The instrument that be developed in order to measure the phenomena in this study was by using questionnaire and interview which is consist of three part: First part: The demographic characteristic of the nursing staff. Second part: Concerning knowledge. Third part: Concerning practice. Moreover, the questionnaire validity and reliability were assessed by experts, and a (Cronbach alpha) respectively.

The inferential statistical data analysis approaches were used in order to analyze the data of the study under application of the statistical package (SPSS) ver. (22), and the Microsoft excel (2010).

The study results revealed that more than to third of sample have moderate level of knowledge and practice. Also the results indicated the relationship between nurses level of knowledge and practice toward prevention and control nosocomial infection with workplace and hospital. In addition, the results found a high significant positive correlation between overall nurses knowledge and overall nurses practice regarding prevention and control nosocomial infection.

Based on the findings of the current study, it can be concluded that nurses in hospitals teaching have a moderate level of knowledge and practice regarding prevention and control nosocomial infection.

The findings of this study recommend to encourage the nurses role of model as a better way to apply of control infection.

## 1.1 Introduction

Nosocomial infections are a big problem all over the world, including Iraq. Because it causes illness and death therefore it is conceders a huge burden among patients and workers in health care systems as well as the health care field. Although nosocomial infections occur worldwide and affect all countries, however, healthcare-associated infections can be prevented with relatively inexpensive strategies (1).

Nosocomial or 'healthcare associated infections' (HCAI) occurs in a patient under healthcare in the hospital or other health care facility who was absent at the time of admission. This infection can occur during medical care for other illnesses and even after the patient has been discharged. Additionally, it includes occupational infections among nursing and medical staff (2).

Nosocomial infection is a real and serious threat to both patients and health care workers; nurses are exposed to blood and body fluids, which poses a serious risk to their lives. Accidental exposure to blood-borne viruses, such as hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV), can result in infections(3).

Nosocomial infections pose a significant threat to healthcare systems. A WHO-sponsored prevalence survey of 55 hospitals in 14 countries covering four WHO regions (Europe, Eastern Mediterranean, Southeast Asia, and Western Pacific) found that 8.7% of hospital patients had HAIs. Infectious complications acquired in hospitals affect around 1.4 million people worldwide at any given time (4).



Nosocomial infections caused 5,000 deaths annually at a cost of billions of pounds to the NHS, with patients spending 2.5 times longer in hospital on average, incurring additional costs of $3,000 more than non-patients. That means hundreds of millions of individuals are affected each year by nosocomial infections, which include long hospital stays, disabilities, resistance to treatment, financial hardship, as well as death (5).

Globally, there are studies conducted on the control of hospital-acquired infections. Patient and nurse safety is a critical factor in preventing and controlling infections between the two. Commitment to following traditional and standard procedures in order to reduce and limit the spread of infection as well as reduce transmission of infection. In order to protect nurses, visitors and patients, the causes of illness within health care facilities and the associated risks require robust infection control measures within health care facilities. For this purpose, a wide range of methodologies, procedures, engineering controls, and equipment are available (6).

Nurses are the largest treatment team in hospitals, on the other hand, nurses' knowledge and practice regarding health conditions plays an essential role in ensuring the

health of people and society ultimately, nurses' knowledge and practice positively affects their performance (7).

## 1.2.Objective the study:

1.To Evaluate the level of nurses‘ knowledge about prevention and control of nosocomial infection at Medical Teaching Hospitals

2.To Evaluate the level of nurses‘ practice regarding prevention and control of nosocomial infection

3. To identify the relationship between nurses‘ knowledge and practice regarding prevention and control of nosocomial infection and their demographic characteristics of age, gender, education and training,

4. To identify the relationship between nurses‘ knowledge and practice.



# 2. Methodology

## 2.1 The Study Design

A descriptive design cross –sectional descriptive study was used to evaluate a nurse‘s knowledge and practice nurses relation of nosocomial infection measures. The period of the study is from (10th November ,2021 to 15thJulay ,2022).

## 2.2The Setting of the Study:

The study was conducted in Al-Sadder Teaching Hospital and Al-Furat Teaching Hospital and Al-Zahra Teaching Hospital at the Al-Najaf Al-Ashraf . And data were collected from different area in hospital, Medical wards and Surgical wards from the general.

