

Level of knowledge about blood Borne disease in nurses working in tertiary care hospital

Abstract

Background: 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, 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 a mean of 30.14. 57(53.3%) nurses are diplomate, 10(9.3%) are graduate, 40(37.4%) are undergraduates. The 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%) knew about the name and causative agents of blood-borne diseases, 13(12.1%) wrongly answered, 1(.9%) did not know about it, and 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 the 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 home 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 the satisfactory category, 58.9% are in good and 10.3% are in the 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 of 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.

Keyword: Blood borne diseases · Blood-borne pathogens · Infection control · Knowledge · Nurses · Practice

Received: 3-Nov-2022, Manuscript No. fmci-22-75967; **Editor assigned:** 6-Nov-2022, PreQC No fmci-22-75967 (PQ); **Reviewed:** 21-Nov-2022, QC No. fmci-22-75967 (Q); **Revised:** 27-Nov-2022, Manuscript no. fmci-22-75967 (R); **Published:** 30-Nov-2022; DOI: 10.37532/2041-6792.2022.12(11).229-238.

Introduction

Blood-Borne Pathogens (BBP) are microorganisms that cause infections in humans through the bloodstream. 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 [1]. 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 [2].

Nosocomial infection or Hospital-Acquired Infection (HAI) refers to an infection that is acquired during the process of care and not manifested at the time of admission to a hospital or other healthcare facility [3]. It has been estimated

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that the risk of Hospital Acquired Infection is 2 times-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 [4].

There have been several reports of healthcare 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 results of occupational exposure among Healthcare workers. The first report of HIV transmitted to an HCW as a result of an NSI was published in 1984 [5]. 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. (5) It is estimated that, in the year 2000, 16,000 HCV, 66,000 HBV, and 1000 HIV infections may have occurred worldwide among Healthcare Workers (HCWs). Globally, out of 39.5 million healthcare workers three million experience exposure to infectious diseases each year and 40% of hepatitis B, and C, and 2.5% of HIV/AIDS in Health care workers [6]. A study was conducted in the USA in 2004 in which the incidence rate per hundred beds was 26.7% and a similar study was conducted in France in which the incidence rate per 100 beds was 8.9%. A study conducted in India showed the incidence rate per hundred beds was 46% and the prevalence ranged from 45% to 60%. Different studies show prevalence ranging from 45% to 80% in Pakistan. A study was conducted in northern districts of Pakistan in which HIV was not detected in the HCWs while the rate of prevalence of HCV and HBV was far less (0.8 % and 0.64 %, resp.) as compared to the general population (4.7%-38%) [7].

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 a 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 blood-borne diseases including exposure to a blood borne pathogen, unnecessary injections, and the non-using of gloves and masks can lead to such cases of blood-borne diseases in nurses [8].

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 the management of blood-borne pathogen infections in nurses including more systematic surveillance of occupationally acquired HIV, HBV, and HCV infections. We can also get an idea about the awareness and level of knowledge about blood-borne diseases in nurses working in tertiary care hospitals. By getting this idea we can implement further preventive measures to protect nurses and other healthcare workers from being infected by 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 [9].

This study aims 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 infections. To bring to the notice of health care authorities about knowledge of nurses regarding blood-borne diseases. Study results will show the situation of nurses at Ayub Teaching Hospital for further intervention.

Operational definition

The level of knowledge is assessed based on the following categories:

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

Those who answer 3-6 questions correctly are in the satisfactory category.

Those who answer 7-10 questions correctly are in a good category.

Those who answer the above 10 correctly are in the excellent category.

Literature Review

Exposure to blood in healthcare-associated infections is a serious problem that threatens both patients and healthcare workers, including nurses. Nurses need to have sufficient knowledge about blood-borne diseases and blood-borne pathogens. Getting an infection can result in serious morbidity and mortality. The acute infection leads to chronic infection in 60%-80% of cases, 20%-50% develop cirrhosis in 2 decades-3 decades, and 11%-50% will develop liver cancer [10]. Numerous international self-report studies describe poor precautionary measures among health care professionals, including nurses, concerning eye protection, needle recapping, appropriate glove use, handwashing before and after patient contact, use of face masks, and 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 the

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 [11].

