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**LEVEL OF KNOWLEDGE ABOUT BLOOD BORNE DISEASE IN  
NURSES WORKING IN TERTIARY CARE HOSPITAL**

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**Research Project Report Submitted  
to the  
Department of Community Medicine  
Ayub Medical College, Abbottabad**

**By**



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**Ayub Medical College  
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**SUPERVISOR'S CERTIFICATE**

I, hereby, certify that **Mr. ARSHAD ULLAH**, Roll. No. **15-041** has successfully completed his research project entitled “**Level of knowledge about blood borne diseases in nurses working in tertiary care hospital**”

He has been working under my supervision the enclosed Report is prepared according to the Departmental guidelines. I have read the thesis and have found it satisfactory as per requirements of the department.

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## **LIST OF ABBREVIATIONS:**

HBV: Hepatitis B virus

HCV: Hepatitis C virus

AIDS: Acquired immunodeficiency syndrome

HIV: Human immunodeficiency virus

WHO: World health organization

CD4: Cluster of differentiation 4

HBsAg: Hepatitis B surface antigen

PCR: Polymerase chain reaction

EIA: Enzyme immunoassay

CDC: Centers for disease control

BBPs: Blood Borne Pathogens

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## **ABSTRACT:**

### **Background and purpose:**

Blood-borne pathogens (BBP) [hepatitis B virus (HBV), hepatitis C virus (HCV), and HIV] pose a considerable infectious risk for nurses, resulting in unwanted health outcomes and psychological stress.

**Objective:** The study aimed to assess the level of knowledge among nurses working in a tertiary care hospital about blood borne diseases like HIV/AIDS, Hepatitis B and C etc.

**Methods:** A cross-sectional study was carried out from December 2018 to June 2019 using an interview based questionnaire. Interview was taken from 107 nurses working in the Ayub teaching Hospital, Madian Abbottabad, with a response rate of 89.16% (107/120).

**Results:** A total of 107 nurses participated with 91(85%) females and 16(15%) males. The nurses are of different ages with mean 30.14. 57(53.3%) nurses are diplomate, 10(9.3%) are graduate, 40(37.4) are undergraduates. Majority of them are staff nurses. 91(85%) nurses correctly defined the term blood borne disease, 5(4.7%) cannot defined correctly and 11(10.3%) did not know about this definition. 80(74.8%) known about the name and causative agents of blood borne diseases, 13(12.1%) wrongly answered, 1(.9%) did not know about it, 13(12.1%) are missing. 30(28.0%) correctly answered about the risk factors of blood borne disease, 24(22.4%) wrongly answered and 53(49.5%) don't know risk factors of these diseases.

21(19.6%) answered that Hepatitis B is preventable. 2(1.9%) answered that Hepatitis C is preventable, 3(2.8%) answered about AIDS, 8(7.5%) answered that Hepatitis B and C both are preventable, 34(31.8%) answered that all blood borne diseases is preventable, 39(36.4%) don't about it. After getting needle stick injury, 31(29.0%) answered that they consult to physician, 19(17.8%) answered they vaccinate themselves, 16(15%) answered for screening, 10(9.3%) answered both for vaccination and screening, 16(15.0%) said other methods and 15(14.0%) don't know about it. 53(49.5%) answered that blood borne diseases have effective treatment, 34(31.8%) answered that they are not treatable, 20(18.7%) don't about it. Overall 12.1% don't know about these infections. 18.7% are in satisfactory category, 58.9% are in good and 10.3% are in excellent category.

**Conclusion:** Both the knowledge and the practice of Ayub teaching hospital's nurses against BBP and Infection Control standards were fair. In our study about 70% of nurses have reasonable knowledge about blood borne infections. But 30% have inadequate knowledge about these infections. Healthcare facilities should focus on increasing nurses' awareness for strict adherence to Infection Control standards, and implement training and preventive programs to minimize the risk of needle-stick injuries. All nurses should be vaccinated against HBV.

**Keywords:** blood borne diseases, blood-borne pathogens, infection control, knowledge, nurses, practice

## **INTRODUCTION:**

Blood-borne pathogens (BBP) are microorganisms that cause infections to human through the blood stream. Pathogens include, and are not limited to, hepatitis B virus (HBV), hepatitis C virus (HCV), and HIV. Needle sticks and other sharps-related injuries may expose workers specially nurses to blood borne pathogens. <sup>(1)</sup>

Nurses are likely to be exposed to microorganisms during their daily practice because of their close and frequent direct contact with patients. This could be one of the main causes of transmission of infection to nurses and patients as well. <sup>(2)</sup>

Nosocomial infection or hospital-acquired infection (HAI) refers to infection that is acquired during the process of care and not manifested at the time of admission to a hospital or other healthcare facility. <sup>(3)</sup> It has been estimated that the risk of Hospital Acquired Infection is 2–20 times higher in non-developing countries compared with developed countries and 5 and 10% of patients admitted to hospitals in developed countries acquire these infections. <sup>(4)</sup>

There have been several reports of health-care workers infected with blood-borne pathogens. According to the WHO 2002, 2.5% of HIV cases and 40% of both HBV and HCV cases worldwide are the result of occupational exposure among Healthcare workers. The first report of HIV transmitted to a HCW as a result of a NSI was published in 1984. A report that was published in Ireland in 1997 stated that employees involved in exposure-prone procedures get blood borne diseases more often than others. <sup>(5)</sup> It is Estimated that, in the year 2000, 16,000 HCV, 66,000 HBV and 1000 HIV infections may have occurred worldwide among health care workers (HCWs). Globally, out of 39.5 million health-care workers three million experience exposure to infectious diseases each year and 40% of hepatitis B, and C and 2.5% of HIV/AIDS in Heath care workers. <sup>(6)</sup> A study conducted in USA in 2004 in which incidence rate per hundred beds was 26.7% and similar study was conducted in France in which the incidence rate per 100 bed was 8.9%. A study conducted in India showing incidence rate per hundred beds was 46% and prevalence ranging from 45% to 60%. Different studies showing prevalence ranging from 45% to 80% in Pakistan. A study conducted in northern districts of Pakistan in which HIV was not detected in the HCWs while rate of prevalence of HCV and HBV was far less (0.8 % and 0.64 %, resp.) as compared to general population (4.7%-38%). <sup>(7)</sup>

In the health care setting, blood-borne pathogen transmission occurs predominantly by percutaneous or mucosal exposure of workers to the blood of infected patients. Occupational exposures that may result in HIV, HBV, or HCV transmission include needle stick and other sharps injuries; direct inoculation of virus into cutaneous scratches, skin lesions, abrasions, or burns; and inoculation of virus onto mucosal surfaces of the eyes, nose, or mouth through accidental splashes. HIV, HBV, and HCV do not spontaneously penetrate intact skin, and airborne transmission of these viruses does not occur. Occupational exposures include contact of the eyes, mouth, other mucous membranes, or broken skin and parenteral contact with blood or other potentially infectious materials. Different factors can affect the blood borne diseases including exposure to the blood borne pathogen, unnecessary injections and non-using of gloves and masks can lead to such cases of blood borne diseases in nurses.<sup>(8)</sup>

The prevention of occupational infection with blood borne pathogens is possible, but is dependent on integrating three closely related strategies: avoidance of exposure, immunization, and post-exposure prophylaxis. This Research will help in management of blood-borne pathogen infections in nurses include more systematic surveillance of occupationally acquired HIV, HBV, and HCV infection. We can also get an idea about the awareness and level of knowledge about blood borne diseases in nurses working in tertiary care hospital. By getting this idea we can implement further preventive measures to protect nurses and other health care workers from being infected from these blood borne pathogens. Nurses who have more knowledge will report higher compliance with SPs and professional behavior. The present study was aimed at examining the relationship between nurses' knowledge of BBPs, their professional behavior regarding handwashing and compliance with SPs, and avoidance of therapeutic contact with BBP-infected patients.<sup>(9)</sup>

The aim of this study is to assess the level of knowledge of nurses working in a tertiary care hospital about blood borne diseases like Hepatitis B, C and HIV/AIDS. It will also produce awareness among nurses about such deadly infection. To bring in the notice of health care authorities about knowledge of nurses regarding blood borne diseases. Study results will show situation of nurses at Ayub Teaching Hospital for further intervention.