## 2.3. Sampling of the Study

A non- probability sampling technique (convenient) sample was selected to obtained representative and accurate data. From ( 494 ) nurses working at ICU, ER, Medical wards, Surgical wards, pediatric, neonatal, operational wards , Outpatient , Delivery Room and Maternity wards From ( 200 ) nurses working at Al-Sadder Teaching Hospital and From (152 ) nurses working at Al-Furat Teaching Hospital and From ( 142) nurses working Al-Zahra at Teaching Hospital, ( 50) nurses were excluded from the (nurses for the pilot study, and The nurses working in the administration , Nurses with less than one year experience).the sample size of nurses in each hospital taken into concept.

## 2.4. Data Collection:

The data has been collected through the utilization of the developed questionnaire after the validity and reliability are estimated the data was collected by using the tow technique interview and questionnaire by using the Arabic version of the questionnaire and they are in a similar way, by the same questionnaire for all those subjects who are included in the study sample. The data collection process has been performed from (14th December 2021to 14th March 2022)



## 2.5: Statistical Analysis:

The following statistical data analysis approaches is used in order to analyze the data of the study under application of the statistical package (SPSS) ver. (22), and the Microsoft excel (2010).

## 3. Results:

A total of 494 nurses were included in the study sample ,their demographic data are presented in **table (1),** this table shows that the more than half of the study sample is female (54.3%) with ages ranging between 25-29 years (34.6%). Also, the result in this table above showed that the highest proportion of nurses work in Al-Sadr teaching hospital (40.5%). Moreover, more than half (52%) of them are had academic qualification of diploma degree (44.5%), (50.4%) of nurses have less than 5 years of experience. Finally, the same table

revealed that the more than half of nurses have not participated in training regarding (52.6 %), while (42.7%) have took part in 1-3 training courses.

Regarding **table (2)** , it explains ANOVA table for the association between the overall assessment of nurses' knowledge regarding infections and their demographic data . According to this table, there is a significant relationship ($P<0.05$) between nurses' knowledge and the following demographic variables : hospitals, area of workplace and years of experience.

The post hoc analysis has shown that nurses in Al-Zahra teaching hospital have the lowest mean of scores for nurses' knowledge about prevention and control of nosocomial infection (MS= 0.53) which was significantly different from that obtained in Al-Sadr and Al-Furat hospitals .

Regarding the area of workplace, the highest mean of scores for knowledge about prevention and control of nosocomial infection were seen in nurses working in CCU & RCU (MS= 0.65) which was significantly different from nurses working in the other wards (surgical ward, medical ward, emergency and gynecology) ; while the lowest mean of scores for knowledge about prevention and control of nosocomial infection were seen in nurses working in emergency (MS= 0.52) which was significantly different from nurses working in the other wards (operation room, delivery room, surgical ward, pediatric, CCU & RCU and gynecology).

Concerning the years of experience, the highest mean of scores for knowledge about prevention and control of nosocomial infection were seen in nurses with 5-10 years of experience (MS= 0.61) which was significantly different from other subgroups of nurses.

Regarding **table (3)** , it explains ANOVA table for the association between the overall assessment of nurses' practice regarding infections and their demographic data . According to this table, there is a significant relationship ($P<0.05$) between nurses' practice and the following demographic variables : hospitals, area of workplace .

The post hoc analysis has shown that there is a significant difference ($P <0.05$) between nurses' practice working in Al-Sadr, Al-Furat and Al-Zahra teaching hospitals, recording means of scores : 2.35, 2.22 and 2.17 respectively.

Regarding the area of workplace, the highest mean of scores for practice about prevention and control of nosocomial infection were seen in nurses working in surgical wards (MS= 2.35) which was significantly different from nurses working in the other wards (operation room, delivery room, medical ward, emergency, pediatric ward, and gynecology) ; while the lowest mean of scores for knowledge about prevention and control of nosocomial infection were seen in nurses working in delivery room (MS= 2.15) which was significantly different from nurses working in the all other wards.

Concerning **table (4)** and **figure (1)**, it is about Correlation between nurses' knowledge and practice regarding prevention and control of nosocomial infection . It shows that there is a significant positive correlation the overall nurses' knowledge and practice regarding infection (r= 0.224 ; P value<0.01).

