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# NURSES KNOWLEDGE, PRACTICE AND ATTITUDE REGARDING PREVENTIVE MEASURE OF BIOLOGICAL HAZARDS AT MANSOURA HEALTH INSURANCE HOSPITAL

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**Abstract:**

Biological hazards are one of the most common health risks and the most harmful exposure to health care professionals. Health care professionals are constantly exposed to microorganisms that can cause serious or even lethal infections. Nurses in particular are often exposed to various infections during the course of carrying out their activities. Therefore, nurses should have sound knowledge and strict adherence to infection control practice. **Aim:** This study aimed to assess nurses' knowledge, practice and attitude regarding preventive measure of biological hazards. **Design:** Case study design was used and conducted on 141 of nurses working at Mansoura Health Insurance Hospital. Four - structured questionnaire were used throughout the study for exploring nurses demographic data and occupational characteristics, their knowledge , practice and attitude related to biological hazards. **Results:** The majority of nurses (85.8%) had positive attitude regarding to preventive measures of infection, while 14.2% of nurses had negative attitude. The study showed insignificant negative correlation with educations, and years of experience, there was a significant positive correlation between total knowledge score and total attitude score. The study showed that all of the nurses had unsatisfactory practice related to infection control measures. **Conclusion:** It is necessary to assess nurses' knowledge, practice, and attitude regarding preventive measure of biological hazards to reduce varied unacceptable nurse's practice and raise quality of care. There is a need for educational program about universal precautions especially about handling of the sharps.

**Keywords:** Biological hazards, knowledge, practice, attitude, preventive measure**.**

## Introduction:

## INTRODUCTION

Biological hazards are natural substances that include pathogens, infections, crevices and biodynamic substances (**Abdulraheem, 2012**). Exposure to biological hazards at work place could result in a remarkable number of work-related illnesses (Adler**, 2011**). Approximately 320,000 deaths occurs annually from communicable diseases are caused by work-related exposures to biological hazards (**OSHA, 2012**). The World Health Organization **(WHO, 2011)** reported that thirty five million of healthcare workers (HCWs), have percutenous exposure to infectious diseases annually. Healthcare workers have contact with infected patients and their body fluids. A particularly imperative element is the execution of exposure procedures, which will cause injuries to personnel. Injuries to health workers related to sharp objects are among the most frequently reported occupational accidents in health care (**Hamid, 2010).**

Globally needle stick injuries resulting in 37.6% of hepatitis B, 39% of hepatitis C and 4% of HIV /AIDS among

health professionals (**CDC, 2010**). Most of these infections occur in developing countries in the health care unit as a result of exposure to percutaneous activity (**Amira et al, 2014**). Health workers in Africa endure two to four needle-stick injuries (NSIs) annually on the average with the African country and the Republic of South Africa reaching an average humanitarian outreach (**Mashoto, 2015).** According to the WHO **(2011**), about 150 million individuals worldwide are chronically infected with HCV and viral hepatitis causes 350,000 deaths a year. The occurrence of HBV and HCV in Egypt is excessive and dangerous injection transmission is the greater part of those contaminations. Thus, the threat of NSIs and related contaminations is the highest in Egypt contrasted with alternative nations (Hanafi**, 2011**)

Infection control measures, such as appropriate hand hygiene and the correct application of basic precautions during invasive procedures are simple and of low-cost, but require staff accountability and behavioral change, in addition to improving staff education, reporting and surveillance systems. To utilize these precautions, the human element plays an important role in increasing or decreasing the chances of catching health care acquired infection (HCAI) (**Bouallègue et al, 2013**).

Nurses should provide personnel with sufficient quantities of the appropriate protective clothing and all other personal protective equipment (PPE), especially fine, impermeable, hypoallergenic gloves. They must also ensure that these materials are regularly disinfected, cleaned and, where indicated, mended or repaired. Workers' representatives shall be consulted before a decision on the use of protective equipment is. If work clothes become contaminated they should be changed and then disinfected and cleaned by the employer. Nurses are obliged to use the protective wear and equipment provided. Nurses should not be allowed to take protective wear home for the purpose of washing. Admission to staff lounges, rest areas and canteens is not permitted to personnel wearing protective wear. **(Reda,2010)**

**Significance of the Study:** It has been documented in several epidemiological studies that healthcare workers such as physicians, and nurses are implicated in the transmission of infections. Literature that has explored the knowledge and practices of nurses is limited. Therefore, it is important to further investigate the impact of knowledge and practices of nurses with regard to the degree of the infection control. Assessing compliance with infection control measures in any health care setting is vital. Regular updating and strengthening of infection control practices should be one of the priority function of any place where health services are rendered.

