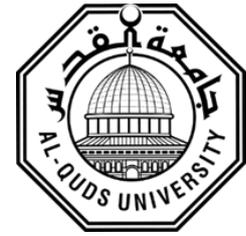**Deanship of Graduate Studies**
Al –Quds University

Health Care Providers' Compliance with the Infection Control Practices in Hemodialysis Units – Gaza Governorates

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MPH Thesis

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Health Care Providers' Compliance with the Infection Control Practices in Hemodialysis Units – Gaza Governorates

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Health Care Providers' Compliance with the Infection Control Practices in Hemodialysis Units – Gaza Governorates

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Dedication

To my mother and father to whom I owe my life and success
To my dear wife who has been a great source of motivation and
inspiration.
To my daughters and son for their encouraging smiles
To my brothers and sisters
To my friends
To my colleagues
And
To everyone who contributed to make this study a reality

Raid Naser Khaled Kashkash

Declaration

I certify that this thesis submitted for the degree of master is the result of my own research, except where otherwise acknowledged, and that this thesis or any of its parts has not been submitted for higher degree to any other university or institution.

Signed:

Date: /05/2017

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Raid Naser Khaled Kashkash

Abstract

Health care Associated Infections are the most frequent adverse event in health care delivery, which lead to significant mortality and financial loss for health systems. The overall aim of the study was to assess the health care providers' compliance with infection control practices in the hemodialysis units in order to decrease mortality and morbidity of both patients and health care providers in the Gaza Governorates. The design of this study is a cross sectional: quantitative and qualitative analytical design with census sample. The data were collected using four tools: well-structured self-administered questionnaire; observational checklist for health care providers practice; observational checklist for physical environment assessment; and focus group. In total, 77 questionnaires were collected, 228 practice observational checklists, 5 physical environment observational checklists, and one focus group. Findings of the study revealed that 85.7% of the study participants were males; the majority of study populations were married (93.5%); 24.7% were physicians and 75.3% were nurses. The study showed that the majority (91.88%) of the study participants agreed on the importance and necessity of Infection Prevention and Control protocol for the services provided in the hemodialysis unit. The majority of the study participants neither had adequate training (70.13%) nor had adequate knowledge (55.84%) about the Infection Prevention and Control protocol. The study findings revealed that hospital management does not efficiently exercising its role in encouraging health care providers to be compliant with Infection Prevention and Control protocol. The findings of the self-administered questionnaire showed that: the compliance with wearing uniform was 83.11%; hand washing score was 72.54%; wearing gloves score was 82.14%; using antiseptic and disinfectant score was 77.01%; and safe work practices 41.88% while the observed practices showed that: wearing uniform practices was 71.5%; hand washing was 52.24%; wearing gloves was 92.84%; using antiseptic and disinfectant was 67.11%; and safe work practices was 75.33%. Moreover, the study revealed that 55.8% of the health care providers were exposed to an injury from used needles or sharp medical instruments. Additionally, the study found that only 67.5% of the health care providers working in the hemodialysis unit received the recommended three doses of hepatitis B vaccine. Finally, the study showed that the study participants recognized insufficient time, lack of required supplies, lack of knowledge and education, lack of job satisfaction, inadequate training program and lack of updated information, lack of guidelines from colleagues and superior, absence of accountability and feedback from administration, and high workload as the main barriers for good compliance with Infection Prevention and Control protocol in the hemodialysis units. The above mentioned findings were consistent with that of the focus group. Additionally, it highlighted the presence of conflict in hepatitis B post vaccination testing and factors that hinder the establishment of national infection control protocol. There is a need to adopt a Palestinian Infection Prevention and Control protocol special for hemodialysis unit; to implement a continuous education and training programs for healthcare staff concerning Infection Prevention and Control protocol; to disseminate printed and softcopies copies of the Infection Prevention and Control protocol; to activate the monitoring role of auditing system to improve health care providers' compliance with Infection Prevention and Control protocol.