In Poland 601 surgical nurses were surveyed with only 5% of respondents reporting foil compliance with all items and were highest for glove use (83%) and lowest for protective eyewear (9%) [12]. Kermode et al surveyed healthcare 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 [13]. 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 [14]. 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 [15].

Outbreaks of jaundice following injection campaigns in the 1940s and 1960s among nurses of Royal Air Force Hospital who received multiple immunizations 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 negative pressure is generated when the needle is removed [16].

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 [17].

Kemppainen, Dubbert, & McWilliams, in 1996 in the 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. 36% of nurses and 26% of students stated that they would refrain from caring for these patients [18].

Martin & Bedimo (2000) in the USA examined willingness to care for patients with HIV/AIDS, and 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. 24% of the sample reported that they had difficulty working in the same environment as a person with HIV [19].

A study was conducted on 306 nurses in Hong Kong and was found to have a deficit of 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 apply to patients with HIV and HBV only,” 84.6% replied “False.” Many investigators have reported the contribution of training and education to knowledge and compliance with hand hygiene and SPs. They have generally reported effects that are temporary and require constant reinforcement [20].

Material and Methods

A cross-sectional study of permanently employed nurses was conducted in Ayub teaching hospital Abbottabad within around 12 months. The total population of permanently employed nurses in Ayub teaching hospital was 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 an interview-based questionnaire which consists 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 is the 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 the morning and in the evening time by taking verbal consent. The nurses were informed about the study, and some of them refused to answer. The data entry and analysis were done in SPSS version 16.0.

Results

A total of 107 nurses participated with 91(85%) females and 16 (15%) males (Figure 1).

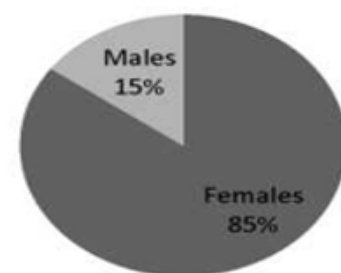


Figure 1. Gender of nurses.

The nurses are of different ages with a mean of 30.14, median of 30.00, mode of 22, and standard deviation of 7.655 (Table 1).

Table 1. Age of nurses.		
Age	Frequency	Percent
18	1	0.9
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	0.9
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	0.9
45	3	2.8
46	1	0.9
50	1	0.9
52	1	0.9
Total	107	100

57 (53.3%) nurses are diplomate, 10 (9.3%) are graduates, and 40 (37.4) are undergraduates (Figure 2).

■ Graduate ■ Undergraduate ■ Diplomate

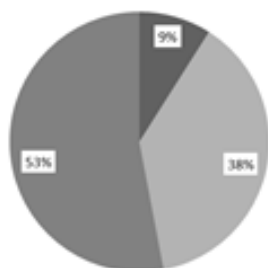


Figure 2: Qualification of Nurses.

The duration of nurses is different for different ages with a mean 8.170, median 5.00, mode 1.0, and standard deviation of 7.3978 (Table 2).

Table 2. Duration of service in years		
Duration	Frequency	Percent
0.1	1	0.9
0.3	2	1.9
1	14	13.1
2	8	7.5
2.5	1	0.9
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	0.9
17	1	0.9
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	0.9
33	1	0.9
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 registered, nursing officer (Figure 3) [9].

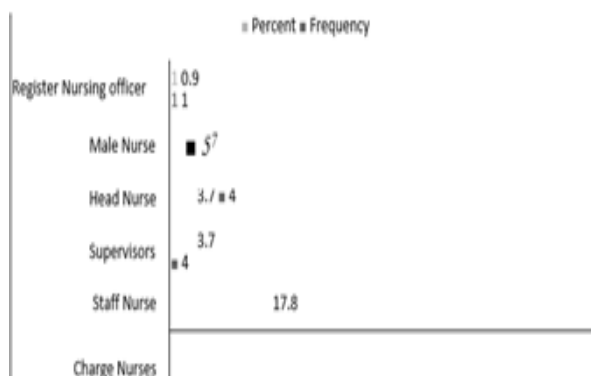


Figure 3: Designation of nurses

91 (85 correctly defined the term blood-borne disease, and 5 (4.7%) cannot be defined %) nurses (Figure 4). Correctly and 11 9 (10.3%) did it know about this definition.

