

## Nurses' Compliance With Universal Precautions For Infection Control In Health Care Centers In Makkah

Ali Abdullah Alabbas<sup>1</sup>, Issa Amer Al-Otaibi<sup>2</sup>, Mamdouh Ahmad Albishri<sup>3</sup>, Muneer Khalid Alotaibi<sup>4</sup>, Abdullah Ali S Alzahrani<sup>5</sup>, Saleh Abdulaziz Alqawsi<sup>6</sup>, Ahmed Abdan Audhah Alzahrani<sup>7</sup>, Omar Abdullah Alosmani<sup>8</sup>, Abdulrahman Ali Abdullah Alghamdi<sup>9</sup>, Bandar Fahad Surur Alharbi<sup>10</sup>, Abdullah Faleh Shudayyid Alharbi<sup>10</sup>, Rasha Mubarak Alhindi<sup>11</sup>

### Abstract:

**Background:** Health centers acquired infections are a worldwide problem, leading causes of death. Health care personnel are at real risk for exposure to patient's blood and body fluid through providing comprehensive and continuous care and consequential at risk of acquiring blood borne pathogens. **Study Aim** The aim of this study was to measure of the nurse's knowledge and practices to the standard precautions of infection control measures. **Research design:** A quasi-experimental design was used. **Setting** This study was conducted at 5 health centers in Makkah . **Sample** all nurses were working in health centers, the total number were 140. **Two tools** were used for data collection **first tool** was a self – administered questionnaire for collecting data related to socio-demographic characteristics of nurses, work characteristics and nurses knowledge about infection control measures and the second tool was an observational checklist for assessing nurses compliance to universal precautions of infection control measures. **Results** this study found that approximately one third of the nurses had poor knowledge related to infection control measures and more than half of them had unsatisfactory compliance toward infection control measures, It is clear that proportion of nurses with poor knowledge has a higher unsatisfactory compliance. **Conclusion** The study revealed highly statistical relation among study variables of the present study indicated a significant relation between total knowledge, compliance and barriers in pre and post program. **Recommendation** developing the training programs for nurses to strength the knowledge and improves their performance toward infection control, Adequate and appropriate supplies for compliance with infection control should be ensured for all nurses at all time.

**Key words:** Infection control , universal precautions, health centers, nurse

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<sup>1</sup>Epidemiological Monitoring Technician, King Khaled Hospital in Najran, Saudi Arabia.

<sup>2</sup>Epidemiology technician, Western Janadriyah Health Center, Saudi Arabia

<sup>3</sup>Diploma in Public Health, Ghiran health center, Saudi Arabia

<sup>4</sup>Epidemiological-technician, Medical records, Saudi Arabia

<sup>5</sup>Epidemiological-technician Al Sharayie alulya PHC, Saudi Arabia

<sup>6</sup>Epidemiology technician, Al-Qadisiyah Health Center in Unayzah, Saudi Arabia

<sup>7</sup>Public health, Vectors Borne and Zonatic Control, Saudi Arabia

<sup>8</sup>Public Health Specialist, Vectors Borne and Zonatic Control, Saudi Arabia

<sup>9</sup>Epidemiology specialist, Vectors Borne and Zonatic Control, Saudi Arabia

<sup>10</sup>Epidemiology, Afif General Hospital, Saudi Arabia

<sup>11</sup>Health management specialist, Khulais general Hospital, Saudi Arabia

### **Introduction:**

The universal precaution practice applies the basic principles of infection control through hand washing, utilization of appropriate protective barriers such as gloves, mask, gowns and eye wear, and safe handling and disposal of sharps, safe handling and disposal of linen, disposal of waste and disinfection (**Kermode et al., 2017**; El Hakiem et al., 2022).