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List of Abbreviations

APIC	Association For Professionals In Infection Control And Epidemiology
BBV	Blood Borne Virus
CDC	Centers For Disease Control And Prevention
GG	Gaza Governorates
HCP's	Health Care Providers
HD	Hemodialysis
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HAI	Hospital Associated Infections
IC	Infection Control
IPC	Infection Prevention and Control
MoH	Ministry Of Health
MROs	Multi-Resistant Organisms
NGOs	Non-Governmental Organization
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
PCBS	Palestinian Central Bureau Of Statistics
PLO	Palestinian Liberation Organization
PNA	Palestinian National Authority
PHC	Primary Health Care
UNRWA	United Nations Relief and Works Agency for Palestine Refugees in the Near East
WB	West Bank Governorates
WHO	World Health Organization

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Chapter 1: Introduction

1.1 Background

Infection is the most common cause of hospitalization and the second most common cause of mortality among Hemodialysis (HD) patients after cardiovascular disease (CDC, 2016). Health care Associated Infections (HAIs) are the most frequent adverse event in health care delivery. Globally, hundreds of millions of patients are affected by health care associated infections each year, leading to significant mortality and financial loss for health systems (WHO, 2013).

Patients who undergo dialysis treatment have an increased risk for getting an infection (CDC, 2016). The increased risk of HAIs among HD patients are mainly due to: immune compromised status; frequent and prolonged blood exposure during HD treatments through the vascular access and extracorporeal circuit (with many ports and connections); close proximity to other patients during treatment in the HD facility; frequent contact with healthcare workers who frequently move between patients and between machines; frequent hospitalization and surgery; and most importantly and non-adherence or a break in implementation of recommended practices, including hand hygiene and use of personal protective equipment (Karkar, 2016).

Health Care Providers (HCP's) are at risk of exposure to blood borne pathogens, as HD patients can have a high prevalence of blood borne diseases (WHO, 2016). As a result of the increased risk of blood borne pathogens among HD patients and HCP, international guideline generating bodies created and implemented specific and strict infection prevention and control measures, in addition to the usual standard precautions. These recommendations included several specific infection prophylactic strategies for implementation in the HD settings.

According to the WHO (2016), infection prevention and control is a practical, evidence based approach preventing patients and health care workers from being harmed by avoidable infections. Effective IPC requires constant action at all levels of the health care system including policy makers, facility managers, health care workers, and those who access health care services (WHO, 2016).

According to the WHO (2016), infection control precautions must be integrated into the routine activities of the hospital; the management of these activities should be through a Hospital Infection Control Committee with a full time Infection Control Nurse who should coordinate various activities. The Committee should identify priorities, implement the plan and continuously monitor the situation for assuring quality and its continuous improvement (WHO, 2002). These precautions include hand hygiene, personal protective equipment, isolation precautions, aseptic techniques, cleaning and disinfection, sterilization, waste management, antibiotic use protocol, immunization and post exposure management (WHO, 2004).

In the year 2004, the first Palestinian Infection Prevention and Control (IPC) protocols was developed with technical and financial support of MARAM project. MARAM project aimed to protect the HCPs, clients, and the community initiative implemented at the primary health care centers in the Palestinian territories. This IPC protocol was approved by the Palestinian's Ministry of Health (MoH) after holding training courses for all of the MoH facilities in 2004. The protocol focused on the followings: hand hygiene; hand gloving; using protective barriers; using antiseptic agents; using safe work practices, including safe handling of needles and sharp instruments; safe waste disposal; prevent spread of infection to the community; processes instrument through cleaning; high level disinfecting; and use of relevant vaccinations (MoH, 2004).