**Aim of the study :** The present study aimed to assess nurses' knowledge, practice and attitude regarding preventive measure of biological hazards at Mansoura health insurance hospital.

**Subjects and Methods**

**Study Design:** Case study design was used in this study. That enabled the researcher to closely investigate the data within a specific context in the selected hospital **(Zainal, 2007).**

***Setting:*** The study was conducted at Mansoura Health Insurance Hospital (M.H.I). This hospital presented at north east of Delta region, provides care for all patient who have health insurance with total bed capacity (360).

**Subjects of the study**

All nurses working at M H.I. were involved in the study (n=155 nurses). Actually 14 nurses involved in the pilot study and 141 nurse were involved in the main study. The 141 nurses were divided into 4 main groups. Each group included

36 nurses. Each main group was divided into three sub-groups, each sub-group was observed three times throughout the 24 hours shift. **Data collection tools:**

The data of the study were collected by using four tools. The first tool was: **Nurse Self- administered demographic and occupational questionnaire:** It was used to assess demographic characteristic of nurses such as; age, sex, and educational level and occupational data of nurses such as: current job, setting of work, years of experience, and training program attended during work. The second tool was **Nurse Self- administered knowledge assessment questionnaire:** It was used to assess nurses' knowledge regarding biological hazards and protective safety measures. It consisted of 39 items divided into 5 major elements namely; definition of biological hazards(1 question), causes of biohazards(10 question) ,source of exposure(10 question), diseases related to biohazards (11 question) and preventive measures of biohazards(12 question). The total scores of the knowledge was categorized into poor knowledge level< 50% of total scores , fair knowledge level from 50% to less than 75% of total sores and good knowledge level ≥75% and more of total scores. The third tool was **Nurse Self-administered attitude Scale**: It was used to assess nurses attitude toward biological hazards. It consists of 29 items requiring a response by using likert -rating scale with five continuum (strongly disagree, somewhat disagree, undecided, somewhat agree, strongly agree). A scoring system was used to quantify nurses positive attitude, in which positive statement were rated on the likert scale to be five for strongly agree and one for strongly disagree. The negative statements were rated on the likert scale to be one for strongly agree and five for strongly disagree. The fourth tool was **Nurse Practice observation checklist**: It was used to observe nurses practice of different procedure . It included 36 items divided into three major elements namely; hand washing, using personal protective equipment and disposal of sharps in safety containers. The total scores of practice was categorized into satisfactory level of practice ≥ 70% and Unsatisfactory level of practice <70%.

**Method**

**Administrative process**

An official permission was issued from ethical committee in the faculty of Nursing Mansoura University to carry out the study. Before conducting the study, an official permission was obtained from the Faculty of Nursing Mansoura University to be submitted to Mansoura health insurance hospital to obtain approval to conduct the study.

Tools of data of collection were developed based on reviewing the relevant literature. The developed data collection tools were tested for its content validity by submitting the tools to experts in community health nursing department who had experience in infection prevention and control. A Pilot study was conducted on 10 % of nurses (14 nurses) who were selected randomly and excluded from the studied sample to evaluate the clarity, applicability. Accordingly, the necessary modification was done, some questions were added, and others were clarified or omitted. The reliability of the attitude scale as measured by using the Cronbach's alpha test was 0.844.

**Data collection**:

All self -administered questionnaires were distributed to the studied nurses for obtaining demographic and occupational data, assessing their knowledge and attitude in relation to biological hazards. On the other hand, nurses were directly observed for their application of infection control measures

by using observational checklist. Structured direct participatory observational technique was used in observing the nurses. All nurses (144) were divided into 4 main groups. Each group included 36 nurses that was divided into three sub-groups, each sub-group was observed three times throughout the 24 hours shift.

**Statistical analysis**

Data was analyzed with stand for statistical protect and service solution (SPSS) software version 20 .The quantitative data were described using numbers and percent. Continuous variable were presented as mean ± standard deviation. Person correlation coefficient was used to estimate the correlation between knowledge, practice, and attitude of nurses regarding biological hazards and its preventive measures. The p value of ≤0.05 indicated a significant result.