### **OPERATIONAL DEFINITION:**

Level of knowledge is assessed based on following categories:

- Those who answer 1-3 questions correctly are in poor category.

- Those who answer 3-6 questions correctly are in Satisfactory category.
- Those who answer 7-10 questions correctly are in Good category.
- Those who answer above 10 correctly are in excellent category.

## **Literature Review:**

Exposure to blood in health care-associated infections are serious problems that threaten both patients and health care workers, including nurses. It is very important to nurses to have sufficient knowledge about blood borne diseases and blood borne pathogens. Getting an infection can result in serious morbidity and mortality. Acute infection leads to chronic infection in 60% -80% of cases, 20%-50% develop cirrhosis in 2-3 decades, and 11%-50% will develop liver cancer.<sup>(10)</sup>

Numerous international self-report studies describe poor precautionary measures among health care professionals, including nurses, with regard to eye protection, needle recapping, appropriate glove use, handwashing before and after patient contact, use of face masks, avoidance of a used needle. The unpredictable nature of trauma resuscitation leads to a higher risk of transmitting blood borne pathogens. One study based in the United States was unique because the researchers directly observed 104 doctors and nurses in performance of 12 trauma resuscitations. Full compliance was reported in 3% of workers and individual rates varied with 98% compliance reported for gloves, 51% for eye protection, 41% for gowns, and 10% for masks. Perioperative nursing is a high-risk specialty because of the increased likelihood of occupational exposure to blood and other body substances.<sup>(11)</sup>

In Poland 601 surgical nurses were surveyed with only 5% of respondents reporting full compliance with all items and was highest for glove use (83%) and lowest for protective eyewear (9%).<sup>(12)</sup> Kermode et al conducted a survey of health care workers in rural north Indian settings with similar results. Only 11% of workers reported being compliant with all SP items and 67% reported always wearing gloves, 32% eye protection, 54% gowns, and 59% masks.<sup>(13)</sup>

An Egyptian study conducted among nurses reported a compliance rate of 57.5% with the proper and consistent use of personal protective equipment during injection procedures.<sup>(14)</sup>

In a 1945 memorandum from the United Kingdom Ministry of Health, it was concluded that viral hepatitis following injection treatment was “communicated by traces of blood transferred on syringes and needles from patient to nurses.”<sup>(15)</sup>

Outbreaks of jaundice following injection campaigns in the 1940s and 1960s among nurses of Royal Air Force Hospital who received multiple immunizations clearly linked infection with injections for which syringes were reused after changing the needle only. This observation has been supported by laboratory studies demonstrating that syringes become contaminated because of negative pressure is generated when the needle is removed.<sup>(16)</sup>

In the last 2 decades, the issue of professional behavior has been a focus of discussion in the infection control (IC) community. Many investigators have examined levels of knowledge on the prevention of nosocomial pathogen transmission, rates of compliance with standard precautions (SPs), and their effect on professional behavior. However, less research has been focused on the relationship between knowledge of blood borne pathogens (BBPs), understanding of basic assumptions of IC principles, and compliance with SPs.<sup>(17)</sup>

Kemppainen, Dubbert, & McWilliams, in 1996 in United Kingdom investigated attitudes toward HIV infected patients and the desire to refrain from caring for these patients among 165 registered nurses and nursing students. Thirty-six percent of nurses and 26% of students stated that they would refrain from caring for these patients.<sup>(18)</sup>

Martin & Bedimo (2000) in USA examined willingness to care for patients with HIV/AIDS, HCV among 628 advanced nurses. They found that 21% to 31% of respondents were very to somewhat uncomfortable in providing care for these patients 18% of the nurses indicated that they would not provide health care to HIV-infected individuals and would refer care to other providers. In a further study, 22% of respondents reported that they had “considerable” to “very strong” objections to treating HIV-infected patients. Twenty-four percent of the sample reported that they had difficulty working in the same environment as a person with HIV.<sup>(19)</sup>

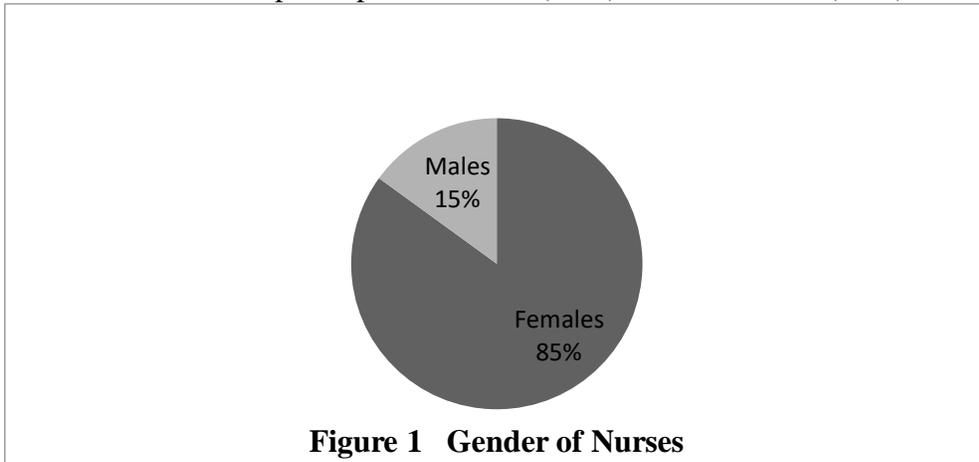
A study that was conducted on 306 nurses in Hong Kong and was found having a deficit knowledge about blood borne diseases. In response to the statement “Universal precautions should be applied to all persons regardless of their infectious status,” 75.5% of the participants responded “True.” To the question “Universal precautions are applicable to patients with HIV and HBV only,” 84.6% replied “False.” Many investigators have reported the contribution of training and education to knowledge (Calabro, Weltge, 2005) and compliance with hand hygiene and SPs (Creedon, 2005). They have generally reported effects that are temporary and require constant reinforcement.<sup>(20)</sup>

## **MATERIAL AND METHODS:**

A cross sectional study of permanent employed nurses was conducted in Ayub teaching hospital Abbottabad within around 12 months. The total population of permanent employed nurses in Ayub teaching hospital were 324. Our sample size was 107. The sample was selected by the convenience sample method which is the non-probability sampling technique. The data was collected on interview base questionnaire which consist of biodata of nurses that is name, gender, age, qualification, duration of service, designation and questions related to HIV/AIDS, hepatitis B and C. The general information included that is term blood borne disease, causative agent, source of infection, risk factors, common disease, transmission, susceptible person, post exposure prophylaxis, preventive measure and treatment against these diseases. The nurses were interviewed in the wards in morning and in evening time by taking verbal consent. The nurses were informed about the study, some of them refuse to answer. The data entry and analysis was done in SPSS version 16.0.