In the year 2012, the Jordanian Infection Control guideline was adopted by MoH for implementation at the governmental hospitals. The guideline focused on the main issues of infection prevention and control practices such as hand hygiene, the use of personal protective barriers, the use of antiseptic, safe environment, waste management, and using disinfectant. In addition, it presented in details the infection control practices in various hospital units, including hemodialysis unit

As mentioned previously, we have to ensure that IPC protocols adopted by MoH are implemented in HD units in order to achieve the desired goals of IPC protocols implementation which include the improvement of the quality of health service provided to HD patients, as well as to improve the morbidity and mortality indicators of HD patients and to ensure that the HCPs have been fully trained on IPC protocols.

1.2 Problem Statement

Infection as a cause of hospitalization for HD patients has increased worldwide in recent years, it was reported as the second most common cause of death for HD patients, after cardiovascular disease (APIC, 2010).

According to Ottol and colleagues (2010), the sole study conducted at the HD units in Gaza Governorates (GG), there was high prevalence of blood borne pathogens, specifically Hepatitis B virus (HBV) and Hepatitis C virus (HCV) among hemodialysis patients. Ottol and colleagues (2010) concluded that the overall prevalence of HBV among HD patients was 8.1%, while it was 1.09% among healthy blood donors in the GG. Additionally, the overall prevalence of HCV among HD patients was 22%, while it was 0.14% among healthy blood donors in the GG (Ottol et al., 2010).

Standard Precautions (formerly Universal Precautions) need to be rigidly observed in the HD facility. These standards must be consistently performed to reduce the infection risk for HCP's and patients. According to General Administration of hospitals there is an infection control strategy circulated to all hospitals including HD units in the year 2012.

To the best of the researcher's knowledge, no previous research studies have been carried out concerning the health care staff compliance with the infection control practice in the HD units in GG. Thus, this study will evaluate the health care provider's compliance to the infection control practice in hemodialysis units in governmental hospitals in GG. This study will provide signals that could help identify best ways to promote safety measures for both the health care staff and patients and their relatives that could decrease the mortality and morbidity for both HD patients and the HCP's.

1.3 Justification of the Study

Healthcare associated infections represent the most life threatening and most frequent adverse event associated with patient care in the hospital (WHO, 2016). Globally, the Health care associated infections affect health care facilities and health systems. The prevalence rates are estimated at $15 - 31\%$ in low and middle income countries, whereas in the developed countries, the prevalence rates ranged from $5 - 15\%$ of hospitalized patients. An estimated five million hospital acquired infections occur in acute care hospitals in

Europe annually, contributing to 135,000 deaths per year and 25 million extra days of hospital stay with an economic burden of 13 - 24 billion Euros per year (Maingi, 2015).

Few studies were conducted in Gaza governorates hospitals to assess the compliance of HCP's to infection and prevention control protocol in different units (Awad, 2009; 2010; Eljedi and Dalo, 2014). Only one study was conducted to assess the prevalence of Hepatitis B virus (HBV) and hepatitis C virus (HCV) among hemodialysis patients in GG.

This study will help in reducing the burden on the Palestinian Ministry of Health; by detection of environmental infection risks, and evaluation of existing infection control practices in hemodialysis units at GG. Also, by improving the implementation of infection control measures in GG hospitals, it is expected to decrease the rate of infectious disease (hepatitis and HAIs) in hemodialysis units and to decrease the burden of infection on patients and health care providers.

1.4 Aim of the Study

This study aims to assess the health care providers' compliance with infection control practices in the HD units in order to decrease HD mortality and morbidity of both patients and HCP's in the GG.

1.5 Research Objectives

- To explore knowledge and attitude of the health care providers regarding the IPC protocols.
- To assess the infection control practices at the MoH HD units.
- To evaluate the physical environmental fitness of the HD units for implementation of Good IPC practice.
- To determine the barriers that hinders the compliance of health care providers with IPC protocols.
- To propose recommendations to improve health care providers' compliance with IPC protocols.

1.6 Research Questions

- What is the health care provider's level of attitude and knowledge about the Palestinian IPC protocol?

