

# Effectiveness of an Educational Program on Nurses Knowledge about Nosocomial Infection: Case- Control Study

أثر البرنامج التثقيفي على معارف الممرضين المتعلقة بـخمج المستشفى في مستشفى بغداد  
التعليمي: دراسة الشاهد والحالة

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## الخلاصة:

**الهدف :** تهدف الدراسة الحالية الى معرفة أثر البرنامج التثقيفي المتعلق بمعارف الممرضين حول خمج المستشفى على الممرضين ويجاد العلاقة بين أثر البرنامج مع سنين الخدمة والمستوى التعليمي والدورات التدريبية

**المنهجية :** دراسة شبه تجريبية أجريت في مستشفى بغداد التعليمي ، للفترة من 20 كانون الاول 2013 ولغاية 30 من آب 2014، وتهدف الدراسة الحالية إلى تقييم معارف الممرضين العاملين في الردهات الباطنية حول خمج المستشفيات، وإيجاد أثر البرنامج التعليمي على معارفهم. تكونت عينة الدراسة من (60) ممرض وممرضة والذين يعملون في الوحدات الباطنية لمستشفى بغداد التعليمي وقسمت العينة بشكل متساوي الى مجموعة الدراسة والمجموعة الضابطة.

**أداة الدراسة :** صمم الباحثان البرنامج التعليمي واستمارة الاستبانة للوصول الى أهداف الدراسة وتتألف الاستمارة من جزئين ، حيث شمل الجزء الاول المعلومات الديموغرافية للممرضين، والجزء الثاني شمل تقييم معارف الممرضين المتعلقة بكيفية السيطرة على خمج المستشفيات .

**الوسائل الإحصائية :** تم تحليل البيانات من خلال تطبيق الإحصاء الوصفي (التكرارات، والنسب المئوية، ومتوسط الحساب )، والتحليل الاستدلالي (تحليل التباين ) وتم استخدام البرنامج الإحصائي إصدار 20 لإدخال البيانات لغرض تحليلها.

**النتائج:** أشارت نتائج الدراسة الحالية بأن معظم عينة الدراسة (63.3% ) هم إناث ضمن الفئة العمرية 20-29 سنة وفيما يتعلق بالحالة الاجتماعية فإن أغلب الملاك التمريضي من المتزوجين، وأن الغالبية العظمى لعينة الدراسة هم خريجو معهد التمريض ولديهم من 1-9 سنوات خبرة في التمريض وان أغلب عينة الدراسة شملوا بدورات تدريبية داخل العراق ولكن بعيدة عن موضوع خمج المستشفيات. وبينت الدراسة بأن البرنامج التعليمي على مجموعة الدراسة كان مؤثراً". وأشارت النتائج ايضا بوجود دلالة إحصائية مؤثرة على معارف الممرضين المتعلقة بـخمج المستشفيات قبل وبعد البرنامج التثقيفي لمجموعة الدراسة كذلك بين مجموعة الدراسة والمجموعة الضابطة بمستوى دلالة  $0.05 \leq$

**الاستنتاج :** استنتجت الدراسة بأن البرنامج التثقيفي المعد من قبل الباحثان والمتعلق بـخمج المستشفيات له أثر واضح على معارف الممرضين.

**التوصيات :** توصي الدراسة بتطبيق البرنامج الوطني للسيطرة على خمج المستشفيات في جميع المؤسسات الصحية، والتأكيد على برامج التعليم الطبي المستمر لجميع الملاكات العاملة في المؤسسات الصحية والمتابعة المستمرة لتطبيق البرنامج لمنع إصابة المرضى بـخمج المستشفيات بعد دخولهم الى المستشفى.

## Abstract:

**Objectives:** the present study aims to find out the effectiveness of an educational program concerning the nurse's knowledge about nosocomial infection, and to find out the relationship between effectiveness of program and nurses year of experiences, level of education, and training course

**Methodology:** A quasi-experimental design study was carried out at Baghdad teaching hospital for medical ward, during the period of December, 20<sup>th</sup> 2013 to September, 30<sup>th</sup> of July 2014. The objectives of the present study are to assess the nurses knowledge about nosocomial infection in medical units and to find out the effectiveness of educational program on nurses knowledge. The study samples is composed of (60) nurses who have been actually working in the medical wards in Baghdad Teaching Hospital, those nurses are divided equally into the study and the control groups.