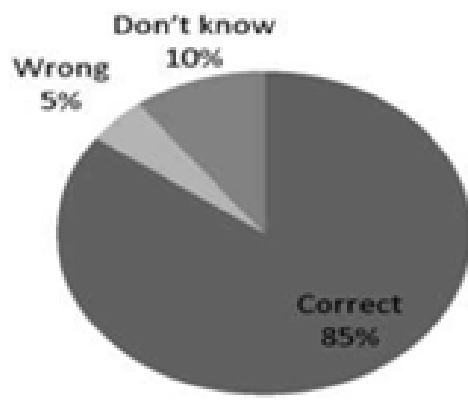


Figure 4: Definition of term blood born disease.

80 (74.8%) nurses knew 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 (Figure 5).

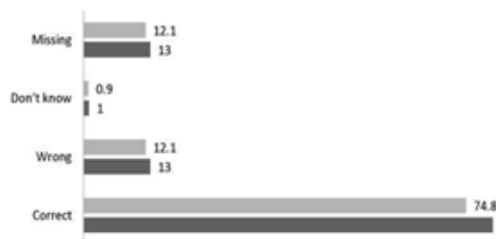


Figure 5: Name and the causative agent of a blood-borne disease

22 (20.6%) nurses correctly answered about the 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 the blood borne diseases (Figure 6).



Figure 6: Source of infection of blood-borne diseases.

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 the risk factors of these diseases (Table 3).

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

The 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 (Figure 7).

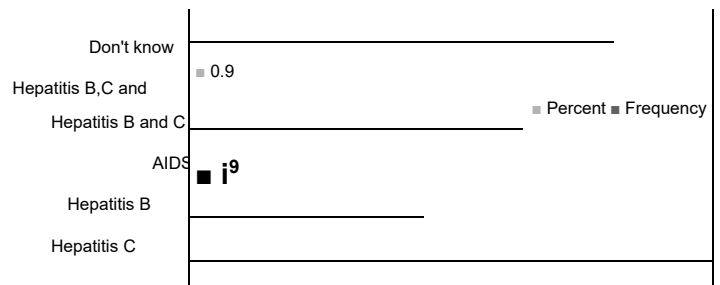


Figure 7: Most common blood-borne disease in Pakistan

66 (61.7%) answered that these diseases can be transmitted by blood. 22 (20.6%) answered that these diseases cannot be transmitted besides blood. 19 (17.8%) don't know about the transmission of these diseases besides blood (Figure 8).

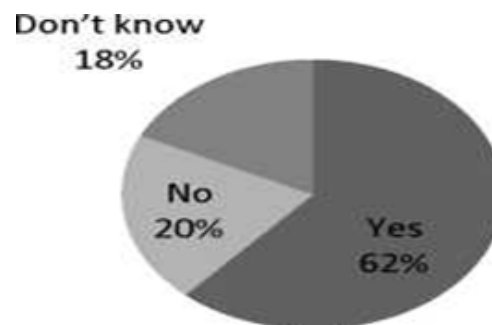


Figure 8: Another way of transmission of these diseases besides blood

66 (61.7%) answered that healthcare workers are more susceptible to blood-borne diseases, 25 (23.4%) don't know about the more susceptible person, 15 (14.0%) answered others are more susceptible than healthcare workers (Figure 9).

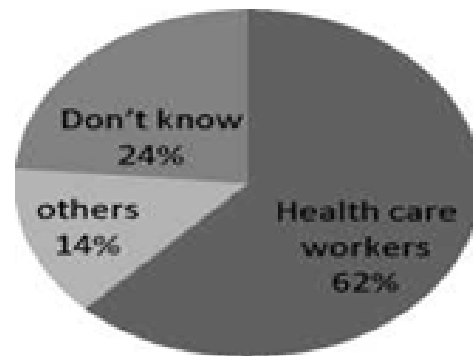


Figure 9: More susceptible persons

Only 2 (1.9%) answered that their work has no risk of exposure to contracting blood-borne infection, 30 (28.0%) answered that has a low risk of exposure, 62 (57.9%) answered that has a high risk of exposure, 13 (12.1%) don't know about its exposure (Figure 10).