Infection control nurse as primary caregivers, nurses are quite involved in identifying and preventing infections. Specially, the infection control nurse is fully qualified and registered nurse with additional qualifications in infection control. These nurses tend to concentrate their activities principally around the individual patient, in term of preventing infection and cross infection. In practice, most daily infection control activities are undertaken by infection control nurse (**Branden, 2015**).

The Role of the Infection Control Nurse is to: Identify nosocomial infections, investigate type of infection and participate in training of personnel. The surveillance of hospital infections, participate on outbreak investigation and development of infection control policy and also review for approval of patient care policies relevant to infection control. The nurse ensure compliance with local and national regulations, makes liaison with public health and with other facilities where appropriate as well as provides expert consultative advice, to staff health and other appropriate hospital programs in matters relating to transmission of infections. The infection control nurse can train link nurses. Link nurse's responsibilities are to convey the recommendations of infection control team to the staff of the ward. Other responsibilities are monitoring aseptic techniques, including hand washing and use of isolation; reporting promptly to the attending physicians any evidence of infection in patient; identifying signs of a communicable disease when the physician is not available; and maintaining a safe and adequate supply of relevant ward equipment, drugs and patient care supplies (**Rasslan and Heeg, 2017**).

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

Reducing the risk of healthcare associated infections is now considered to be an integral part of patient safety and quality of care and many health care facilities worldwide have incorporated this as part of their quality improvement program. However, delivery of infection control services in most developing countries is either nonexistent or ineffective.

### **Aim of the study:**

This study aims to evaluate universal precautions for infection control in health care centers in Makkah through:

- Assessing nurse's knowledge and compliance to the standard precautions of infection control measures.
- Evaluate nurse's compliance to ward universal precautions.

### **Research questions:**

- Are there relation between demographic characteristics of nurses and their compliance to infection control?
- Are there relation among availability of structure environment, infection control supplies and nurse compliance to infection control measures?
- Are there relation between nurses' knowledge regarding infection control measure and their compliance?

- What are the barriers to compliance of nurses toward infection control?

Materials and methods:

Design:

A descriptive study was used.

**Setting:**

The study was carried out in 5 health centers in Makkah.

**Sampling:**

A Purposive sample used in this study; all available and working nurses in the 5 selected centers were included in the study. A total of 140 nurses were enrolled in the study.

**Tools for data collection:**

Two tools were used

**First tool:** An interview questionnaire to assess the following parts:

**The first part:** socio demographic data of the nurse such as (age -level of education-marital status etc)

**The second part:** Knowledge assessment of nurses' staff about infection control such as (meaning of infection – mode of transmission - type of sterilization - standard precautions - waste disposal – dealing with blood spots – cleaning of working surface etc).

❖ **Scoring system**

For knowledge using (correct =1, incorrect =0) the total score of knowledge was 39 point. Score of less than 75% was Unsatisfactory and the score equal or more than 75% was Satisfactory.

**The second tool: An observational check list to assess:**

Adherence of staff nurses in health centers to universal precautions which include (hand washing, wearing of protective equipment, method of contamination, re-use of machinery, dealing with the furniture and sheets, environment, dealing with waste).

❖ **Scoring system**

For compliance using (Done =1, Not done =0) the total score of compliance was 53 point. Score of less than 75% was unsatisfactory and the score equal or more than 75% was satisfactory. Standardized environmental structure checklist to be used for comparison with actual environment

❖ **Scoring system**

The tool rated on a two point (Yes =1, No =0), the score of the items were summed-up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into a percent score. Health center was considered suitable for achieving universal precautions if the percent score more than 50% and unsuitable if the percent score less than 50.

**Pilot study:** A pilot study will be conducted for 10% from total sample to assess the clarity, applicability, and time availability of the tools

**Field work: Approval was obtained. Take written consent from every nurse participant to share in the study will be interviewed in the health centers three days per week, from 10 AM to 1 PM.**

**The Intervention (Training Program) A training program about universal precautions will be addressed to nursing staff in the selected health centers. It will include four phases:**

**First: Preparatory phase:**

A review of recent, recurrent, national and international related literature in various aspects of universal precautions for infection control will be done at this phase. Its aim to design the study tools and to be acquainted with various aspects of universal precautions for infection control.