**Instruments:** The researchers constructed the educational program and instruments in order to reach the aims of this study. The questionnaires consist of two parts; first is concerned with the demographic data for nurses; the second part is concerned with the assessment of the nurses' knowledge about nosocomial infection

**Statistical Methods:** The data have been analyzed through the application of: descriptive frequency, percentages; mean of scores; and the inferential analysis that include: Analysis of variance and the researcher used the SPSS version 20 to analysis of data.

**Results:** Most of the nurses 63.3% was females at age 20-29, in relation to marital status most samples was married, and graduated from nursing institute as educational level, 53.3% of nurses have (1-9) years of experience and majority of nurses included with training course in Iraq but not related to nosocomial infection, and the findings of present study revealed that there were statistical differences in nosocomial infection knowledge of nurses between pre and post program and between post study and post control group also there are statistical differences between level of education of nurses and nosocomial infection knowledge at  $P \geq 0.05$ .

**Conclusion:** the present study concluded that the educational program was effective on nurse's knowledge about nosocomial infection

**Recommendation:** The study recommends working to application of national program of nosocomial infection program at all health centers and continuous medical educational program for all staff in the health center, and continuous follow up to applying the program to prevent nosocomial infection after admission patients to hospital

**Key War: Nosocomial Infection, Infection control, Hospital acquire disease:**

## INTRODUCTION

Nosocomial infection also called “hospital acquired infection” can be defined as an infection acquired in hospital by a patient who was admitted for a reason other than that infection. An infection occurring in a patient in a hospital or other health care facility in whom the infection was not present or incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge, and also occupational infections among staff of the facility (1).

Nosocomial infections occur worldwide and affect both developed and resource-poor countries. Infections acquired in health care settings are among the major causes of death and increased morbidity among hospitalized patients. They are a significant burden both for the patient and for public health. A prevalence survey conducted under the auspices of WHO in 55 hospitals of 14 countries representing 4 WHO Regions (Europe, Eastern Mediterranean, South-East Asia and Western Pacific) showed an average of 8.7% of hospital patients had nosocomial infections. At any time, over 1.4 million people worldwide suffer from infectious complications acquired in hospital (2). Existing literature suggests a strong association between poor compliance with the recommended infection control guidelines by health-care personnel and the transmission of pathogens. Transmission frequently occurs during the performance of medical procedures, when the health-care personnel fail to follow aseptic precautions. Poor compliance with recommended guidelines for controlling the spread of infections by healthcare workers expose the patients to an over abundance of pathogens (3). Infection control addresses factors related to the spread of infections within the health-care setting (whether patient-to-patient, from patients to staff and from staff to patients, or among-staff), including prevention (via hand hygiene/hand washing, cleaning/ disinfection/ sterilization, vaccination, surveillance), monitoring/investigation of demonstrated or suspected spread of infection within a particular health-care setting (surveillance and outbreak investigation), and management (interruption of outbreaks). It is on this basis that the common title being adopted within health care is "Infection Prevention & Control (4). The infection control is a key component of practice for all healthcare professionals, not only for their health but also to reduce nosocomial infections and thus improve patient safety (5)

## OBJECTIVES OF THE STUDY:

- 1- Assess the nurse's knowledge about nosocomail infection.
- 2-Construct the educational program about nosocomail infection.
- 3- To find out the effectiveness of educational program on nurses knowledge.
- 4- To find out the relationship between effectiveness of educational program and nurses gender, level of education, year of experiences, and training course

## Ethical Consideration

Hospital acquired infection is a health hazard. It is important to minimize the risk of spread of infection to patients and staff in hospital. Good infection control programs reduce patients' morbidity and mortality, length of hospital stay and cost associated with hospital stay, Infection control( IC) is a quality standard and is essential for the well being and safety of patients, staff and visitors. It affects most departments of the hospital and involves issues of quality, risk management,

clinical governance and health and safety (6 and 7). The infection control is the responsibility of management and all health care workers and is an integral part of the day-to-day quality and safety operations of any hospital. It is the responsibility of all Metropolitan Health Services and hospitals to ensure the development of infection control programs and infrastructure appropriate for the effective prevention, monitoring and control of infection within their facility(8).