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- Do health care providers comply with the Palestinian IPC protocol?
- Is there any monitoring system for HD unit's infection?
- Are there periodic training about IPC for HCPs at the HD units?
- Do the current immunization program meet the standard?
- Is there any differences among different HD units in the compliance of HCPs with IPC protocol?
- To what extent the currents HD units' physical environment fits to the standard needs for the application of IPC protocol?
- What are the barriers that prevent the HCPs to comply with IPC protocol?
- What are the recommendations needed to enhance HCPs compliance with IPC protocol?

1.7 Context of the Study

This study will be conducted in governmental HD units in GG. Therefore, it is important to understand the demographic, socioeconomic, and Palestinian health care situations that greatly impact health and humanitarian organization working in the GG. This context influences the forming of Palestinian Health care features and their effects on Palestinian population.

1.7.1 Geographic Context:

Palestine (Annex 1) is located in the west of Asia; it lies between longitudes 33' 15" and 29' 30"; and between latitudes 35' 40" and 34' 15". The entire area of Palestine is about 27,009 Km2, stretching from Ras Al-Nakoura in the north to Ommerreshrash in the south. Palestine is bordered by Lebanon in the north with a border length of 79 Km; Syria with border length of 70 Km, and Jordan with a border length of 360 Km from the east. To the south, Palestine is bordered by Egypt with a total length of 240 Km border. Mediterranean Sea limits Palestine from the west with a coast length of 224 Km. Palestine also overlooks the Gulf of Aqaba with a coast length of 10.5 Km (Dabbagh, 1997). Nowadays, the Palestinian National Authority (PNA) is limited to two geographically separated areas, Gaza governorates (also called southern governorates, Gaza strip, GS), and West Bank governorates (also called northern governorates, WB), with a total area of 6020 km2 which represents 22% of historical state of Palestine (PCBS, 2013a).

GG (Annex 2) is a small narrow band of land; it is 45 km long and 6-12 km wide, located in the southern area of the historical state of Palestine on the coast of Mediterranean with an area of 365 km2 (Dabbagh, 1997). It is divided into five governorates: North Gaza, Gaza, Mid Zone, Khan Younis, and Rafah (PCBS, 2013a). The total land boundaries of GG are 62 Km: Egypt 11 Km, and Israel 51 Km (PCBS, 2014).

1.7.2 Demographic Context:

According to PCBS (2015), the total estimated population of the PNA at mid-2015 was about 4.68 million; 2.38 million males and 2.3 million females. The total estimated population of the GG was 1.82 million. Data revealed that the population of the PNA is a young population; as the percentage of individuals aged 0 to 14 constituted 39.4% of the total population at mid-2015, of which 37.2% are in WB and 43.0% in GG. The elderly population aged 65 years and over constituted 2.9% of the total population of which 3.2% are in WB and 2.4% in GG at mid-2015. Population density is generally high in GG; reaching 4,986 persons/km2, as per PCBS (2015). The average household size in PNA was 5.2 in 2014: 4.9 in WB and 5.7 in GG. The natural rate of increase of the population was 2.9% in 2015; 2.6% in WB and 3.4% in GG (PCBS, 2015).

In 2012, Palestinian refugees constituted 42.1% of the total population: 27.0% in WB and 67.0 % in GG. In 2015, life expectancy at birth in PNA was 73.5: 72 years for males and 75 years for females (PCBS, 2015).

1.7.3 Socioeconomic Context:

The ongoing blockade, current occupation, frequent wars have weakened the Palestinian economy to unprecedented level. In the year 2012, the estimated per capita GDP was 1679.3$: 2093.3$ in WB and 1074.5$ in GG (PCBS, 2013b).