**Second: Assessment phase:**

At the beginning of the assessment phase, the intervention program will include multi factors related to infection and health hazards, these include: environment factors, equipment factors, and other factors by using pretest questionnaire

**Third: Development and implementation phase:**

This phase aims to developing and implementing of the intervention program it will be designed to be practical in nature, addressing knowledge, and practical skills necessary to improve the client condition and outcome. It will be done through sessions (theory and practice) by using the intervention procedure of universal precautions for infection control.

**The objective of the program:**

Improve health and reduce spread of infection through increasing their knowledge's, practices and out come about universal precautions for infection control.

The implementation of program will take 6 sessions (2 theoretical and 4 for practical). The teaching methods will be including interactive lecture, role play, and demonstration. The teaching media will include poster, data show, video, booklet, etc)

**Fourth: Evaluation phase:**

This phase aims to estimating the effect of the training program to improve nurse knowledge and practices related to universal precautions for infection control, a post test similar to pretest that will be administered to the study subjects after completion of the program. Appropriate statistical methods and test will be used for analysis of the results.

**Administrative Considerations:**

First approval should be obtained

Ethical considerations:

Informed consent will be taken from the women to participate in the study after explaining the objectives of the study, it will have not harmful effect on them, the information will be confidential and they can withdraw from the study at any time.

**Statistical design:**

Variables in the questionnaires will identify, a database will be set and data entry will be done using the appropriate software either excel or SPSS. The results will be analyzed using the appropriate statistical methods

**Results**

**Table (1):** illustrates that, mean age of the studied sample was 35 year  $\pm 7.72$ , 28.6% of nurse's were in the age group above 40 years, 82.9% of them haddiploma, 77.2% were married, and 52.1% nurse's their income were not enough.

Items	No	%
<b>Age (years) :-</b>		
< 30-	26	18.6
30 -	44	31.4
35 -	30	21.4
> 40	40	28.6
<b>Mean of age = 35<math>\pm</math> 7.72</b>		
<b>Educational level :-</b>		
Diploma nurse	116	82.9
Technical nursing institute	24	17.1
<b>Marital status :-</b>		
Single	16	11.4
Married	108	77.2
Widowed	7	5.0
Divorced	9	6.4
<b>Monthly income:-</b>		
Not enough	73	52.1
Enough	33	23.6
Enough of save	34	24.3

**Table (2):** illustrates that, 62.1%, 70.7%, 71.4%, 62.1%, 70.0%, 55.0%, 55.0%, 54.3%, of the nurse had a satisfactory knowledge about universal precautions, importance of hand washing, types of hand washing, steps of hand washing, area usually missed by improper hand washing, of protective equipment, dealing with linen, steps of medical waste management, final disposal of liquid medical waste and dealing with blood spots in pre-program improved to 100%, 100%, 97.9%, 97.1%, 100%, 98.6%, 97.9%, 97.9% in post- program. and statistical significances there was difference between pre & post program highly significant (P<0.001).

Items	pre		post		P value
	satisf	ctory	post	satisfactory	
	aNo	%	No	%	>0.001
<b>Hand washing</b>					
Importance	87	62.1	140	100	0.000000
Types	99	70.7	140	100	0.000000
Steps of hand washing	100	71.4	137	97.9	0.000000
Area usually missed by improper hand washing	87	62.1	136	97.1	0.000000
Method of hand washing	88	62.9	139	99.8	0.000000
<b>Protective equipment</b>					
Types	86	61.4	133	95.0	0.000000