## **METHODOLOGY:**

A quasi-experimental design study is carried out through the application of pre-test and post-test approach for the study and control groups, from the period of December, 20<sup>th</sup> 2013 to 30<sup>th</sup> July2014. The present study is carried out in medical ward of the Baghdad Teaching Hospital in Baghdad.

A purposive (Non probability) sample of (60) nurses are selected. The sample is divided into two groups; (30) nurses (study group) are exposed to the nursing instructional program and (30) nurses are not exposed to the program, considered as the control group.

To evaluate the effectiveness of instructional program, the researcher was constructed the instrument, which consists of three parts:

**Part I:** The demographic data which included the nurses' characteristic, such as age, gender, level of education, years of experience, training course and related training course.

**Part II:** is concerned the assessment of the nurses' knowledge after program, which composed of (9) question, The questions are scored as correct question (agree); 3 points, the uncertain question (I uncertain) ; 2 point, and the incorrect question(don't agree) ; 1 point

The content validity of the educational program and the study instruments (the knowledge test), are established through a panel of (15) experts.

Reliability of the Knowledge items has been obtained through application of Cronbach s' Coefficient alpha which as = 0.89

**Statistical Methods:** The data analyzed through the use of Statistical Package for Social Science (SPSS version 20 application). Descriptive Data Analysis (Frequencies, Percentages, Mean of Scores) and Inferential Statistical (Analysis of Variance) was used to analyze the results of present study.

## **RESULTS:**

**Table 1: Distribution of the Study Sample (case and control groups) by Socio-demographic Characteristics**

| Variables               | Classification              | Case group |             | Control group |             |
|-------------------------|-----------------------------|------------|-------------|---------------|-------------|
| Hospital Unite          |                             | f          | %           | f             | %           |
|                         | Medical ward                | 18         | <b>60</b>   | 18            | <b>60</b>   |
|                         | Blood disease               | 6          | 20          | 6             | 20          |
|                         | Psychological ward          | 3          | 10          | 3             | 10          |
|                         | Neurological ward           | 3          | 10          | 3             | 10          |
| Gender                  | male                        | 13         | 43.3        | 11            | 36.6        |
|                         | female                      | 17         | <b>56.6</b> | 19            | <b>63.3</b> |
| Age                     | 20-29 years                 | 13         | <b>43.3</b> | 15            | <b>50</b>   |
|                         | 30-39 years                 | 8          | 26.6        | 9             | 30          |
|                         | 40-49 years                 | 5          | 16.6        | 4             | 13.3        |
|                         | 50-59 years                 | 3          | 10          | 2             | 6.6         |
|                         | >60 years                   | 1          | 3.3         |               |             |
| Level of education      | intermediate nursing school | 4          | 13.4        | 2             | 6.6         |
|                         | secondary nursing school    | 8          | 26.6        | 2             | 6.6         |
|                         | nursing institute           | 10         | <b>33.3</b> | 21            | <b>70.0</b> |
|                         | nursing collage             | 7          | 23.4        | 4             | 13.4        |
|                         | high nursing education      | 1          | 3.3         | 1             | 3.4         |
| Year of experiences     | 1-9 years                   | 16         | <b>53.3</b> | 16            | <b>53.3</b> |
|                         | 10-19 years                 | 8          | 26.6        | 8             | 26.6        |
|                         | 20-29 years                 | 4          | 13.3        | 4             | 13.3        |
|                         | >40 years                   | 3          | 10          | 1             | 3.3         |
| Training course         | In Iraq                     | 26         | <b>86.6</b> | 28            | <b>93.3</b> |
|                         | Out the Iraq                | 2          | 6.6         | 1             | 3.3         |
|                         | Without course              | 2          | 6.6         | 1             | 3.3         |
| Training related course | related                     | 9          | 30          | 9             | 30          |
|                         | unrelated                   | 21         | <b>70</b>   | 21            | <b>70</b>   |

Table 1 presented the demographic characteristics of the study sample were 60% of nurses from the medical wards, 56.6% of them was females, 43.3% of them at age 20-29 years old, 33.3% was graduated from nursing institute, 53.3% of them have 1-9 year of experiences, 86.6% of nurses their training course in Iraq was unrelated to nosocomail infection, and the demographic characteristics of the control group was 60% of them from the medical wards, 63.3% was females, 50% of them at age 20-29 years old, 70% of them graduated from nursing institute, 53.3% have 1-9 year of experiences, and 93.3% have training course in Iraq was unrelated to nosocomail infection.