## 4. Discussion of the Study Finding

### 4.1 Discussion of the Association between the overall Nurses knowledge and practice regarding prevention and control of nosocomial infection and their demographic data (Table 2&Table 3).



The results indicate that knowledge is highly significant associated with infection control measure and the area of working place, which recorded a value of (0.000). This value appeared higher in RCU and CCU because this relate to the professional qualification that consider as attribute to the worker of such areas.

The study results show that there is highly significant association between nurses practice on infection control measures and area of workplace at p-value (0.000), and this result explain a strong association with surgical ward. This relate the nurses in the surgical ward are in touch with the patient and always deal with open wounds and always use the standards of aseptic technique in dealing with hospital infections. While providing nursing care, they always expect an infection while dealing with open wounds and also while dressing wounds.

The study results show that there is highly significant association between nurses knowledge and practice on infection control measures and hospital at p-value (0.000). This is

because most of the sample was from Al-Sadr Hospital. This study produced results which corroborate the findings of a great deal of the previous work in this field some important of them are (8,9).

Moreover, the present study results show that there is a significant relationship between nurses knowledge toward prevention and control nosocomial infection and years of experience at p-value (0.05). This study confirms that the more the years of experience are the more information and knowledge. This result is associated with (10,11).

On the other hand, the study results show that there is no significant relationship between nurses knowledge and practice regarding prevention and control nosocomial infection and nurses demographic data in related to (age, gender, level of education, training) and also the nursing practice have no significant association with years of experience variable. The results of present study are supported by other studies that reached same our results (12,13,14).

The study results show that there is a high significant relationship between nurses knowledge and practice toward prevention and control nosocomial infection and hospital. The study result is consistent with the study of (15,16).



## 4.2 Discussion of the Correlation between Nurses knowledge and practice regarding prevention and control of nosocomial infection (Table 4.6).

The study results show that there is significant positive correlation between overall nurses knowledge and overall nurses practice regarding prevention and control nosocomial infection. This is because knowledge improves practice and bridges its gaps. The finding of the current study is consistent with those of (17,18) who are found the same results.

## 5. Conclusion

The following conclusions can be drawn from the present study that most the nurses have moderate knowledge and practice about prevention and control of nosocomial infection. Taken together, these results therefore suggest that nurses should need to use aseptic technique and continuous follow in addition to use standard precaution.

# 6. Recommendations

Encouragement the nurses role as a model is a better way to apply of control infection, The cleaning and sterilization supplies, personal protective equipment, as well as uniforms must be provided by hospital nursing department for each department in hospital

**Table (1) Descriptive statistics (frequency and percentage) for the demographic data of nurses**

| Demographic data | | Frequency (N=494) | Percentage |
|---|---|---|---|
| Gender | Male | 226 | 45.7 |
| | Female | 268 | 54.3 |
| **Total= 494** | | | |
| Age / years | 20-24 | 124 | 25.1 |
| | 25 – 29 | 171 | 34.6 |
| | 30 – 34 | 58 | 11.7 |
| | 35-39 | 54 | 10.9 |
| | 40-44 | 48 | 9.7 |
| | 45-49 | 23 | 4.7 |
| | ≥ 50 | 16 | 3.2 |
| **Total= 494** | | | |
| Hospitals | Al-Sadr | 200 | 40.5 |
| | Al-Furat Al-Awsat | 152 | 30.8 |
| | A-Zahraa | 142 | 28.7 |
| **Total= 494** | | | |
| Area of Workplace | Operation Room | 63 | 12.8 |
| | Delivery Room | 31 | 6.3 |
| | Surgical Ward | 69 | 14.0 |
| | Medical Ward | 35 | 7.1 |
| | Emergency | 109 | 22.1 |
| | Pediatric Ward | 60 | 12.1 |
| | CCU & RCU | 55 | 11.1 |
| | Gynecology | 72 | 14.6 |
| **Total= 494** | | | |
| Level of Education | Secondary school of nursing | 114 | 23.1 |
| | Diploma | 220 | 44.5 |
| | Bachelor | 160 | 32.4 |
| **Total= 494** | | | |
| Years of experience | < 5 | 249 | 50.4 |
| | 5-10 | 115 | 23.3 |
| | 11-15 | 40 | 8.1 |
| | 16-20 | 50 | 10.1 |
| | > 20 | 40 | 8.1 |
| **Total= 494** | | | |
| Training | Yes | 234 | 47.4 |
| | No | 260 | 52.6 |
| **Total= 494** | | | |
| No. of Training | 0 | 260 | 52.6 |

| | | | |
|---|---|---|---|
| Courses | 1-3 | 211 | 42.7 |
| | ≥ 4 | 49 | 9.9 |
| **Total= 494** | | | |