**RESULTS:**

A total of 107 nurses participated with 91 (85%) females and 16 (15%) males.



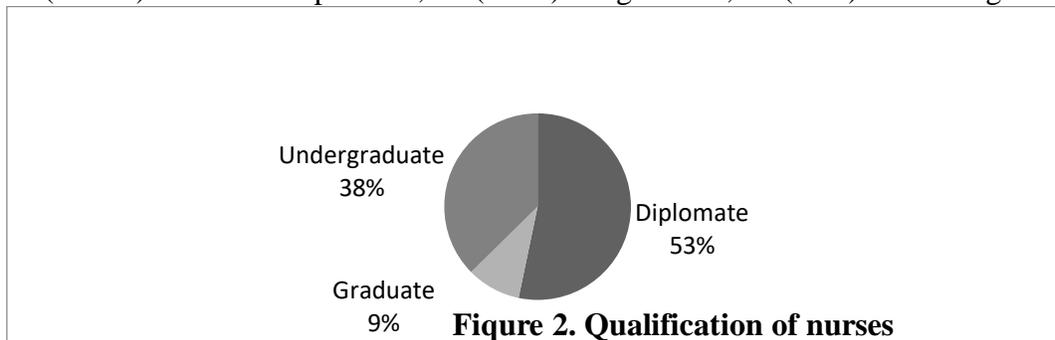
The nurses are of different ages with mean 30.14, median 30.00, mode 22, and standard deviation 7.655.

**Table 1. Age of nurses**

Age	Frequency	Percent
18	1	.9

20	6	5.6
21	5	4.7
22	9	8.4
23	7	6.5
24	5	4.7
25	4	3.7
26	6	5.6
27	3	2.8
28	3	2.8
29	4	3.7
30	9	8.4
31	1	.9
32	8	7.5
34	3	2.8
35	7	6.5
36	3	2.8
37	2	1.9
39	5	4.7
40	9	8.4
42	1	.9
45	3	2.8
46	1	.9
50	1	.9
52	1	.9
Total	107	100.0

57 (53.3%) nurses are diplomate, 10 (9.3%) are graduate, 40 (37.4) are undergraduates.



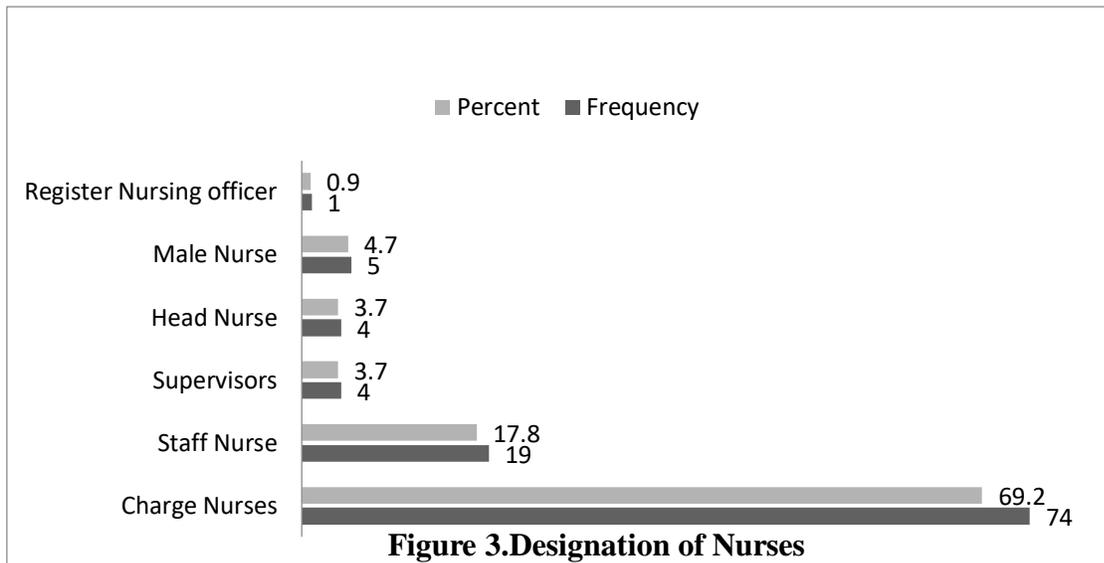
The duration of nurses is different for different ages with mean 8.170, median 5.00, mode 1.0, and standard deviation of 7.3978.

**Table 2. Duration of service in years**

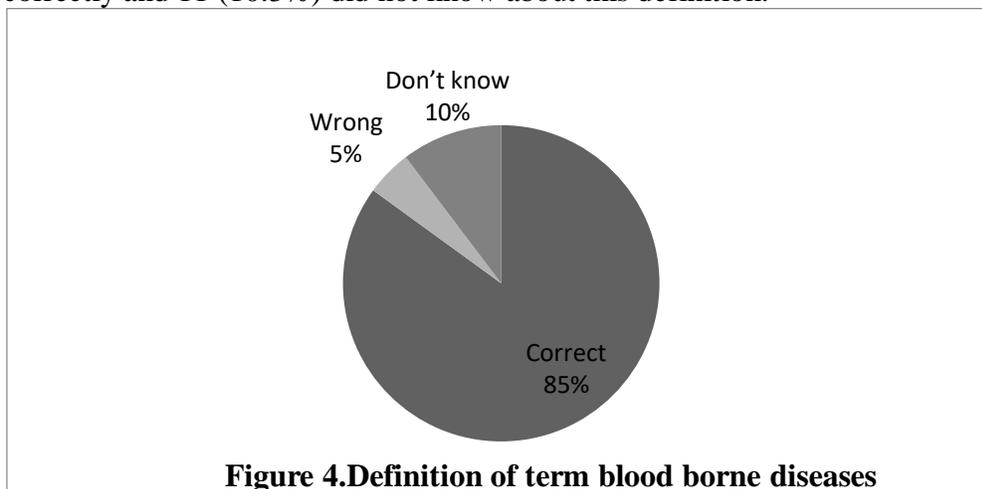
Duration in years	Frequency	Percent
0.1	1	.9
0.3	2	1.9

1	14	13.1
2	8	7.5
2.5	1	.9
3	13	12.1
4	5	4.7
5	10	9.3
6	8	7.5
7	5	4.7
8	2	1.9
9	5	4.7
10	5	4.7
12	2	1.9
13	2	1.9
15	2	1.9
16	1	.9
17	1	.9
18	3	2.8
19	3	2.8
20	5	4.7
21	2	1.9
22	2	1.9
23	3	2.8
26	1	.9
33	1	.9
Total	107	100