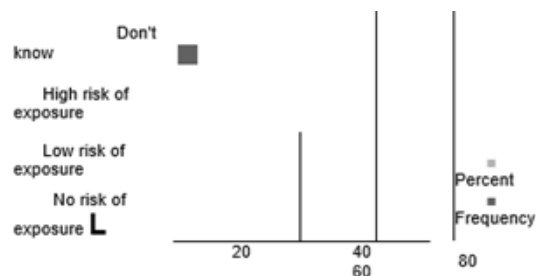


Figure 10: Work exposure

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 are preventable, 39 (36.4%) don't about it (Figure 11).

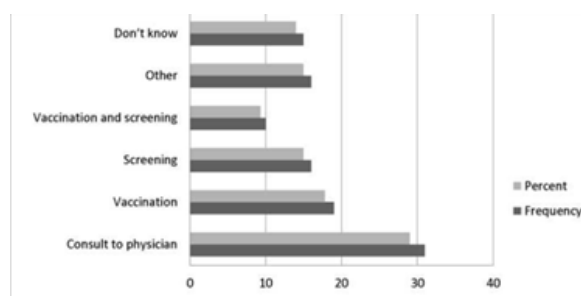


Figure 11: Response after getting needlestick injury.

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 (Figure 12) (Table 4).



Figure 12: Effective treatment.

Table 4. Correct Answers		
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

Bloodborne pathogens are microorganisms such as viruses or bacteria that are carried in the 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) [20]. It is important to know the ways exposure and transmission are most likely to occur in a particular situation, like nurses providing first aid to a patient in the casualty ward, handling blood samples in the laboratory, cleaning up blood from a hallway, etc. Healthcare workers, emergency response and public safety personnel, and other workers can be exposed to blood through needle sticks and other sharps injuries, mucous membranes, and skin exposures. But nurses are more important in this situation because nurses are the main force that comes in contact with patients on a routine basis. Some of those patients might have blood-borne diseases like HIV, Hepatitis B & C, etc which will be easily transferred to these nurses. These infections are major threats to healthcare workers specially nurses. Knowledge about Hepatitis B, C, and AIDS is crucial for healthcare workers because of the increasing incidence of these infections [21].

In this Study, About 90% of nurses know about the term blood-borne disease and only 10% don't know about this term. Only 28% of 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 [22].

Many of them said Hepatitis C is more common in Pakistan. And about the transmission other than blood. More than 60 percent know that healthcare workers are more susceptible to getting these deadly infections a finding that is comparable with some Egyptian studies [23]. There is no vaccine available for the prevention of hepatitis C and AIDS. Still, 22.4% 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% of nurses do not know about HBV vaccinations in contrast to a lower percentage (20%) of nurses in a similar study from Palestine [24]. This reflects poor national hospital policies to implement compulsory vaccination for employed nurses to prevent them from being infected by Bloodborne pathogens. As we are aware of the dangers of contaminated needles and the deadly diseases they can transmit. In our study, less than 40% of nurses knew about needle safety even though 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, and Tizon MM. where this ratio is much higher 85% [25]. 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 the 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' findings that reflect the better performance of nurses based on 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 [26-39].

Conclusion

Both the knowledge and the practices of nurses working in the selected Ayub teaching Hospital in

terms of Blood borne disease 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 the hospital refused to participate in the study because of their fear of situation assessment; an attitude that needs to assure patient and healthcare workers' safety. They do not know about the mode of transmission of these viruses. These sources, risk factors, vaccination, and treatment. There is a great risk of getting blood-borne infections from these nurses the infected patients.

Recommendation

Healthcare facilities should focus on increasing nurses' awareness of strict adherence to Infection Control standards and implement training and preventive programs to minimize the risk of needlestick 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 based on 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.

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