**Table (2) ANOVA table for the Association between the overall Assessment of Nurses' Knowledge Regarding infections and their demographic data**

| Demographic data | Sub-groups | MD | SD | F | P Value |
|---|---|---|---|---|---|
| Gender | Male | 0.57 | 0.15 | 0.64 | 0.42 |
| | Female | 0.58 | 0.16 | | |
| Age / years | 20-24 | 0.59 | 0.14 | 1.7 | 0.12 |
| | 25 – 29 | 0.58 | 0.15 | | |
| | 30 – 34 | 0.56 | 0.18 | | |
| | 35-39 | 0.55 | 0.13 | | |
| | 40-44 | 0.61 | 0.17 | | |
| | 45-49 | 0.51 | 0.16 | | |
| | ≥ 50 | 0.59 | 0.14 | | |
| Hospitals | Al-Sadr | 0.59 **A** | 0.13 | 10.4 | 0.000 |
| | Al-Furat Al-Awsat | 0.60 **A** | 0.13 | | |
| | A-Zahraa | 0.53 **B** | 0.20 | | |
| Area of Workplace | Operation Room | 0.60 **AC** | 0.18 | 4.4 | 0.000 |
| | Delivery Room | 0.59 **AC** | 0.15 | | |
| | Surgical Ward | 0.57 **A** | 0.13 | | |
| | Medical Ward | 0.55 **AB** | 0.16 | | |
| | Emergency | 0.52 **B** | 0.16 | | |
| | Pediatric Ward | 0.60 **AC** | 0.16 | | |
| | CCU & RCU | 0.65 C | 0.12 | | |
| | Gynecology | 0.57 **AB** | 0.14 | | |
| Level of Education | Secondary school of nursing | 0.57 | 0.15 | 0.19 | 0.82 |
| | Diploma | 0.58 | 0.15 | | |
| | Bachelor | 0.57 | 0.16 | | |
| Years of experience | < 5 | 0.57 **A** | 0.15 | 2.34 | 0.05 |
| | 5-10 | 0.61 **B** | 0.16 | | |
| | 11-15 | 0.56 **A** | 0.14 | | |
| | 16-20 | 0.55 **A** | 0.14 | | |
| | > 20 | 0.56 **A** | 0.17 | | |
| Training | Yes | 0.57 | 0.15 | 0.01 | 0.92 |
| | No | 0.58 | 0.16 | | |
| No. of Training Courses | 0 | 0.58 | 0.15 | 1.34 | 0.26 |
| | 1-3 | 0.58 | 0.15 | | |
| | ≥ 4 | 0.54 | 0.17 | | |

**A,B,C : Different letters refer to significant difference at P value <0.05**

**Table (3) ANOVA table for the Association between the overall Assessment of Nurses' practice Regarding Nosocomial infection and their demographic data**