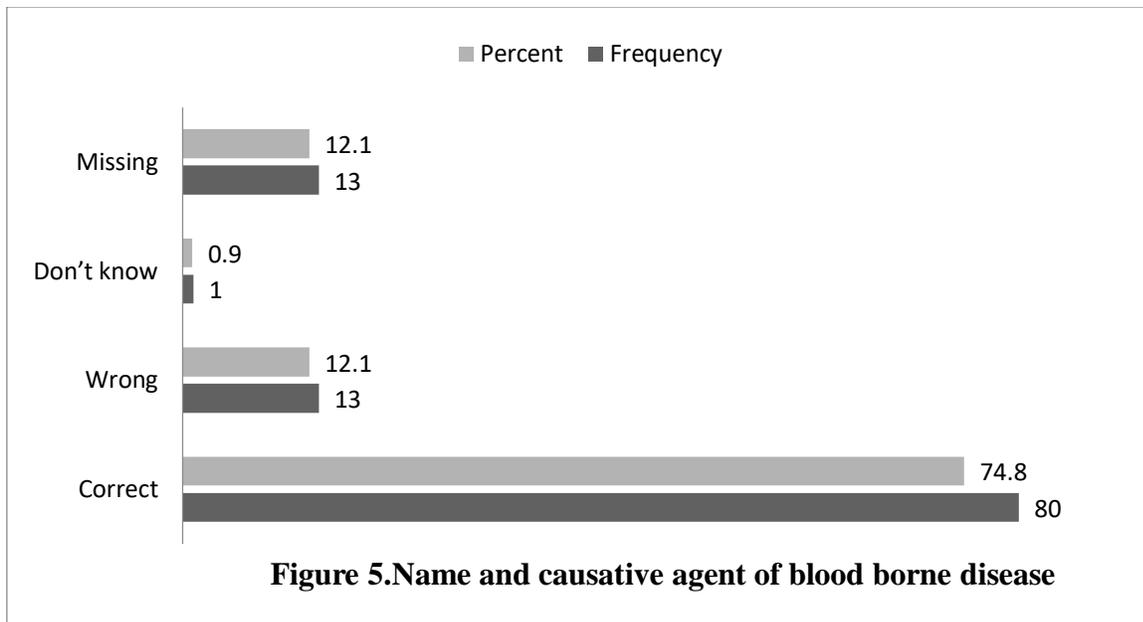
There are 74 (69.2%) charge nurses, 19 (17.8%) are staff nurses, 4 (3.7%) are supervisors, 4 (3.7%) are head nurses, 5 (4.7%) are male nurses and 1 (0.9%) are register nursing officer.



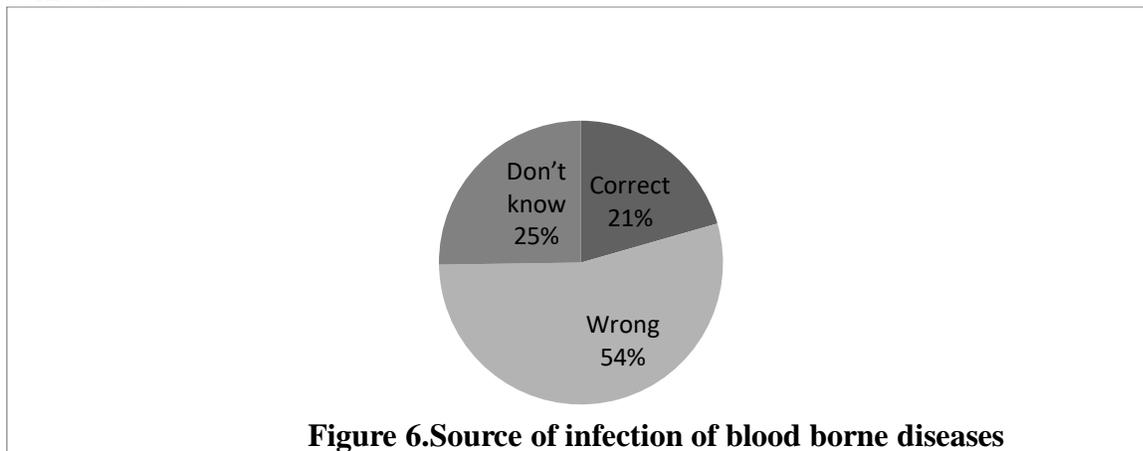
91 (85%) nurses correctly defined the term blood borne disease, 5 (4.7%) cannot defined correctly and 11 (10.3%) did not know about this definition.



80 (74.8%) nurses known about the name and causative agents of blood borne diseases, 13 (12.1%) wrongly answered, 1 (.9%) did not know about it, 13 (12.1%) are missing.



22 (20.6%) nurses correctly answered about source of infection of blood borne disease, 58 (54.2%) wrongly answered and 27 (25.2%) did not know about the source of infection of blood borne disease.

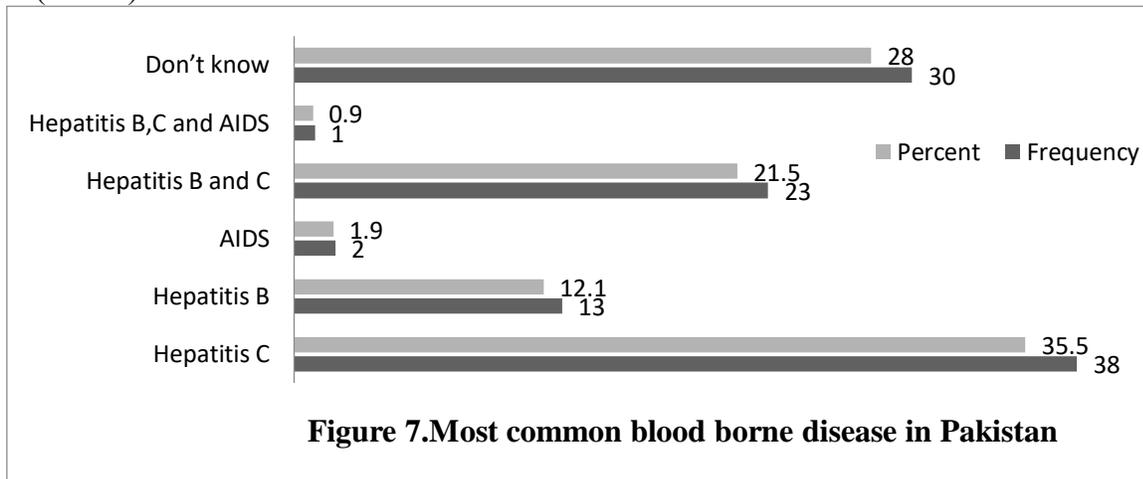


30 (28.0%) Nurses Correctly answered about the risk factors of blood borne disease, 24 (22.4%) wrongly answered and 53 (49.5%) don't know risk factors of these diseases.

