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# ASSESSINGHEALTH CARE PROVIDER'SKNOWLEDGE ABOUTPERSONAL PROTECTIVE MEASURES

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**Abstract**:

**Background:** Health care providers occupational life is associated with many types of infection. For that, protecting staff and patients from infection is vital.Therefore, all staff who may have to use personal protective equipment PPE must be knowledgeable about all aspects related to PPE use, wearing and removal. **Aim:** The aim of this study is to assess health care providers knowledge about personal protective measures. **Methods:** A cross sectional study design was utilized. One hundred thirty of HCP (54 physicians, 44 nurses, 6 head nurses, 20 technicians, 6 cleaners) were selected from Student University Hospital in Mansoura including; (emergent department, clinics, and laboratories).**Tools:** Two tools were used for data collection: Demographic& occupational self-administered questionnaire including (age, sex, education, years of experience, nature of work), self-administered questionnaire sheet to assess studied HCP knowledge regarding infection control related PPE. **Results:** This study showed poor score level of HCP knowledge regarding PPE in studied setting. **Conclusion:** This study concluded that HCP's knowledge regarding PPE were poor due to lack of adherence to the infection control related universal precautions. **Recommendations**: study recommended continuous education and training program of HCP to improve and update their knowledge.

**Key words:** educational strategies, personal protective equipment, health care provider, occupational hazards.

## Introduction

Personal protective equipment (PPE) is defined as a range of barriers to protect mucous membranes, airways, skin, and clothing from contact with infectious agents. [1, 2] PPE is a clothing or equipment worn by workers for protection against a hazard. [3] The hazard in health care setting is exposure to blood, saliva, or other body fluids or aerosols

that may carry infectious materials such as Hepatitis C, HIV, or other blood borne or body fluids pathogens.[1, 4]Creating a physical barrier between the potential infectious material and the healthcare providers can be occurring by proper use of PPE.[5]In United States, the Occupational Safety and Health Administration (OSHA) requires the use of (PPE) by workers to guard against blood borne pathogens if there is a reasonably anticipated exposure to blood or other potentially infectious materials.[6]

PPE include gloves, gowns, bonnets, shoe covers, face shields, CPR masks, goggles, surgical masks, and respirators.[7]Infection control is a committee concerned with the factors related to the spread of infections within the

health-care setting (whether from patient-to-patient, from patients to staff and from staff to patients, or among-staff).[8]

Healthcare-related infections are infections that accompanied with healthcare activities resulting a major threat for patient safety.[9] Healthcare-associated infections HCAI's can lead to extreme illness, extended hospitalization, long term disability and patient dying. [10]

Infection control is a committee interest with infection controlling and prevention, systems assignment, monitoring, surveillance, reporting, research and education.[11]This Committee represents headquarters and managers who are in decision-making positions from various health care specialties and who will implement infection control training and education.[12]

However, Compliance with personal protective equipment use is closely related with the professionals' perception about the occupational risks they are likely to be exposed. More compliance with PPE use affects professionals and patients safety. [13] A hospital-based outpatient clinic HBOC is a setting in which integrated and accessible primary and specialty health care services are provided by clinicians and nurses. Addressing personal health care needs, developing a sustainable partnership with patients, and practicing in the context of family and community.[14]

Most exposure prone procedures are undertaken at outpatient clinics where personnel are continually at risk of acquiring BBV infection during these (invasive and noninvasive) procedures due to frequent contact with blood, extensive use of sharp instruments, and the intricacy of the procedures with inadequate knowledge about acquiring and preventing infection.[15]

**Aim of the study**

The aim of the study is to assess health care provider's knowledge about personal protective measures in outpatient clinics at Students University Hospital.

**Research Question:**

- What is the healthcare provider's level of knowledge about infection control related personal protective measures in outpatient clinics at Student University Hospital?

**METHODS**

**Research design**

A Cross sectional design was used to accomplish the current study**.**

**Setting**

This study was conducted at outpatient clinics, laboratories and emergent departments at Students University Hospital in Mansoura city.

**Subject and sampling:**

**Subjects**

One hundred and thirty of health care providers (doctors, nurses, technicians and workers) were recruited from the above mentioned setting at different departments. **Sampling technique:** Proportional allocation technique was used to select the required number of health care providers at previous setting by using this equation: Required number = health care providers x 130/ 232 (Actual number of health care providers)**.**

**Tools**

After reviewing the relevant literature, two tools were developed by the researcher for data collection in this study.

***Tool I: Self-administered questionnaire to assess demographic &qualification data, this tool was composed of two parts***

Demographic data; include (age, sex, and education)Occupational data; include (years of experience, nature of work, availability of personal protective equipment).

***Tool II: Self-administered questionnaire*** to assess health care provider's knowledge about infection control related personal protective measures.The knowledge level was consisted of three categories:-

Poor< 50% of total scores (<30)

Fair = 50% to 75% of total sores (30- 45)

Good >75% of total scores (>45)

**Validity of tools**

Validity testing was done to the tools by submitting it to a 7 jury in the field of "community health nursing in addition to statistics ". Their recommended modifications had been done.