**Results**

**Table (1**) shows demographic and occupational characteristics of studied nurses. All nurses were female and their age ranged from 20 years to less than 40 years, with mean age of 26.45± 3.62 years. Less than half of nurses (41.8%) had diploma degree, 44.7% of nurses had technical institute, while only 13.5% had bachelor degree of nursing. About two third 63.1% of nurses did not attend any training program, while only 13.5 % of them attended infection control training program.

**Table(1):** Distribution of nurses according to their demographic and occupational characteristics**.**

| **Items** | **N (141)** | **%** |
|---|---|---|
| **Age (years)** | | |
| 20 -< 25 | 61 | 43.3 |
| 25- < 30 | 41 | 29.1 |
| 30 < 35 | 39 | 27.6 |
| □± SD | **3.62 26.45 ±** | |
| **Educational level** | | |
| Diploma of nursing | 59 | 41.8 |
| Diploma of Technical Nursing Institute | 63 | 44.7 |
| Bachelor of nursing | 19 | 13.5 |
| **Occupation** | | |
| Bedside nurse | 120 | 85.1 |
| Head nurse | 15 | 10.6 |
| Supervisor | 6 | 4.3 |
| **Years of experience** | | |
| <5 | 62 | 43.9 |
| 5 - <10 | 28 | 19.9 |
| 10- and more | 51 | 36.2 |
| □± **SD** | **6.74±4.38** | |
| **Department** | | |
| Medical | 47 | 33.3 |
| Surgical | 34 | 24.1 |
| Other | 60 | 42.6 |
| **Training program** | | |
| None | 89 | 63.1 |
| Infection control | 19 | 13.5 |
| Other | 33 | 23.4 |

- *Other department (ICU, operation, dialysis)*
- *CPR ( cardiac pulmonary Resuscitation)*
- *Other training program (CPR, Blood transfusion)*

**Table (2)** shows the nurses' level of knowledge regarding to biological hazards. Table indicates that 97.2% of nurses showed good level of knowledge about definition of biological hazards with mean± SD (0.97± 0.17). Regarding to the causes, sources of biological hazards and their related diseases 83.0%, 87.2% and 81.6% showed a good level of knowledge with mean scores 8.64± 1.93, 8.22 +1.15 and 9.49 ± 2.12 respectively. While only 57.4% had a good knowledge about preventive measure of biological hazards.

**Table (2**) Distribution of nurses according to their level of knowledge regarding biological hazards

| Items | (Poor < 50%) | | (Fair 50% - 75%) | | (Good ≥75%) | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| Definition of biological hazards score | 4 | 2.8 | 0 | 0 | 137 | 97.2 |
| □± SD | **0.97± 0.17** | | | | | |
| causes of biological hazards score | 8 | 5.7 | 16 | 11.3 | 117 | 83.0 |
| □±SD | **8.64 ± 1.93** | | | | | |
| sources of biological hazards score | 1 | 0.7 | 17 | 12.1 | 123 | 87.2 |
| □± SD | **8.22 ± 1.15** | | | | | |
| Disease related to biological hazard score | 11 | 7.8 | 15 | 10.6 | 115 | 81.6 |
| □± SD | **9.49±2.12** | | | | | |
| prevention of bio logical hazards score | 2 | 1.4 | 58 | 41.1 | 81 | 57.4 |
| □± SD | **10.52 ± 1.72** | | | | | |
| Total knowledge score | 2 | 1.4 | 7 | 5.0 | 132 | 93.6 |
| □± SD | **37.84 ± 4.68** | | | | | |

**Table (3**) shows the level of nurses observed practice related to the application of preventive measures of biological hazards. The majority of nurses showed unsatisfactory practice level related to hand washing during the three shifts. In the morning shift, nurses showed unsatisfactory level of hand washing 88.6% and afternoon 94.3%, while in night 85.1 %. For example, nurses did not wash their hands before and after any interference with patient. This related unavailability of to sinks, or their inconvenient place, in addition to lack of soap, and towels. As regards to personal protective measure the majority of nurses showed unsatisfactory practice level among 96.4% of nurses in night shift 92.9% in after noon shift and 90.0 % in morning shift. Regarding safe handling of wastes, the majority of nurses showed unsatisfactory practice level in the three shifts due to shortage of nurses. This mistake could be summarized in recapping needle after used, improper dealing with blood and waste product.