**Table2: Nursing Response of the Study Group ( pre and post) Knowledge Concerning Nosocomial Infection.**

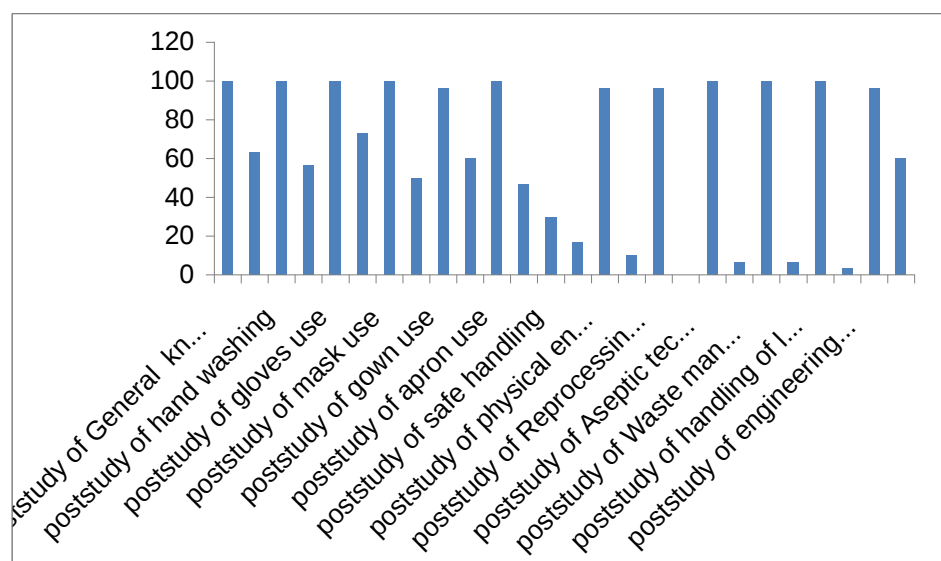
| <b>General nosocomial infection knowledge</b> |                                                                                                                                                 |                       |             |             |                        |            |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------|-------------|------------------------|------------|
|                                               | <b>Items</b>                                                                                                                                    | <b>Pre case study</b> |             |             | <b>Post case study</b> |            |
| 1                                             | A nosocomial, or hospital-acquired, infection is a new infection that develops in a patient during hospitalization                              | response              | F           | %           | F                      | %          |
|                                               |                                                                                                                                                 | I know                | 24          | 80          | 30                     | <b>100</b> |
|                                               |                                                                                                                                                 | I don't know          | 6           | <b>20</b>   |                        |            |
|                                               | <b>mean</b>                                                                                                                                     | <b>1.20</b>           |             |             | <b>1.00</b>            |            |
| 2                                             | A nosocomial is identified at least forty-eight to seventy-two hours following admission                                                        | I know                | 13          | 43.3        | 27                     | 90         |
|                                               |                                                                                                                                                 | I don't know          | 17          | <b>56.6</b> | 3                      | <b>10</b>  |
|                                               |                                                                                                                                                 | <b>mean</b>           | <b>1.60</b> |             | <b>1.10</b>            |            |
| 3                                             | hospital infections are infections that are not present in the patient at the time of admission to hospital                                     | I know                | 17          | 56.6        | 27                     | 90         |
|                                               |                                                                                                                                                 | I don't know          | 13          | <b>43.3</b> | 3                      | <b>10</b>  |
|                                               |                                                                                                                                                 | <b>mean</b>           | <b>1.53</b> |             | <b>1.10</b>            |            |
| 4                                             | There are two forms of nosocomial : Endogenous infection and Exogenous cross-contamination                                                      | I know                | 23          | 76.6        | 28                     | 93.3       |
|                                               |                                                                                                                                                 | I don't know          | 7           | <b>23.3</b> | 2                      | <b>6.6</b> |
|                                               |                                                                                                                                                 | <b>mean</b>           | <b>1.23</b> |             | <b>1.07</b>            |            |