Labor force participation rate in 2015 was 45.6%, distributed as 71.7% for males and 18.8% for females (PCBS, 2015). In 2015, Out of the total rate of employment: full employment rate was 70.8%, underemployment rate was 3.6%, and unemployment rate was 25.6% (PCBS, 2015). According to the United Nations Office for the Coordination of Humanitarian Affairs (OCHA,2014), the current poverty and unemployment rates are very high; In GG, unemployment rate has increased dramatically since mid-2013, following halt of the illegal tunnel trade with Egypt, soaring from 28% in the third quarter of 2013 to 45%

in the second quarter of 2014; almost 70% of the youth aged 20-24 were unemployed in GG in the second quarter of 2014 and further deterioration is highly expected (OCHA, 2014).

The total diffusion rate of poverty among Palestinian individuals was 25.8% in 2011: 17.8% in the WB and 38.8% in the GG. In 2014, the poverty rate in the GG has increased to 39% (World Bank, 2014). In 2014, the literacy rate was 96.9% in the GG (98.4% for males versus 95.3% for females) (PCBS, 2015).

1.7.4 Palestinian Health Care Context:

The Palestinian health care system is a complex one; it covers wide range of Primary Health Care (PHC), secondary health care, and tertiary health care. There are four main health care providers: MoH, United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA), Non-Governmental health Organizations (NGOs), and private for-profit health service providers (MoH, 2014). MoH is the main health care provider in PNA; it provides primary, secondary, and tertiary health care services. It purchases advanced medical services through referring patients to the neighboring countries and other private and NGOs health care facilities (MoH, 2014). UNRWA provides basic primary health care services and some secondary care services to the Palestinian refugees (MoH, 2014).

1.8 Political Context of GG

After the beginning of Al Aqsa intifada (2000), Israeli siege and closure of crossings was imposed on the GG. The Israeli authorities implemented a collective punishment to all Palestinians in the GG by tightening the siege more intensively after the Palestinian legislative elections in 2006 and the election of Hamas Islamic movement. Intensity of the sieges and continuous blockade of borders were dramatically increased after the political rift in 2007. Israel's punitive closure of the GG, particularly the near-total blocking of exports, continued to have severe consequences on the Palestinian population. The allowed imports to GG amounted to less than half of the 2006 pre-closure levels (Human Rights Watch, 2014). In 2013, deterioration of the health status has increased due to bad economic situation after the closure of the illegal tunnels with Egypt, which was considered in certain period of time as a sole source of all goods needed for GG. The MoH

became hardly able to provide all operational needs of the health services including drugs, medical disposables, medical equipment, lab materials, and others. Additionally, services are frequently interrupted by electricity blackouts and insufficient supplies of drugs and disposables and limited training opportunities for medical staff. This further threatens the health of the population, which is already at increasing risk (UNRWA, 2014; OCHA, 2014). Following the establishment of the reconciliation government, there is a void in local leadership at ministerial levels and insufficient cash flow causing an imminent threat of a breakdown in key public health services. This comes on top of an already severely strained situation caused by ten years of Israeli siege on GG (UNRWA, 2014).

Not only the political conflict led to deterioration in the health status in the GG, but also frequent and repeated Israeli wars and attacks, where GG were exposed to three major and devastating wars in the last 7 years: 2008, 2012, and 2014. As a result of the last Israeli 51days war on the GG in 2014, several health facilities had been closed throughout the hostilities. Some of them have been re-opened while others have not (OCHA, 2014). In GG, 50 PHCs and 17 hospitals were either partially or totally damaged (OCHA, 2014). During the last war, some of 485,000 people – 28% of GG population – were internally displaced (OCHA, 2014).

1.9 Palestinian Ministry of Health

After the Oslo Accords (1994) between the Israeli government and Palestinian Liberation Organization (PLO), PNA was established on the GG, in addition to Jericho city, which was known as the first phase of the Convention: Gaza-Jericho phase. Health care provision, supervision, regulation, licensure, and control of all health services were transferred to the Palestinian MoH in 1994 (Abed, 2007). Despite aid assistance by international donors, health sector has been suffering from chronic financial crises due to increased demand on health services which resulted from ongoing increase in the population growth, frequent wars, and political rift between GG and WB (Palestinian Non-Governmental Organizations Network, 2009; Abed, 2007).