**Table (3)** Distribution of nurses according to their level of practice about hand washing, personal protective measures and safe handling

| **Items** | **(Unsatisfactory** <70%) | | **(Satisfactory** ≥ 70%) | |
|---|---|---|---|---|
| **Hand washing** | **N** | **%** | **N** | **%** |
| Morning | 125 | 88.6 | 16 | 11.3 |
| After noon | 133 | 94.3 | 8 | 5.6 |
| Night | 120 | 85.1 | 21 | 14.8 |
| **Using personal protective measure** | | | | |
| Morning | 127 | 90.0 | 14 | 9.9 |
| After noon | 131 | 92.9 | 10 | 7.0 |
| Night | 136 | 96.4 | 5 | 3.5 |
| **Safe handling of wastes** | | | | |
| Morning | 141 | 100 | 0 | 0 |
| After noon | 141 | 100 | 0 | 0 |
| Night | 141 | 100 | 0 | 0 |
| **Safe handling of sharps** | | | | |
| Morning | 141 | 100 | 0 | 0 |
| After noon | 141 | 100 | 0 | 0 |
| Night | 141 | 100 | 0 | 0 |

**Tables (4, 5**) show that attitude of nurses regarding biological hazards. The majority of nurses (85.8%) had positive attitude related to infection control measures to prevent infection and spread of diseases, while 14.2% of nurses had negative attitude as some of health care worker mentioned that application of infection control measures take long time, need more effort, and applied only for patient with infectious diseases.

**Table (4)** Distribution of nurses according to their positive attitude regarding biological hazards

| Items | Strongly disagree | | Disagree | | Not sure | | Agree | | Strongly agree | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % | N | % |
| **Positive attitude** Follow infection control guidelines protect from injury at work | 0 | 0 | 0 | 0 | 2 | 1.4 | 17 | 12.2 | 122 | 86.5 |
| Infection control guidelines help, provide the best care for the patient. | 2 | 1.4 | 2 | 1.4 | 0 | 0 | 37 | 26.2 | 100 | 70.9 |
| Use infection control guidelines when dealing with each patient to minimize transmission of infection | 0 | 0 | 4 | 2.8 | 0 | 0 | 30 | 21.3 | 107 | 75.9 |
| Infection control guidelines can prevent the spread of infection from the patient to health workers and vice versa | 2 | 1.4 | 0 | 0 | 4 | 2.8 | 27 | 19.1 | 108 | 76.6 |
| All health care providers must be ensured with availability of adequate protection when doing any action | 2 | 1.4 | 0 | 0 | 9 | 6.4 | 44 | 31.2 | 86 | 61.0 |
| Medical and non-medical waste separation is useful in preventing the transmission of infection. | 0 | 0 | 1 | 1.7 | 0 | 0 | 28 | 19.9 | 112 | 79.4 |
| General waste should be disposed in black bags | 3 | 2.1 | 0 | 0 | 0 | 0 | 33 | 23.4 | 105 | 74.5 |
| The disposal of needles as one unit reduces the exposure to acupuncture | 0 | 0 | 6 | 4.3 | 12 | 8.5 | 19 | 13.5 | 104 | 73.8 |
| place safety containers close to work reduces the exposure to acupuncture and the spread of infection | 2 | 1.4 | 1 | 0.7 | 0 | 0 | 28 | 19.9 | 110 | 78.0 |
| It is necessary to use personal protective equipment in case of emergency | 9 | 6.4 | 1 | 0.7 | 2 | 1.4 | 44 | 31.2 | 85 | 60.3 |
| Infection control guidelines necessary not touch technology to ensure that the tools remain sterile while doing nothing | 4 | 2.8 | 3 | 2.1 | 2 | 1.4 | 47 | 33.3 | 85 | 60.3 |
| It is necessary not sharing personal protective equipment with any one | 9 | 6.4 | 22 | 15.6 | 12 | 8.5 | 21 | 14.9 | 77 | 60.3 |
| Wash hands before and after any interference with the patient | 4 | 2.8 | 5 | 3.5 | 2 | 1.4 | 25 | 17.7 | 105 | 54.6 |
| Transmission of infectious organisms can be reduced by adhering to the principles of infection control | 0 | 0 | 4 | 2.8 | 12 | 8.5 | 35 | 24.8 | 90 | 63.8 |
| Cleansing should ensure that medical equipment by all health care workers | 2 | 1.4 | 3 | 2.1 | 8 | 5.7 | 45 | 31.9 | 83 | 58.9 |
| Vaccination against infectious and dangerous diseases helps to minimize biological risks | 0 | 0 | 0 | 0 | 3 | 2.1 | 47 | 33.3 | 91 | 64.5 |
| Vaccination against hepatitis B is important | 0 | 0 | 2 | 1.4 | 2 | 1.4 | 26 | 18.4 | 111 | 78.7 |
| **Total attitude score (□± SD)** | **77.83± 5.16** | | | | | | | | | |