| 5                                             | Endogenous infection, self-infection, or auto-infection. The causative agent of the infection is present in the patient                         | I know                | 23          | 76.6        | 30                     | 100        |
|                                               |                                                                                                                                                 | I don't know          | 7           | <b>23.3</b> |                        |            |
|                                               |                                                                                                                                                 | <b>mean</b>           | <b>1.23</b> |             | <b>1.00</b>            |            |
| 6                                             | Development of nosocomial during hospitalization from physical, psychological and social changes of patient                                     | I know                | 19          | 63.33       | 27                     | 90         |
|                                               |                                                                                                                                                 | Uncertain             | 11          | 36.6        | 3                      | 10         |
|                                               |                                                                                                                                                 | I don't know          |             | <b>6.6</b>  |                        |            |
|                                               | <b>mean</b>                                                                                                                                     | <b>1.43</b>           |             |             | <b>1.10</b>            |            |
| 7                                             | Exogenous cross-contamination followed by cross-infection. During the stay in hospital the patient comes into contact with new infective agents | I know                | 22          | 73.33       | 29                     | 96.6       |
|                                               |                                                                                                                                                 | I don't know          | 8           | <b>26.6</b> | 1                      | <b>3.3</b> |
|                                               |                                                                                                                                                 | <b>mean</b>           | <b>1.33</b> |             | <b>1.03</b>            |            |
| 8                                             | Infection may come in contact with instruments, containers, linen etc                                                                           | I know                | 21          | 70          | 29                     | 96.6       |
|                                               |                                                                                                                                                 | I don't know          | 9           | <b>29.9</b> | 1                      | <b>3.3</b> |
|                                               |                                                                                                                                                 | <b>mean</b>           | <b>1.33</b> |             | <b>1.03</b>            |            |
| 9                                             | the hands of health-care workers are the most frequent vehicle of nosocomial infections                                                         | I know                | 13          | 43.3        | 28                     | 93.3       |
|                                               |                                                                                                                                                 | I don't know          | 17          | <b>56.6</b> | 2                      | <b>6.6</b> |
|                                               |                                                                                                                                                 | <b>mean</b>           | <b>1.67</b> |             | <b>1.07</b>            |            |

