying to Aseptic Techniques and their demographic Characteristics

Demographic data	Classification	Overall evaluation			Chi-square value	d.f	p≥0.05
		Never	Some time	Always			
Age /years	20-29	8	12	0	2.784	3	0.426 NS
	30-39	3	8	0			
	40-49	2	3	0			
	50+	3	1	0			
	Female	4	6	0			
Levels of education	Nursing school graduate	1	0	0	7.612	3	0.055 S.
	Nursing secondary school graduate	2	6	0			
	Diploma	9	5	0			
	Bachelor	4	13	0			
Marital status	Single	6	6	0	0.714	1	0.398
	Married	10	18	0			
Type of Units	CCU	7	18	0	4.000	1	0.046 S.
	RCU	9	6	0			

Years of Experiences	1-5	6	8	0	7.450	4	0.114 NS.
	6-10	5	7	0			
	11-15	0	6	0			
	16-20	1	2	0			
	21 and more	4	1	0			
Years of experiences in critical care units	1-5	9	19	0	2.609	3	0.456 NS.
	6-10	3	2	0			
	11-15	2	2	0			
	16-20	2	1	0			

This table presented that there were significant relationship between the nurses' applying for sterile techniques and level of education, and type of units at $p \geq 0.05$ value.

IV. DISCUSSION

Part I: Discussion of Demographic Characteristic of the Study Sample

The result of present study indicated that 50% of the study sample at age group 20-29 years old, and 75% of them are males, and 42.55 of the study sample graduated from nursing college, also, the study indicated that 70% of study sample was married, 35% of them have 1-5 years of experiences in nursing, while the 70% of study sample have 1-5 years of experiences in critical care units, and 100% of the nurses have not trained course. Present results agree with Jissir and Hassan, (2015) find in their study that the majority of nurses at 20-29 years. Bakey, (2008) evaluate the nurses' practice concerning infection control in Baghdad he finds that the high percent of nurses have 1-5 years of experiences in nursing, and the majority of study sample have 1-5 years of experiences in units, Eskander, et al., (2013) concluded in their study which conducted on 77 nurses to evaluated the nurses knowledge and practice about applying standard Precautions in intensive care units in Egyptian cancer hospital that the level of education for majority of nurses in their study were nursing college, Alice, et al., (2013), they assess the Knowledge and practice of infection control among health workers in a tertiary hospital in Edo state, Nigeria, they found that the majority of nurses are married, Bakey, (2008), also find in his study that most nurses not participation in training course related to infection control. While Ghadmgah, et al., (2011), concluded in their study on which conducted 135 nurses to evaluated the nurses knowledge, attitude and self-efficacy toward infection control in selected hospitals of Mashhad in Iran that the gender for majority of nurses in their study were males.

Part II: Discussion of Nurses Practice Concerning Sterile Technique

The present findings indicate that 72.5% of study sample not Applying the practices of hand washing. present results supported by Abbas, (2008), who evaluated the nurses' practices concerning isolation technique for adult leukemic patient in Baghdad hospitals which conducted on 50 nurses, he found that most of nurses have poor applying to hand hygiene. also the study results agree with Akyol, (2007) in which

concluded in their study on 129 nurses to evaluated the nurses practice concerning hand hygiene among nurses in Turkey, he founded that the majority of nurses have a poor level of practices concerning quality of hand washing. The researcher believed that the present result related to deficit of nurses knowledge about the risk of hand contaminated.

1. Nurses' Practices concerning Wear Uniform

The finding of present study revealed that 85% of nurses was wear the special uniform in critical care units CCU and RCU. These results agree with Khadoura, (2007), who presented that the high percentage of nurses was wearing the special uniform in intensive care units in Palestine.

2. Nurses' Practices concerning wearing Gloves

Regarding the nurses practices for gloving the present study shows that Sometime of nurses was address gloves 55%. this results disagree with Cason, et al., (2007), they evaluate the extent of nurses who working in intensive care units to implement best practices when managing adult patients undergoing mechanical ventilation in united states, They reported that 75% of nurses wearing gloves. The researcher believes that the present result related to not available of sterile gloves, but they can be used clean gloves during nursing intervention.

3. Nurses' Practices concerning Address of Gown

Result of present study indicated that 82.5% of a study sample not address the sterile gown. These results supported by Chan, et al., (2008) they evaluated the knowledge, attitudes and practice patterns on operating room staff towards standard they founded that the nurses have negative attitudes and practices toward standard precaution. These results may be to not availability of sterile gown in hospital.

4. Nurses' Practices for Wear Mask

The result of study revealed that high 95% of study sample not wear the mask. This result agree with Thair and Kadhim, (2012) they evaluated the nurses practices toward infection control in Baghdad hospitals they showed that the majority of nurses not wear the mask. the researcher believed that the

nurses in critical care units feeling discomfort as well as they have lack of knowledge related to important of wear mask.

5. Nurses' Practices concerning Medical Asepsis of 5. Instruments and Equipment in Units

Seventy five point five percent of the study sample were sometime the medical asepsis for instrument and equipment such as dressing sets, Monitors cables, blood pressure cuff monitors, ventilators, infusion pumps, syringe pumps, Laryngoscope, and Breathing tubes, Kandeel and Tantawy, (2012) stated in their study which done in Egypt to evaluated the nurses practice for prevention of ventilator associated pneumonia in ICU which revealed that high percent of nurses were used a sterile technique in preparing the instrument in critical care units.