**Table (5)** Distribution of nurses according to their negative attitude regarding biological hazards

| Items | Strongly disagree | | Disagree | | Not sure | | Agree | | Strongly agree | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % | N | % |
| **Negative attitude** | | | | | | | | | | |
| Follow infection control guidelines take a lot of time | 33 | 23.4 | 34 | 24.1 | 3 | 2.1 | 58 | 41.1 | 13 | 9.2 |
| Follow infection control guidelines make the work hard | 27 | 19.1 | 22 | 15.6 | 9 | 6.4 | 75 | 53.2 | 8 | 5.7 |
| Follow infection control practices cumbersome and uncomfortable | 31 | 22.0 | 18 | 12.8 | 17 | 12.1 | 57 | 40.4 | 18 | 12.8 |
| Infection control guidelines consume a lot of effort | 36 | 25.5 | 35 | 24.8 | 15 | 10.6 | 42 | 29.8 | 13 | 9.2 |
| Infectious diseases can be treated and thus are not required to use protective devices | 21 | 14.9 | 11 | 7.8 | 11 | 7.8 | 33 | 23.4 | 65 | 46.1 |
| Infection control practices limited only to patients with infectious diseases | 30 | 21.3 | 22 | 15.6 | 7 | 5.0 | 47 | 33.3 | 35 | 24.8 |
| Use of normal alcohol alternative causes the stability of the virus on the hands | 56 | 39.7 | 11 | 7.8 | 38 | 27.0 | 25 | 17.7 | 11 | 7.8 |
| Wear personal protective equipment hinder the work | 31 | 22.0 | 7 | 5.0 | 15 | 10.6 | 61 | 43.3 | 27 | 19.1 |
| Use of personal protective equipment may harm the patient psychologically, so it should not be used | 21 | 14.9 | 13 | 9.2 | 14 | 9.9 | 53 | 37.6 | 40 | 28.4 |
| Change gloves are not necessary during the procedures per patient if contaminated significantly | 32 | 22.7 | 8 | 5.7 | 8 | 5.7 | 57 | 40.4 | 36 | 25.5 |
| The telephones and doorknobs in the wards is not a source of infection | 38 | 27.0 | 13 | 9.2 | 22 | 15.6 | 53 | 37.6 | 15 | 10.6 |
| Use extra precautions for patients with infectious diseases is a waste of resources | 56 | 41.8 | 12 | 8.5 | 13 | 9.2 | 39 | 27.7 | 18 | 12.8 |
| **Total attitude score (□± SD)** | **34.84±12.18** | | | | | | | | | |

**Tables (6, 7)** show insignificant negative correlation between education and experience. Results indicated significant positive correlation between total knowledge score, practice score, and total attitude score.

**Table (6)** Correlation between nurses' education and years of experience and their level of knowledge, practice, and attitude score

| Items | Education | | Experience | |
|---|---|---|---|---|
| | r | p | r | p |
| Practice | -0.079 | 0.352 | - 0.036 | 0.671 |
| Knowledge | -0.50 | 0.556 | - 0.034 | 0.691 |
| Attitude | - 0.002 | 0.979 | -0 .057 | 0.502 |

**Table (7)** Correlation between nurses total knowledge score ,total practice score and total attitude score.

| Items | Knowledge | |
|---|---|---|
| | r | p |
| Practice | 0.170 | 0.044 |
| Attitude | 0.173 | 0.040 |