Table 2 shows the effectiveness of program through the high percent of excellent for the nurse's responses concerning the nosocomail infection knowledge between the pre and post program.

**Table 3: Nursing Response of Post program for (Case and Control Groups) Concerning Nosocomial Infection knowledge**

| General Nosocomial infection knowledge |                                                                                                                                                 |              |    |      |              |      |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----|------|--------------|------|
|                                        | Items                                                                                                                                           | Post case    |    |      | Post control |      |
|                                        |                                                                                                                                                 | response     | F  | %    | F            | %    |
| 1                                      | A nosocomial, or hospital-acquired, infection is a new infection that develops in a patient during hospitalization                              | I know       | 30 | 100  | 25           | 83.3 |
|                                        |                                                                                                                                                 | I don't know |    |      | 5            | 16.6 |
|                                        | mean                                                                                                                                            | 1.00         |    |      | 1.17         |      |
| 2                                      | A nosocomial is identified at least forty-eight to seventy-two hours following admission                                                        | I know       | 27 | 90   | 14           | 46.6 |
|                                        |                                                                                                                                                 | I don't know | 3  | 10   | 16           | 53.3 |
|                                        | mean                                                                                                                                            | 1.10         |    |      | 1.57         |      |
| 3                                      | hospital infections are infections that are not present in the patient at the time of admission to hospital                                     | I know       | 27 | 90   | 23           | 76.6 |
|                                        |                                                                                                                                                 | I don't know | 3  | 10   | 7            | 23.3 |
|                                        | mean                                                                                                                                            | 1.10         |    |      | 1.23         |      |
| 4                                      | There are two forms of nosocomial : Endogenous infection and Exogenous cross-contamination                                                      | I know       | 28 | 93.3 | 24           | 80   |
|                                        |                                                                                                                                                 | I don't know | 2  | 6.6  | 6            | 20   |
|                                        | mean                                                                                                                                            | 1.07         |    |      | 1.20         |      |
| 5                                      | Endogenous infection, self-infection, or auto-infection. The causative agent of the infection is present in the patient                         | I know       | 30 | 100  | 27           | 90   |
|                                        |                                                                                                                                                 | I don't know |    |      | 3            | 10   |
|                                        | mean                                                                                                                                            | 1.00         |    |      | 1.10         |      |
| 6                                      | Development of nosocomial during hospitalization from physical, psychological and social changes of patient                                     | I know       | 27 | 90   | 21           | 70   |
|                                        |                                                                                                                                                 | I don't know | 3  | 10   | 9            | 29.9 |
|                                        | mean                                                                                                                                            | 1.10         |    |      | 1.37         |      |
| 7                                      | Exogenous cross-contamination followed by cross-infection. During the stay in hospital the patient comes into contact with new infective agents | I know       | 29 | 96.6 | 26           | 86.6 |
|                                        |                                                                                                                                                 | I don't know | 1  | 3.3  | 4            | 13.3 |
|                                        | mean                                                                                                                                            | 1.03         |    |      | 1.13         |      |
| 8                                      | Infection may come in contact with instruments, containers, linen etc.                                                                          | I know       | 29 | 96.6 | 26           | 86.6 |
|                                        |                                                                                                                                                 | I don't know | 1  | 3.3  | 4            | 13.3 |
|                                        | mean                                                                                                                                            | 1.03         |    |      | 1.13         |      |
| 9                                      | the hands of health-care workers are the most frequent vehicle of nosocomial infections                                                         | I know       | 28 | 93.3 | 17           | 56.6 |
|                                        |                                                                                                                                                 | I don't know | 2  | 6.6  | 13           | 43.3 |
|                                        | mean                                                                                                                                            | 1.07         |    |      | 1.47         |      |

Table 3 revealed that the majority of nurses responses for the case group at post program were have good knowledge concerning nosocomail infection than the responses of control group.



**Figure 1: Comparison between the Nurses Responses for Post Case group and Control groups concerning the nosocomial infection Items**

Figure 1 shows the differentiated between the nurse's responses for case and control groups concerning nosocomial infection knowledge

**Table 4: Statistical Differences of Case Group between Type of Hospital Units, level of education, year of experiences, and nurses training course and post program of Nosocomial infection knowledge.**

| Domains                                           |                | Sum of Squares | df | Mean Square | F     | Sig. P≥0.05  |
|---------------------------------------------------|----------------|----------------|----|-------------|-------|--------------|
| <b>Nosocomial infection / Hospital unit</b>       | Between Groups | 4.967          | 3  | 1.656       | .633  | .600<br>NS   |
|                                                   | Within Groups  | 68.000         | 26 | 2.615       |       |              |
|                                                   | Total          | 72.967         | 29 |             |       |              |
| <b>Nosocomial infection / Level of Education</b>  | Between Groups | 29.657         | 4  | 7.414       | 4.280 | .009<br>H.S. |
|                                                   | Within Groups  | 43.310         | 25 | 1.732       |       |              |
|                                                   | Total          | 72.967         | 29 |             |       |              |
| <b>Nosocomial infection / Year of Experiences</b> | Between Groups | 16.025         | 3  | 5.342       | 2.439 | .087<br>N.S. |
|                                                   | Within Groups  | 56.941         | 26 | 2.190       |       |              |
|                                                   | Total          | 72.967         | 29 |             |       |              |
| <b>Nosocomial infection / training course</b>     | Between Groups | 4.002          | 2  | 2.001       | .783  | .467         |
|                                                   | Within Groups  | 68.964         | 27 | 2.554       |       | N.S.         |
|                                                   | Total          | 72.967         | 29 |             |       |              |

Table 4 shows that there were no significant differences between hospital units and post program of nosocomial infection knowledge, that there were significant differences between **level of education of Nurses** and post program nosocomial infection knowledge, there were no significant differences between **nurses Experiences** and nosocomial infection knowledge, and there were no significant differences between **nurses training course** and Nosocomial post program infection knowledge at  $P \geq 0.05$  value