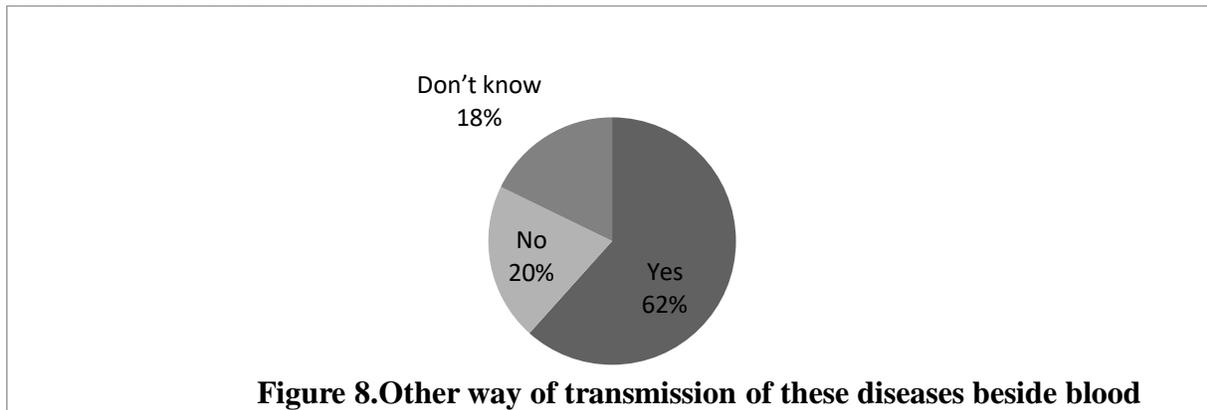
**Table 3. Risk factors of blood borne diseases**

	Frequency	Percent
Correct	30	28
Wrong	24	22.4
Don't know	53	49.5
Total	107	100

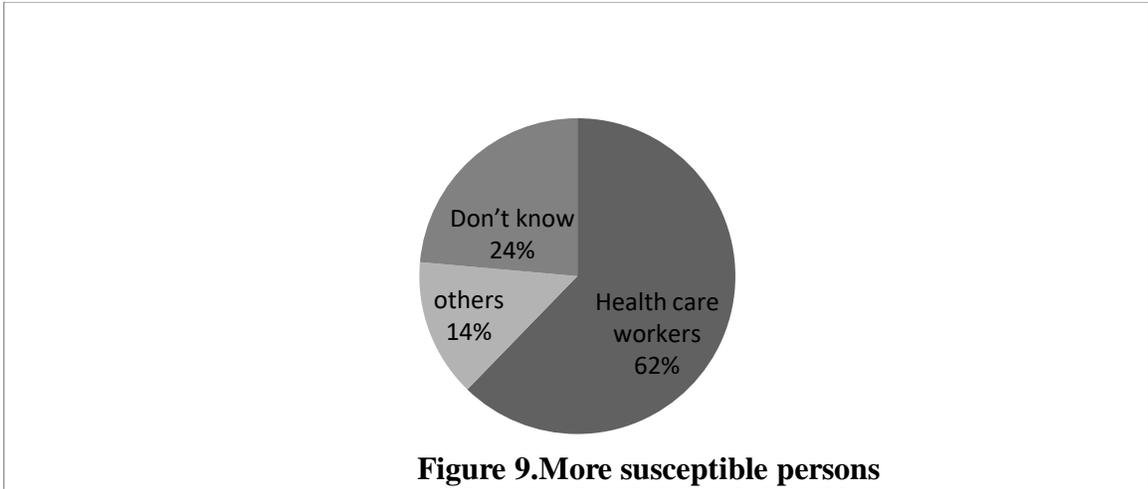
Majority of nurses answered that hepatitis C is the most common blood borne disease in Pakistan that is 38 (35.5%), 13 (12.1%) answered hepatitis B, 2 (1.9%) answered AIDS, 23 (21.5%) answered both hepatitis B and C, 1 (.9%) answered about hepatitis B, C and AIDS and 30(28.0%) don't know about these diseases.



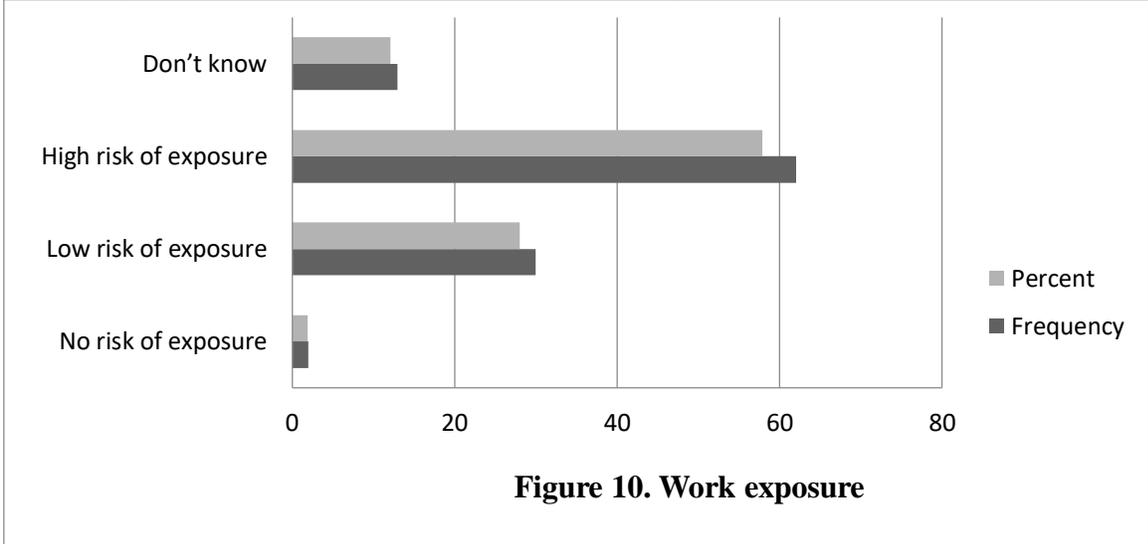
66 (61.7%) answered that these diseases can be transmitted beside blood. 22 (20.6%) answered that these diseases cannot be transmitted beside blood. 19 (17.8%) don't know about transmission of these diseases beside blood.



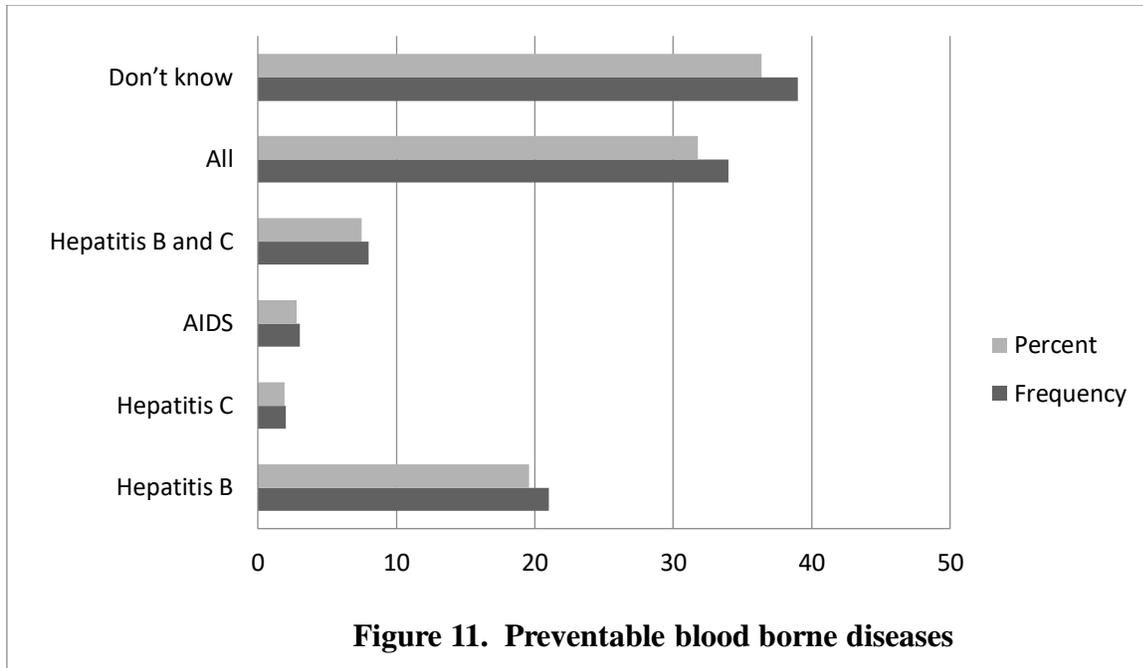
66 (61.7%) answered that health care workers are more susceptible to blood borne diseases, 25 (23.4%) don't know about more susceptible person, 15 (14.0%) answered others are more susceptible than health care workers.