**Discussion**

Healthcare workers (HCWs) are at increase of catching blood- borne infections in their daily work throw job - related factors. Globally, needle stick injuries (NSIs) are most common source of occupational exposures to blood which result in transmission of blood -borne infections (**Amira, et al 2014).** The present study found that the majority of nurses had a good level of knowledge in relation to blood borne pathogens. This was in agreement with other studies conducted at different countries revealed good knowledge regarding to occupational exposures to blood borne pathogens. The first study was conduct in Nigeria by **Okechuku, (2012)** and another study was conduct in India by **Jain & Dogra,( 2012).** Regarding to nurses knowledge about definition of biological hazards, causes, sources and mode of transmission, the present study showed that nurses had good level of knowledge. Several studies reported that nurses were knowledgeable about definition of infection, causes, sources and mode of transmission **(Talaat et al, 2010 and Ebied, 2011)**. Theses finding were consistent with the results of the current study and with other study conducted at Egyptian neonatal intensive care unit, which found that Egyptian nurses were knowledgeable about definition of infection and different mode of transmission **Ibrahim et al, (2011)**. Concerning preventive measures about biological hazards, the current study demonstrated that the majority of studied nurses had good knowledge related to preventive measure. These results at the same line with ***Ford, (2011*** )who found that the most of healthcare workers were aware about safety precaution against occupational biological hazards, complete immunization against Hepatitis B virus and post-exposure prophylaxis.

As regards to the level of practice, the present study showed that the most of nurses had unsatisfactory practice regarding to hand washing, using of personal protective equipment, and safe handling of contaminated materials. This study was in agreement with other studies that were conducted in India and Vietnam **Manisha, (2012) and Thu, (2012).** Hand hygiene is the first step towards effective infection control in any health facility. The present study showed that hand washing was rarely done before and after getting in contact with and removing the gloves. This was in agreement with **Suchitra, (2007) and Manisha,( 2012** )who found that the most common reasons reported for poor adherence to hand hygiene were the inconvenient placed sinks, followed by lack of soap/water, and insufficient time. Some of reported leading practices to exposure to biological hazards were needle recapping after used, improper handling of blood and waste product.

The unsatisfactory infection control practice of nurses in the current study may be referred to the insufficient continuous education, as around two -third of nurses did not attend any training program. The present study revealed that this finding is consistent with two studies. The first study conduct by **Nagaraju, (2013** ) among healthcare providers working in PHCs of Bagepalli Taluk found who that about two- third of the studied healthcare providers would never attend any continuing education course. The second study was conduct by

**Fashafsheh, (2015)** among nursing staff in the palastinian hospitals, the study revealed that the majority of healthcare providers (83%) did not attend any training program. Both studies showed that healthcare workers rarely wash their hands before and after attending contacting a patient, or after having contacting body fluids. In addition, they were not use personal protective equipment (PPE) adequately.

As regards to the of attitude of nurses toward biological hazards and their protective measures, the present study revealed that most of nurses had a positive attitude towards adherence to infection control measures that control exposure to biological hazards with mean scores of (77.83± 5.16). These results agreed with study conduct by **Picheansathian, (2008)** who reported that respondents had positive attitude toward infection control measures. In addition, **Patel, (2012)** in a tertiary health care center in India reported a positive attitude of 60% of nurses for safe collection measures and final disposal of biomedical waste. On the other hand, nearly half of nurses of the current study showed a negative attitude toward controlling measures of biological hazards because of limited time and over work load . This result agreed with the study conduct by **Magoro, (2012)** and **Nour, (2015**) who reported that a negative attitude among health care providers toward infection control measures.

Concerning the correlation between knowledge and practice, the present study showed a significant positive correlation between nurses' knowledge and practice. This was in agreement with several studies which revealed a statistically significant positive correlation between knowledge and practice of universal precautions.( **Whyte, 2009**. **Khan , 2014, Almutairi , 2015, Ndikom, & Onibokun, 2007, Hamid , 2010, Eskander,2013)**

**Conclusion and Recommendation**

The study concluded that nurses working at the Mansoura Health Insurance Hospital have good level of knowledge regarding biological hazards and their preventive measures. They have a positive attitude towards adherence to infection control measures that control exposure to biological hazards. However, nurses show unsatisfactory practice of preventive measures of biological hazards. The lack of resources and inappropriate required infrastructure for hand hygiene in particular are the main reasons of poor adherence to hand hygiene and using of personal protective measures.

1. A periodic and ongoing reorientation program regarding universal precautions is essential for preventing the hospital-acquired infections
2. Infection control committee of hospital should take initiative to improve hand hygiene and provide required resources
3. Efficient supervision for implementing preventive measures would be strengthened

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