**Pilot study**

A Pilot study was performed after the development of the tools and before starting data collection on 10 % of study sample (13 HCP) who were excluded from the total sample. The aim of the pilot study was to determine the clarity, applicability, and reliability of the research tools and estimate the required time for data collection. Then accordingly necessary modifications were done.

**Field work**

***Administrative and ethical considerations***

Approval was obtained from the researcher ethical committee of Faculty of Nursing Mansoura University and administrator of Students University Hospital after explanation of the aim of the study.

***Procedure of data collection* involving:**

- Start of actual fieldwork at the beginning of January to the end of March 2015.
- Researcher introduction of herself to the HCP and gave them

a brief orientation about aim of the study in order to gain their information.

- Distribution of questionnaires to the HCP at their work setting and collected immediately after completion.
- Distribution of self-administration questionnaires for assessing studied HCP demographic and qualification data (age, occupation, and educational level) and occupational by using Tools I.
- Distribution of self-administration questionnaires for assessing studied HCP's knowledge about infection definition, cycle of transmission, routes of prevention, occupational hazards, and high risk personnel, hand washing and PPE related definitions, types, importance, uses and procedures using Tool II.

**Statistical analysis**

The collected data were organized, tabulated and statistically analyzed using the (Stands for Statistical Product and Service Solutions) (SPSS) version 16. Following data entry, checking and verification processes were carried out to avoid any errors during data entry. Continuous variables were presented as mean ± SD (standard deviation). The threshold of significance is

## 3- RESUTS

**Table (1):** Distribution of the studied health care providers according to their demographic and qualification data

| Demographic characteristic | | N=130 | % |
|---|---|---|---|
| Age | 20-30 | 65 | 50.0 |
| | >30-40 | 45 | 34.6 |
| | more than 40 years | 20 | 15.4 |
| Mean ± SD | | 33.39± 7.23 | |
| Occupation | Physicians | 66 | 50.8 |
| | Head nurses | 6 | 4.6 |
| | Nurses | 27 | 20.8 |
| | Technicians | 21 | 16.9 |
| | Cleaners | 10 | 7.7 |
| Education | Primary and preparatory | 10 | 7.7 |
| | Secondary school | 27 | 20.0 |
| | Technical education | 21 | 16.9 |
| | Baccalaureate | 12 | 9.2 |
| | Higher education Master /Doctorate | 60 | 46.2 |
| Occupational characteristic | | | |
| Years of experience | <5 years | 56 | 42.1 |
| | 5-10 years | 49 | 37.7 |
| | More than 10 years | 25 | 19.2 |

Table 1 shows that, the mean age of study sample was 33.39± 7.23 old, (50.8%) were physicians, (20.8%) were nurses. Regarding educational levels, (46.2 %) of them had (master or doctorate degree).

**Table (2)** Distribution of the studied health care providers according to their source of knowledge about infection control

| Items | N=130 | % |
|---|---|---|
| **Source of knowledge** | | |
| Mass media | 10 | 7.7 |
| Hospital infection control team | 16 | 12.3 |
| Post graduate studies | 48 | 36.9 |
| Colleagues | 3 | 2.3 |

Table 2illustrates that, (36.9%) of HCP acquired knowledge about personnel protective measures from their post graduate studies.

**Table (3)** Distribution of the studied HCP according to their level of knowledge about PPE

| Knowledge categories | Score level | | | | | |
|---|---|---|---|---|---|---|
| | Poor | | Fair | | Good | |
| | N (130) | % | N (130) | % | N (130) | % |
| **Definition of infection(6)** | 101 | 77.7 | 25 | 19.2 | 4 | 3.1 |
| **Mean ± SD** | **46.9±11.8** | | | | | |
| **Routes of infection transmission(4)** | 78 | 59.1 | 39 | 31.1 | 13 | 9.8 |
| **Mean ± SD** | **40.9±31.1** | | | | | |
| **Routes of infection prevention(5)** | 111 | 85.4 | 18 | 13.8 | 1 | 0.8 |
| **Mean ± SD** | **48.9±5.2** | | | | | |
| **Definition and importance of PPE(9)** | 91 | 70 | 29 | 22.3 | 10 | 7.7 |
| **Mean ± SD** | **46.9±12.3** | | | | | |
| **Types of personal Protective Equipment's (7)** | 105 | 80.8 | 23 | 17.7 | 2 | 1.5 |
| **Mean ± SD** | **42.5±4.5** | | | | | |
| **Uses of sterile gloves(3)** | 126 | 95.4 | 2 | 1.5 | 2 | 1.5 |
| **Mean ± SD** | **52.5±4.5** | | | | | |
| **Uses of none sterile gloves (3)** | 129 | 99.2 | 1 | 0.8 | 0 | 0 |
| **Mean ± SD** | **55±2.3** | | | | | |
| **Uses of heavy duty gloves (3)** | 128 | 98.5 | 1 | 0.8 | 1 | 0.8 |
| **Mean ± SD** | **49.5 ±3.8** | | | | | |
| **Uses of sterile gowns(2)** | 127 | 97.7 | 3 | 2.3 | 0 | 0 |
| **Mean ± SD** | **55.1±3.8** | | | | | |
| **Uses of plastic aprons(4)** | 121 | 93.1 | 0 | 0 | 9 | 6.9 |
| **Mean ± SD** | **49.5±5.6** | | | | | |
| **Uses of face shields(3)** | 127 | 97.7 | 3 | 2.3 | 0 | 0 |
| **Mean ± SD** | **55.5±3.8** | | | | | |
| **Uses of legs protection (3)** | 84 | 64.7 | 44 | 33.8 | 2 | 1.5 |
| **Mean ± SD** | **63.4±34.8** | | | | | |
| **Uses of head covers(3)** | 128 | 98.5 | 2 | 1.5 | 0 | 0 |
| **Mean ± SD** | **78±3.0** | | | | | |
| **Uses of goggles (3)** | 103 | 79.2 | 27 | 20.8 | 0 | 0 |
| **Mean ± SD** | **32.2±25.3** | | | | | |
| **Uses of masks(7)** | 120 | 92.3 | 10 | 7.7 | 0 | 0 |
| **Mean ± SD** | **60.8±2.3** | | | | | |
| **Total knowledge score (65)** | 130 | 100 | 0 | 0 | 0 | 0 |
| **Mean ± SD** | **45.4±13.5** | | | | | |