6. Nurses' Practices Concerning uses Aseptic Techniques during insertion of Peripheral Venous Catheter

The nurses practices regarding the sterile technique for inserted peripheral venous catheter the present study shows 80% of nurses not uses sterile technique for it. This results disagree with, O'Grady, et al., (2011) they emphasized in their study about Guidelines for the Prevention of intravascular catheter-related Infections, that should be adherence to sterile technique during insertion peripheral venous catheter. The researcher believes that the nurses neglect is the main causes for not uses medical asepsis.

7. Nurses' applying for aseptic techniques during administration of IV fluids and medications

The result of present study revealed that 95% of nurses not applied sterile technique during IV fluids and administration of medication. These results disagree with Dolan, et al., (2010), they confirmed in their study that a safe injection, infusion, and medication vial practices in health care were need to adhere sterilization technique during administration of intravenous fluids and medication for patient. These poor practices by nurses leading to more complication for patient.

8. Nurses' practices about Medical Waste Management and Sharp Disposal apply

The study results indicated that 75% of nurses was Sometime applied the medical waste management and safe sharp disposal. The study agree with Ferreira, et al., (2010), they assess the Health care waste management practices and risk perceptions in Algarve region, they founded in their study that a health care worker was inadequate practice and knowledge related to the correct separation of wastes and sharp disposal. the researcher believed that hospital policy responsible about follow up the management of waste.

9. Nurses' Practices concerning applying to Aseptic Techniques in CCU and RCU

The study results indicated that 60% of study sample sometime applied a sterile technique in critical care units. Duerink, et al., (2013), concluded in their study on 1036 nurses to evaluate the nurses knowledge, attitude and behavior about infection control in the island of Java, they founded that 67% of nurses have positive response to the attitude questions about infection control guideline. Also, Ghadmgahi, et al., (2011), stated in their study which done in Iran to evaluated the nurses

practice, knowledge, attitude and self-efficacy about controlling nosocomial, which revealed that 67.9% of nurses had average knowledge about infection control. while Suchitra and Devi, (2007) assessed the knowledge, attitudes and practices on 150 different health care workers about nosocomial infections India, the study shows that 40% of nurses poor practices toward infection control and prevention protocol. also Sadoh, et al., (2006) evaluated the Practices of universal precautions among healthcare workers on 426 health workers, in Ogun state, Nigeria, they concluded that 50% of nurses never applied of universal precaution. the researcher believes, that the results of present study related to lack of nurses knowledge about important of aseptic technique for patient and health care worker safety this due to the shortage of training course and lack of follow by administrators, also may be related to the that the shortage of nurses staff in the RCU and CCU in a study hospitals.

Part III: Discussion of Nurse's applying to Sterile Technique with their socio-demographic characteristics

There were significant relationship between the nurses' applying for a sterile techniques and level of education, and type of units at $p \geq 0.05$ value.

The present finding agree with Duerink, et al., (2013) who assess the knowledge, attitude and behavior of Indonesian health care workers regarding infection control, they find that there were significant relationship between nurses attitude and type of units.

The results of present study agree with Alice and Danny, (2013), who evaluated the Knowledge and practice of infection control among health workers in a tertiary hospital in Nigeria, they founded that there were no statistically significant relationship with gender, duration of employment, or age.

The results of presents study disagree with Ghadmgah, et al., (2011) they evaluate the Knowledge, attitude and self-efficacy of nursing staffs in hospital about infections control they founded that there a significant relationship between knowledge and gender.

Present finding disagree with Kang, et al., (2009) they evaluated hospital nurses' knowledge and compliance on multidrug-resistant organism infection control guideline, in Korea, they founded that there were significant relationship between nursing practice concerning infection control and age and significant between the type of units and nurses practices.

The results agree with Suchitra and Devi (2007), they evaluated the knowledge, attitudes and practices among various categories of health care workers about nosocomial infections they founded that the educational level has a positive impact on retention of knowledge, attitudes and practices in all the categories of health staff.

V. CONCLUSION

The study concludes that the majority of nurses 60% was sometime applied practice's concerning sterile technique in critical care units. Also, there were no significant relationship between nurses practice and nurses demographic characteristic which as include: age, gender, marital status, work place, years of experience in nursing, years of experience in critical care

units and training course and there were significant relationship between level education and type of critical care units and their nurses practice for sterile technique

VI. RECOMMENDATIONS

Based on the study results and conclusion, the study recommended the following:

- 1- Engaged critical care nurses in special training course for improve knowledge and practice concerning infection control.
- 2- Establish infection control center to prepare training course and Follow-up health care provider .
- 3- Activating the principle of reward and punishment for critical care nurses .
- 4- Printed poster fixation on critical care units walls to remembering all health staff about medical asepsis.
- 5- Engage nurse how are have bachelor degree in critical care units.
- 6- Provide equipment and facilities in critical care units .
- 7- Establishing educational programs, for critical care nurses about sterile technique in AL-Najaf AL-Shraff.

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