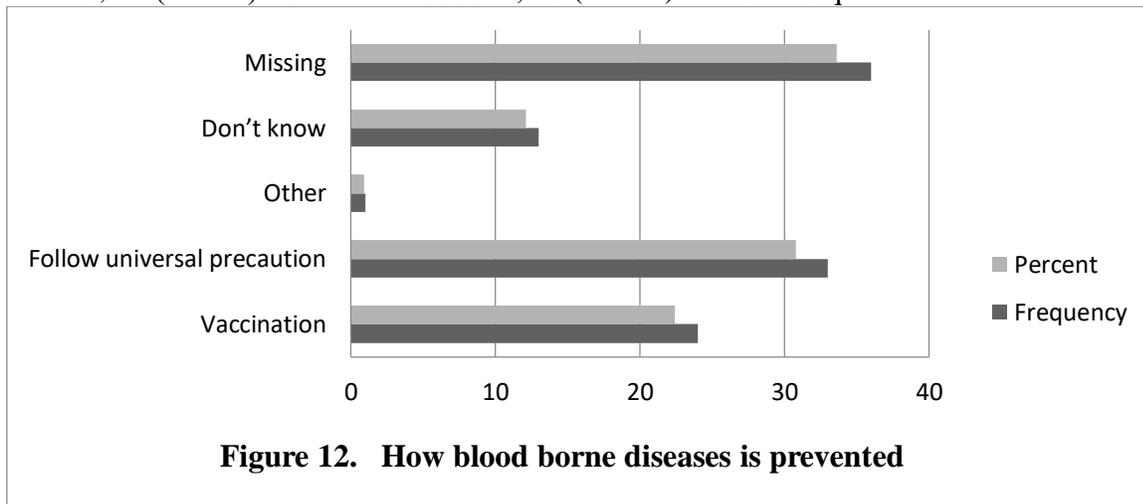
Only 2 (1.9%) answered that their work has no risk of exposure of contracting blood borne infection, 30 (28.0%) answered that has low risk of exposure, 62 (57.9%) answered that has high risk of exposure, 13 (12.1%) don't know about its exposure.



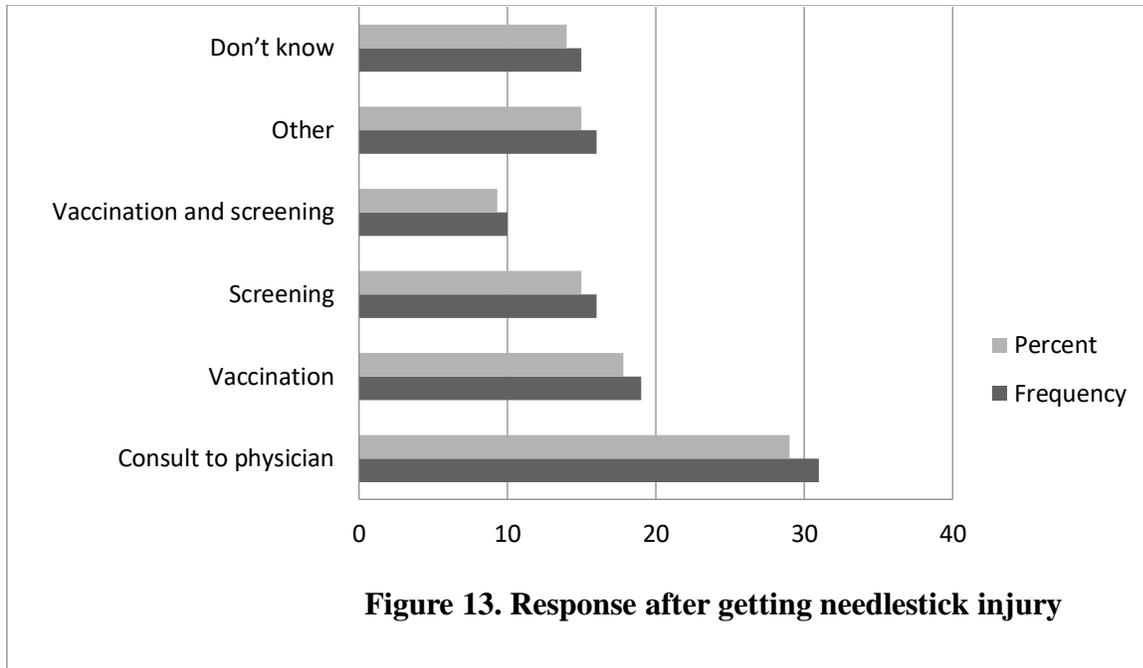
21 (19.6%) answered that Hepatitis B is preventable. 2 (1.9%) answered that Hepatitis C is preventable, 3 (2.8%) answered about AIDS, 8 (7.5%) answered that Hepatitis B and C both are preventable, 34 (31.8%) answered that all blood borne diseases is preventable, 39 (36.4%) don't about it.



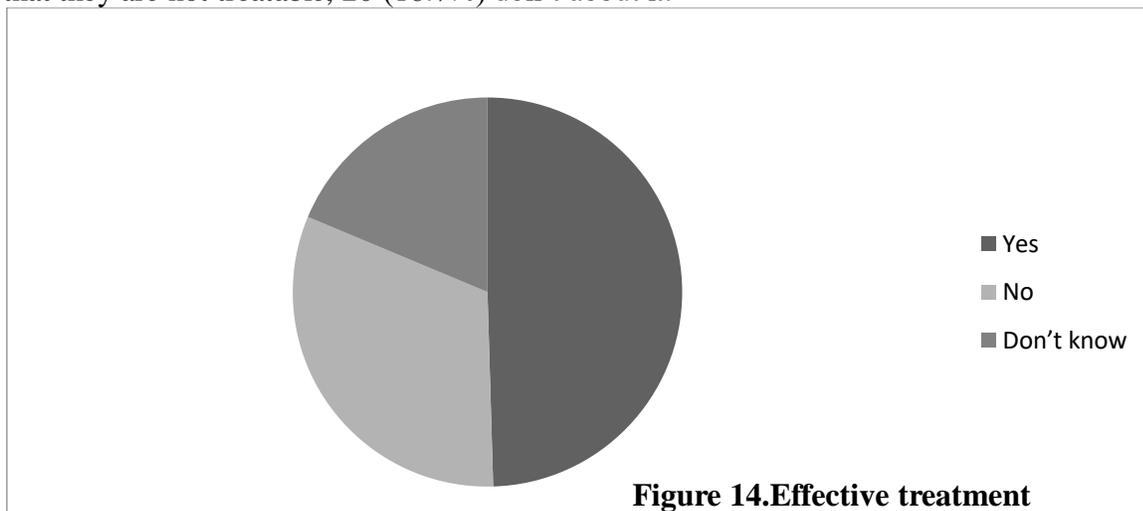
24 (22.4%) answered that these diseases are prevented through vaccination, 33 (30.8%) answered that follow universal precaution can prevent these diseases, 1 (.9%) answer other method, 13 (12.1%) don't know about it, 36 (33.6%) missed the question.