Uses	79	56.4	137	97.9	0.000000
When used	76	54.3	138	98.6	0.000000
Dealing with sharp equipment	100	71.4	140	100	0.000000
Dealing with linen	98	70.0	140	100	0.000000
<b>Dealing with waste</b>					
Types of waste	78	55.7	133	95.0	0.000000
Steps of medical waste management	77	55.0	138	98.6	0.000000
Final disposal of solid medical waste	75	53.6	133	95.0	0.000000
Final disposal of liquid medical waste	77	55.0	137	97.9	0.000000
Criteria of safety box	88	62.9	139	99.3	0.000000
Dealing with blood spots	76	54.3	137	97.9	0.000000
Method of cleaning surfaces	78	55.7	136	97.1	0.000000

### Discussion:

Health centers acquired infections are a worldwide problem. They cause significant morbidity and mortality among clients who receive health care. The complications of infections require expensive use of health care resources and they often lead to increased use of medication and supplies. Health care –associated infections affect hundreds of millions of client's worldwide every year (**Elizabeth et al., 2018**).

As regards nurse's socio demographic data, the present study shows that the age of nurses ranged between < 30 - >40 years with the mean age of (35 ± 7.72), the highest percentage of them were between the age of >40 years (Table 1). This finding agreed with **Heffner, (2018)** who found that more than three quarter of nurses their age ranged between 30 up to 35 years. In contrast to this result (**Owen, 2010**) who found that the majority of nurses their age ranged between 40 - < 40 years.

Regards nurses' qualification and marital status, the current study found that the majority of them had nursing diploma and were married (Table 1). These results come in accordance with the studies done by **Nelson, (2018)** they also found that the majority of nurses had nursing diploma and were married. In relation to working condition, the present study revealed that the majority of nurses had an experience ranged between 10 up to 20 years (Table2). These results agreed with the studies done by **Celik, (2016)** that found the majority of nurses had an experience up to 10 years.

The present study finding indicated that the minority of the sample had satisfactory knowledge about universal precautions, importance of hand washing, types of hand washing, steps of hand washing, area usually missed by improper hand washing, of protective equipment, dealing with linen, steps of medical waste management, final disposal of liquid medical waste and dealing with blood spots in pre –program, program improved to majority after taking intervention program, (**table, 2**). This result accordance to **Brown et al. (2018)** mentioned that if nurses lacks in professional knowledge, she should be given appropriate instruction and training . So it is important that the workplace must develop comprehensive continuing program training for nurses working in HC centers.

### Conclusion:

Based on the findings and research questions of the present study, it was concluded that nearly more than one- third of nurses in HC centers in Makkah had moderate total knowledge scored regarding to universal precautions of infection control, while more than half nurses unsatisfactory compliance (performance) towards universal precautions of infection control .

However statistical relation between demographic characteristics of nurses and their compliance to infection control was insignificant, the results found that the 4 centers had unsuitable construction. Also according to the relation between structure environment and nurses compliance to infection control measures was statistical insignificant. Indeed the study revealed statistically the proportion of nurses with poor knowledge had a higher unsatisfactory compliance while the result is almost statistically significant.

### **Recommendations:**

- Training program must be conducted in health centers for all nurses related to infection control about universal precautions, type of blood born diseases, dealing with mask and how to deal with blood and body fluids spillage to avoid the infection to the client and the occupational hazards to the staff.
- Provision of educational booklets for universal precaution as a guide and reference is very important to motivate nurses for continuity of knowledge regarding infection control as well the community social support network.
- Accessibility of the structure as (sterile services department, sinks, laundry, waste collection room) to facilitate application of successful the infection control program.
- Adequate and appropriate supplies for compliance e.g. (gloves, alcohol, paper towel and safety box).
- The staff nurses must be have unity scientific guide book to the health team to avoid the personal activities.
- Documentation- system for occupational exposures as needle–stick and splash exposures should be established.
- Regular staff meeting and conferences must be conducted to discuss work problems and needed resources.
- There must be a complete system overseen by the succession of not applying infection control procedures

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