Table (3) represents that the majority of study participants had poor knowledge regarding all concepts related to infection and PPE

**Discussion:**

Effective preventing or limiting infection transmission in health-care settings requires the application of CDC's procedures and protocols.[16]HCP should be knowledgeable about concepts related to PPE use, donning and doffing procedures.[17]

Assessing knowledge for modifying incorrect view will improve performance of providers in a variety of settings.[18] CDC guidance for donning and doffing personal protective equipment (PPE) for all healthcare providers are intended to promote patient safety and increase the safety of the healthcare provider**.[19]**

**World Health Organization (WHO), 2006**[20]**, 2009** [23] **Center of Disease and Control (CDC) 2008** [21]**,Health Infection Control and Prevention Advisory Committee (HICPAC) ,2008**[22]**,**all the previous organizations recommended continuing education for improving health care workers knowledge related to infection prevention and control.

The present study revealed that, the mean age of studied HCP was 33.39± 7.23 years (range 20–25) this finding is consistent with[24], study was conducted at Department of Obstetrics-gynecology in a teaching hospital which is the top referral hospital in West Java Province in Indonesia to assess knowledge, attitude and perceived adherence with universal precaution among health care workers in the obstetrics and gynecology department of an Indonesian teaching hospital who revealed that the mean age of health care workers was 30.1± 11.24 years (median age of 25).

The present study revealed that around one third of studied HCP experience ranged from 5 to 10 years and this finding is consistent with **[25]**study was conducted in El Amery general hospitals ,and El Azher university hospital in Damietta and Port Said general hospitals .Egypt )to evaluate an educational program on nurses' knowledge and practice regarding standard precautions of infection control measures in outpatients clinics who revealed that one third of sample`s (nurses working at outpatient clinics )experience ranged from 5 to 10 years and a little bit more than one third of the sample their years of experience were less than five years.

The finding of the present study illustrated that about one quarter of study sample had knowledge about universal or PPE precautions. This is similar to **[26]**study was conducted in university hospital in the United Arab Emirates Ridge Regional Hospital in the Greater Accra Region of Ghana to assess knowledge about standard precautions among university hospital nurses in the United Arab

Emirates who reflected that , about one third of nurses had obtained information about the concept of standard precaution from classroom lectures given by their teachers .

As regards to the level of knowledge, the present study showed that around three quarter of studied HCP had poor score level of knowledge about definition of infection, more than half of them showed poor score level related to routes of transmission and majority of them showed poor score level related to ways of prevention.

In relation to knowledge about importance of PPE, about three quarters of studied HCP showed poor score level ,and more than three quarters of them showed poor score level regarding types of PPE.

[24]study revealed that one quarter of study sample hadnot knowledge about infection definition, less than one quarter of them had no knowledge about methods of infection transmission chain, and about half of them had no knowledge about methods of preventing spread of infection. In contrast[26]study revealed that majority of study sample were knowledgeable about types and importance of personal protective equipment's. Generally, total score of knowledge of present study were poor among the majority of providers. This study was in agreement with study conducted by[27]on all available internship nursing students (33 students) of College of Applied medical Science, Dammam University at King Khalid Hospital at Hafer Al-Batin city in Kingdom Saudi Arabia to assess the effect of nursing guidelines regarding infection control measures on performance of internship students in Applied Medical Science College at Hafr Al-Batin.

**CONCLUSION**

The main conclusion drawn from the present study is that, the majority of HCPs had poor knowledge related to PPE.

**RECOMMENDATION**

- Implementing educational programs focusing on improving and updating health care providers knowledge related to hand washing and PPE.

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