After getting needle stick injury, 31 (29.0%) answered that they consult to physician, 19 (17.8%) answered they vaccinate themselves, 16 (15%) answered for screening, 10 (9.3%) answered both for vaccination and screening, 16 (15.0%) said other methods and 15 (14.0%) don't know about it.



53(49.5%) answered that blood borne diseases have effective treatment, 34 (31.8%) answered that they are not treatable, 20 (18.7%) don't about it.



CORRECT ANSWERS:

**Table 4.**

CATEGORY	FREQUENCY	PERCENT
Don't know	13	12.1
Satisfactory	20	18.7
Good	63	58.9
Excellent	11	10.3
Total	107	100

## **DISCUSSION:**

Blood borne pathogens are microorganisms such as viruses or bacteria that are carried in blood and can cause disease in people. There are many different blood borne pathogens, including malaria, syphilis, and brucellosis, and most notably Hepatitis B (HBV), Hepatitis C (HCV) and the Human Immunodeficiency Virus (HIV). It is important to know the ways exposure and transmission are most likely to occur in particular situation, like nurses providing first aid to a patient in the casualty ward, handling blood samples in the laboratory, or cleaning up blood from a hallway etc. Health care workers, emergency response and public safety personnel, and other workers can be exposed to blood through needle stick and other sharps injuries, mucous membrane, and skin exposures. But nurses are more important in this situation because nurses are the main force which comes in contact with patients on routine basis. Some of those patients might have blood borne diseases like HIV, Hepatitis B & C etc which will be easily transfer to these nurses. These infections are major threats to health care workers specially nurses. Knowledge about Hepatitis B, C and AIDS is crucial for health care workers because of increasing incidence of these infections.

In this Study About 90% nurses know about the term blood borne disease and only 10% don't know about this term. Only 28% nurses know about the risk factors of getting these infections which is very disastrous. Our findings are similar to those found in national and international reports. <sup>(22)</sup>

Many of them said Hepatitis C is more common in Pakistan. And about the transmission other than blood. More than 60 percent knows that health care workers are more susceptible to getting these deadly infections a finding that is comparable with some Egyptian studies. <sup>(23)</sup>

There is no vaccine available for prevention of hepatitis C and AIDS. Still 22.4 percent claimed the availability of a vaccine that can protect against hepatitis C and AIDS.

Vaccination against HBV is important for healthcare providers. In the current study, more than 30% nurses do not know about HBV vaccinations in contrast to a lower percentage (20%) of nurses in a similar study from Palestine. <sup>(24)</sup> This reflects poor national hospital policies to implement compulsory vaccination for employed nurses to prevent them from being infected by

Blood borne pathogens. As we are aware of the dangers of contaminated needles and the deadly diseases they can transmit. In our study less than 40% nurses knew about needle safety despite the fact that needle pricks are one of the significant modes of transmitting hepatitis B and C in the world. In contrast to studies conducted by Labrangue LJ, Rheajane AR, Tizon MM. where this ratio is much higher 85%.<sup>(25)</sup> Nurses often sustain needle stick and sharp object injuries during clinical practice as is evident from other studies. Efforts are needed to correct unacceptable nurses' performance, especially when mismatch between knowledge and practice is witnessed. In the current study, there was no significant correlation between knowledge and practice. However, a statistically significant positive correlation was found between knowledge and practice in the other studies<sup>(26-39)</sup>, findings that reflect better performance of nurses on the basis of their knowledge. This contradictory finding might be explained by the lack of adherence to IC practices because of the absence of supervision and corrective actions.

## **Conclusion**

Both the knowledge and the practices of nurses working in the selected Ayub teaching Hospital in terms of Blood borne diseases measures were fair. In our study about 70% of nurses have reasonable knowledge about blood borne infections. But 30% have inadequate knowledge about these infections. Some nurses in hospital refused to participate in the study because of their fear of situation assessment; an attitude that needs to assure a patient and healthcare workers safety. They have no knowledge of the mode of transmission of these viruses. Their source, risk factors, vaccination and treatment. There is a great risk of getting blood borne infections by these nurses from the infected patients.

## **Recommendation**

Healthcare facilities should focus on increasing nurses' awareness for strict adherence to Infection Control standards, and implement training and preventive programs to minimize the risk of needle-stick injuries. All nurses should be vaccinated against HBV. It is recommended to implement educational, highly structured informative in service programs aiming at Nurses education about blood borne infections. This should be followed by post-training evaluations to assess the outcome and level of practice of Healthcare Workers on the basis of their knowledge before and after the

training intervention. All Healthcare workers should be encouraged to seek vaccination against HBV to reduce the risk of its sequel recommendations.

## References:

1. Occupational Safety & Health Administration. Blood-borne pathogens and needlestick prevention. Available at: <https://www.osha.gov/SLTC/bloodbornepathogens/index.html>. [Accessed 10 December 2018].
2. Maltezou HC, Maragos A, Raftopoulos V, Karageorgou K, Halharapi T, Remoudaki H, et al. Strategies to increase influenza vaccine uptake among health care workers in Greece. *Scand J Infect Dis* 2008; 40:266–268.
3. Bagheri Nejad S, Allegranzi B, Syed SB, Ellis B, Pittet D. Healthcare associated infection in Africa: a systematic review. *Bull World Health Organ* 2011; 89:757–765.
4. World Health Organization [WHO]. The first global patient safety challenge: ‘Clean care is safer care’. Geneva, Switzerland: WHO. Available at: <http://www.who.int/gpsc/background/en/index.html>. [Accessed 12 December 2018].
5. El-Zanaty F, Way A. Egypt demographic and health survey 2008 Egyptian: Ministry of Health. Cairo, Egypt: El-Zanaty and Associates, and Macro International; 2009.
6. Kane A, Lloyd J, Zaffran M, Simonsen L, Kane M. Transmission of hepatitis B, hepatitis C and human immunodeficiency viruses through unsafe injections in the developing world: model-based regional estimates. *Bull World Health Organ* 1999; 77:801–807.
7. Ahmad K. Hepatitis B in: *Viral Hepatitis: An overview: proceedings of seminar, AFIP Rawalpindi, Pakistan* 1998;16
8. World Health Organization. The World Health Report, Box 44. Geneva, Switzerland: World Health Organization; 2002. 25 Available at: <http://www.who.int/whr/2002/chapter4/en/index8.html>. [Accessed 25 January 2019].
9. Shriyan A, Annamma RR. Incidence of occupational exposures in a tertiary healthcare centre. *Indian J Sex Transm Dis* 2008; 33:26–30.