| Demographic data | Sub-groups | MD | SD | F | P Value |
|---|---|---|---|---|---|
| Gender | Male | 2.27 | 0.19 | 1.17 | 0.28 |
| | Female | 2.25 | 0.20 | | |
| Age / years | 20-24 | 2.26 | 0.20 | 0.20 | 0.98 |
| | 25 – 29 | 2.26 | 0.19 | | |
| | 30 – 34 | 2.25 | 0.21 | | |
| | 35-39 | 2.26 | 0.18 | | |
| | 40-44 | 2.27 | 0.19 | | |
| | 45-49 | 2.23 | 0.20 | | |
| | ≥ 50 | 2.23 | 0.22 | | |
| Hospitals | Al-Sadr | 2.35 **A** | 0.18 | 47.53 | 0.000 |
| | Al-Furat Al-Awsat | 2.22 **B** | 0.19 | | |
| | A-Zahraa | 2.17 **C** | 0.17 | | |
| Area of Workplace | Operation Room | 2.23 **A** | 0.13 | 6.05 | 0.000 |
| | Delivery Room | 2.15 **B** | 0.20 | | |
| | Surgical Ward | 2.36 **C** | 0.18 | | |
| | Medical Ward | 2.25 A | 0.17 | | |
| | Emergency | 2.24 A | 0.19 | | |
| | Pediatric Ward | 2.22 **A** | 0.21 | | |
| | CCU & RCU | 2.32 **C** | 0.19 | | |
| | Gynecology | 2.25 A | 0.22 | | |
| Level of Education | Secondary school of nursing | 2.26 | 0.21 | 0.00 | 1.00 |
| | Diploma | 2.26 | 0.20 | | |
| | Bachelor | 2.26 | 0.18 | | |
| Years of experience | < 5 | 2.25 | 0.20 | 1.7 | 0.12 |
| | 5-10 | 2.28 | 0.18 | | |
| | 11-15 | 2.24 | 0.22 | | |
| | 16-20 | 2.23 | 0.20 | | |
| | > 20 | 2.26 | 0.19 | | |
| Training | Yes | 2.25 | 0.19 | 0.09 | 0.76 |
| | No | 2.26 | 0.20 | | |
| No. of Training Courses | 0 | 2.26 | 0.20 | 0.23 | 0.79 |
| | 1-3 | 2.26 | 0.20 | | |
| | ≥ 4 | 2.24 | 0.19 | | |

**A,B,C : Different letters refer to significant difference at P value <0.05**

**Table (4) : Correlation between nurses' knowledge and practice regarding prevention and control of nosocomial infection**

| | Nurses' knowledge |
|---|---|
| Nurses' Practice | r = 0.224 ** |

** High Significant at P <0001

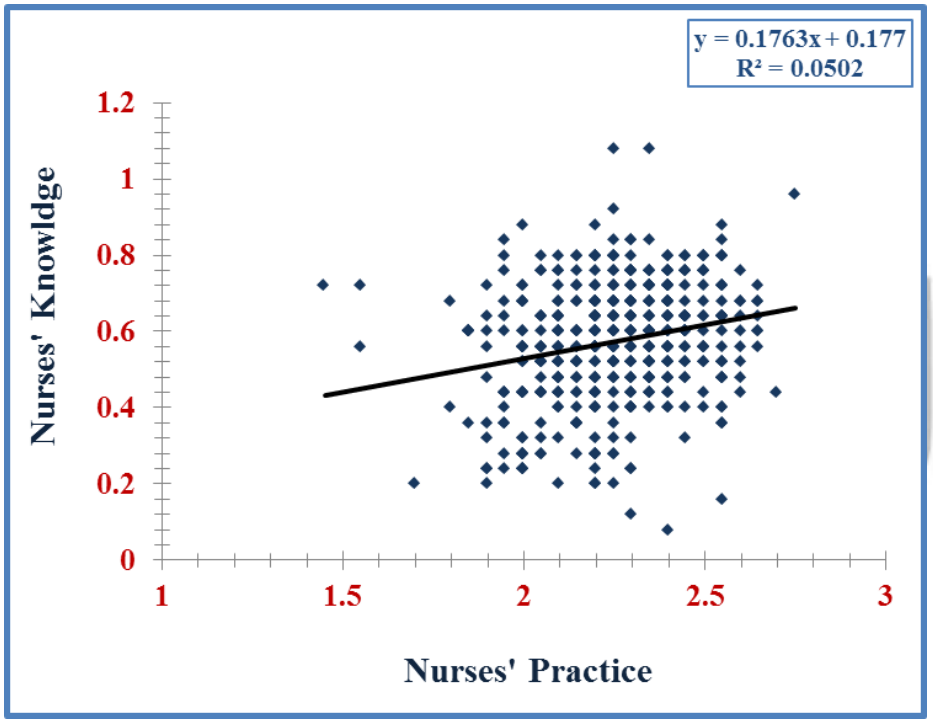


**Figure (1) : Scatter plot and regression line between nurses' knowledge and practice regarding prevention and control of nosocomial infection**

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