## DISCUSSION

The socio-demographic characteristics of the present study (case group) were 60% of nurses from the medical wards, 56.6% of them was females, 43.3% of them at age 20-29 years old, 33.3% was graduated from nursing institute, 53.3% of them have 1-9 year of experiences, 86.6% of nurses their training course in Iraq was unrelated to nosocomial infection, and the demographic characteristics of the control group was 60% of them from the medical wards, 63.3% was females, 50% of them at age 20-29 years old, 70% of them graduated from nursing institute, 53.3% have 1-9 year of experiences, and 93.3% have training course in Iraq was unrelated to nosocomial infection (table1). The present findings agree with (9, 10 and 11) which revealed in their study that more than one-third of the studied health care worker (37.6%) worked in medical and surgical units, and about 20% worked in critical care units, and most of the procedures were observed in the general medical wards (44.6%), (12) stated that (40%) of nurses worked in medical/surgical floors, (26%) in intensive care units, (18%) in pediatric units, and (15%) in operation rooms, the researchers believes that the most infection condition occurs in surgical ward so the most of nursing management needs to sterile techniques. (8) refer that 52.6% of health care worker were females, (13) indicated that Diploma in nursing was found to be basic qualification among most 114(68.7%)

of study participants, and presented that in relation to qualification degree (92.3%) had a nursing school diploma, while the remaining 7.7% had a bachelor degree in nursing<sup>(14)</sup>. The researcher believes that a high percentage of graduates of institute in the current study that the number of graduates by the largest institutes of the graduates of the College of Nursing, as well as due to lack of nursing colleges in Iraq,

The present findings shows the effectiveness of program through the high percent of excellent for the nurses responses concerning the nosocomial infection knowledge between the pre and post program for the case group, and the majority of nurses responses for the case group at post program were have good knowledge concerning nosocomial infection than the responses of control group.<sup>(15)</sup> a study was conducted in all maternal and child health centers (MCH) to assess Knowledge, Attitudes and Practices of Registered Nurses Regarding the Spread of nosocomial infections the sample of study was 248 participants, they shows that (82.4%) were compliant with hand-hygiene guidelines, some nurses have deficit knowledge about procedures regarding disinfection and sterilization of surgical instruments, many respondents (n =337, 95.7%) were knowledgeable about etiology modes of transmission and that(n=338, 96.0%) know the healthcare workers could spread nosocomial infections, and the a large number of respondents 340 ( 96.6%) were fully aware of safety precautions for the disposal of used medical equipment such as needles, syringes and catheters which are often associated with the spread of infections, the researchers believes that the deficit of knowledge for present study about nosocomial disease caused by lack of training course related to nosocomial infection.

Our study presented that there were no significant differences between hospital units and post program of nosocomial infection knowledge, there were significant differences between level of education of nurses and post program nosocomial infection knowledge, there were no significant differences between nurses Experiences and nosocomial infection knowledge, and there were no significant differences between nurses training course and Nosocomial post program infection knowledge at  $P \geq 0.05$  value. <sup>(16)</sup> assess the knowledge, attitudes and practices among the different health care workers (HCWs) about nosocomial infections, they deals 150 HCWs, doctors (n=50), nurses (n=50) they reported that the level of education has a positive impact on knowledge, attitudes and practices in all the categories of staff, and the years of experience in the hospital significantly correlated to increased knowledge, attitudes and practices among the various categories of staff.

## **CONCLUSION:**

- 1-Majority of the study sample (case and control) groups were females from medical wards, and most of the nurses for both groups at age 20-29 years old graduated from nursing institute, and high percent of them have 1-9 year of experiences.
- 2- High percent of the case group have excellent degree at post program about nosocomial infection
- 3- Study presented that there were no significant differences between hospital units, nurses experiences and post program of nosocomial infection knowledge, also there were significant differences between level of education of nurses and post program nosocomial infection at  $P \geq 0.05$  value.

## **RECOMMENDATION**

- 1- The study recommends to application for national program infection control, and continuous medical educational program for all staff is the most important point.
- 2- More programs can be designed and implemented on the other department in hospital.
- 3- Developing tools to assess the effectiveness of interventions

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