10. Boualle`gue O, Naija W, Said H, Nouria A, Jaidane N, Dhidah L, Boujaafar N. P233: incidence of ICU acquired nosocomial infections in University Hospital of Sahloul (Sousse-Tunisia). *Antimicrob Resist and Infect Control* 2013;2 (Suppl 1):P233.
11. Cole M. Infection control: world's apart primary and secondary care. *Br J Community Nurs* 2007; 12:301.
12. World Health Organization (WHO). Reducing risks, promoting healthy life 2 World Health Report World Health Organization 1211 Geneva 27. Geneva, Switzerland: WHO; 2002.
13. Garner JS. Guideline for isolation precautions in hospitals. The hospital infection control practices advisory committee. *Infect Control Hosp Epidemiol* 1996; 17:53–80.
14. Siegel JD, Rhinehart E, Jackson M, Chiarello L. the Healthcare Infection Control Practices Advisory Committee, 2007. Guideline for isolation precautions: preventing transmission of infectious agents in healthcare settings. Available at: <http://www.cdc.gov/ncidod/dhqp/pdf/isolation2007.pdf>.
15. Stein AD, Makarawo TP, Ahmad MF. A survey of doctors' and nurses' knowledge, attitudes and compliance with infection control guidelines in Birmingham teaching hospitals. *J Hosp Infect* 2003; 54:68–73.
16. Hanafi MI, Mohamed AM, Kassem MS, Shawki M. Needlestick injuries among health care workers of University of Alexandria Hospitals. *East Mediterr Health J* 2011; 17:26–35.
17. Abou El-Enein NY, El Mahdy HM. Standard precautions: a KAP study among nurses in the dialysis unit in a University Hospital in Alexandria, Egypt. *J Egypt Public Health Assoc* 2011; 86:3–10.
18. Eskander HG, Youssef W, Morsy M, Elfeky HA. Intensive care nurses' knowledge & practices regarding infection control standard precautions at a selected Egyptian Cancer Hospital. *J Educ Pract* 2013; 4:160–174.
19. Ismail NA, Aboul Ftouh AM, El Shoubary WH. Safe injection practice among healthcare workers, Gharbiya, Egypt. *J Egypt Public Health Assoc* 2005;80:563–583.
20. Gounden YP, Moodley J. Exposure to human deficiency virus among healthcare workers in South Africa. *Int J Gynaecol Obstet* 2000; 69:265–270.
21. Mujeeb SA. Unsafe injections: a potential source of HCV spread in Pakistan. *J Pak MED Assoc* 2001; 51: 1-3.

22. Johnson OE, Asuzu MC, Adebisi AD. Knowledge and practice of universal precautions among professionals in public and private health facilities in Uyo, Southern Nigeria: a comparative study. *Ibom Med J* 2013; 6:9–19.
23. Vaz K, McGrowder D, Alexander-Lindo R, Gordon L, Brown P, Irving R. Knowledge, awareness and compliance with universal precautions among health care workers at the University Hospital of the West Indies, Jamaica. *Int J Occup Environ Med* 2010; 1:171–181.
24. Fashafsheh I, Ayed A, Eqtait F, Harazneh L. Knowledge and practice of nursing staff towards infection control measures in the Palestinian Hospitals. *J Educ Pract* 2015; 6:79–90.
25. Labrangue LJ, Rheajane AR, Tizon MM. Knowledge of and compliance with standard precautions among student nurses. *IJANS* 2010; 1:84–97.
26. Qayyum S, Sattar A, Waqas B. Hospital acquired infections: knowledge about it and its prevention. *Professional Med J* 2010; 17:168–173.
27. Abdulraheem IS, Amodu MO, Saka MJ, Bolarinwa OA, Uthman MMB. Knowledge, awareness and compliance with standard precautions among health workers in North Eastern Nigeria. *J Community Med Health Edu* 2012; 2:131.
28. Isara AR, Ofili AN. Knowledge and practice of standard precautions among healthcare workers in the Federal Medical Centre, Asaba, Delta State, Nigeria. *Niger Postgrad Med J* 2010; 17:204–209.
29. Talaat E, Shamia E. Developing a control action plan for infection prevention at the endoscopy unit. *J Int Acad Res* 2010; 2:412–420.
30. Uti OG, Agbelusi GA, Jeboda SO, Ogunbodede E. Infection control knowledge and practices related to HIV among Nigerian dentists. *J Infect Dev Ctries* 2009; 3:604–610.
31. Agaral M, Thomas P. Prevalence of post op nosocomial infection in neuro surgical patients and associated risk factors—a prospective study. *NJI* 2003;107:620–625.
32. Galal YS, Labib JR, Abouelhamd WA. Impact of an infection-control program on nurses' knowledge and attitude in pediatric intensive care units at Cairo University hospitals. *J Egypt Public Health Assoc* 2014; 89:22–28.
33. Elhoseeny TA, Mourad JK. Assessment of the safety of injection practices and injection-related procedures in family health units and centers in Alexandria. *J Egypt Public Health Assoc* 2014; 89:66–73.

34. Kim PW, Roghmann MC, Perencevich EN, Harris AD. Rates of hand disinfection associated with glove use, patient isolation, and changes between exposure to various body sites. *Am J Infect Control* 2003; 31:97–103.
35. Gould D. Nurses' hand decontamination practice: results of a local study. *J Hosp Infect* 1994; 28:15–30.
36. Mahmud N, Abdul Sahib S. Assessment of nurses' practices toward infection control standardized precautions in Azady Teaching hospital in the city of Kirkuk. *Iraqi National J for Nursing Specialties* 2011; 24:52–58.
37. Hamid MZ, Aziz NA, Anita AR, Norlijah O. Knowledge of blood-borne infectious diseases and the practice of universal precautions amongst healthcare workers in a tertiary hospital in Malaysia. *Southeast Asian J Tropm Med Public Health* 2010; 41:1192–1199.
38. Gijare M. Effectiveness of teaching on infection control practices among health care professionals. *Sinhgad e J Nursing* 2012; 2:5–9.
39. Ndikom CM, Onibokun A. Knowledge and behavior of nurses/midwives in the prevention of vertical transmission of HIV in Owerri, Imo, Nigeria: a cross sectional study. *J Biomed Cent Nursing* 2007; 1:1–9.

**APPENDICES:**

**Questions to Know the level of knowledge about blood borne diseases in nurses working in tertiary care hospital**

Name: \_\_\_\_\_ Gender: M  F

Age: \_\_\_\_\_ Qualification:  M  F

Date: \_\_\_\_ / \_\_\_\_ /2019.

1. Do you know about blood borne diseases?
  - a) Yes
  - b) No
  
2. If Yes, Name blood borne diseases?
 

\_\_\_\_\_
  
3. What is the causative agent of above mention diseases?
 

\_\_\_\_\_
  
4. What is the most common among these diseases?
 

\_\_\_\_\_
  
5. Is there any other way of transmission of these diseases beside blood?
 

\_\_\_\_\_

6. Which of following are more susceptible to blood borne diseases?  
a) Driver b) Nurses c) Sweeper d) All

7. What are risk factor of blood borne disease are

- a) Excessive handling of contaminated needles
- b) Unsafe practice
- c) Unnecessary injection
- d) Reuse
- e) All of them

8. Are these diseases preventable?  
a) Yes b) No

9. If yes, what is most effective method to prevent these diseases?

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10. Are gloves required during phlebotomy procedures?  
a) Yes b) No

11. Are vaccines available for these diseases?  
a) Yes b) No

12. If yes, mention the vaccines?

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13. What is your response when you get Needle stick injury?

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14. Is blood borne diseases treatable?  
a) Yes b) No

15. How much you think your work expose you to risk of contracting blood borne infection?  
a) No risk of exposure b) low risk of exposure  
c) high risk of exposure

**Result:**

Correct answer 1 to 3 = poor  
3 to 7= Satisfactory  
7 to 10 = Good  
Above 10= Excellent