The MoH is composed mainly of main general directorates including hospitals, primary health care, pharmacy, human resources development, health finance and management, inspection and control, international cooperation, engineering and maintenance, and legal affairs. It also includes many units such as insurance, nurses, laboratories and blood banks,

referral abroad, rehabilitation, health information center, Information and technology, strategic planning, psychiatric health, emergency services, and accreditation and licensing. Hospitals are a key component for effective performance of the Palestinian health care system (MoH, 2013).

1.10 Health Indicators

In 2015, the crude birth rate was 31.9 per 1000 population (29 in WB, and 36.3 in GG) and the crude death rate was 3.6 per 1000 population (3.7 in WB, and 3.4 in GG) (PCBS, 2015).

The overall number of hospital beds in PNA is 5,414 beds distributed over 79 hospitals; 49 are in WB with 3,163 beds hospital beds, 30 hospitals with 2,251 beds in GG (MoH, 2013). In the year 2012, Bed occupancy rate was 82.7% with an average of 2.4 days residency in hospital (PCBS, 2013b).

1.11 Governmental Hospitals in GG

In GG, there are 12 governmental hospitals, the total number of governmental hospital beds in 2015 was 1639 for inpatients. Bed occupancy rate was 84.43% with an average of 3.89 days residency in hospital (MoH, 2015). HD service is provided in the GG only by five governmental hospitals: Al Shifa hospital, Nasser hospital, Al Aqsa, Abu-Yousef El Najjar, and Al Rantisi, the total number of patients who receive dialysis service regularly were 557 patients in 2014. The number of dialysis sessions in 2014 was 68,751. The HD units contained 104 dialysis machines where 23 of them need maintenance and spare parts, see annexes (3&4) (PHIC, 2015).

1.12 Definition of Terms

Compliance: It is defined as the extent to which the patients, behavior matches the prescriber's recommendations. However, its use is declining as it implies lack of patient involvement (Horne et al., 2005).

Dialysis: is a procedure that replaces the normal functions of the kidney by removing metabolic waste products through diffusion and hydraulic pressure gradients. The use of an artificial semipermeable membrane (hemodialyzer) or a natural semipermeable membrane (peritoneum) allows passage of some molecules while passage of other molecules is

restricted. Molecules that can move through the membrane move from the area of higher concentration to the area of lower concentration. The dialysate is a combination of treated water and electrolyte concentrates used with the dialysis machine and system.

Health Care Provider: Any person delivering care to a client/patient/resident. This includes, but is not limited to, the following: emergency service workers, physicians, dentists, nurses, respiratory therapists and other health professionals, personal support workers, clinical instructors, students and home health care workers (CARE, 2010).

Infection: It is defined as the transmission of microorganisms into a host after evading defense mechanisms, resulting in the organism's proliferation and invasion within the host tissues (CDC, 2013).

Infection Prevention and Control: Evidence-based practices and procedures that, when applied consistently in health care settings, can prevent or reduce the risk of transmission of microorganisms to health care providers, other clients, patients, residents and visitors (CARE, 2010).

Nosocomial Infection or HAIs: Hospital Associated Infections (HAI) or nosocomial infections are those infections that were neither present nor incubating at the time the patient was admitted to the health care facility. The majority of HAI become evident 48 hours or more following admission. However, it may not become clinically evident until after discharge (WHO, 2006).

Protocol: a formal set of rules and procedures to be followed during a particular research experiment, course of treatment, etc.

Personal Protective Equipment (PPE): Clothing or equipment worn for protection against hazards (CARE, 2010).

Chapter 2: Conceptual Framework and Literature Review

This chapter starts by presenting the conceptual framework guiding this study; and clarifies the main factors that affect health care providers' compliance with the Palestinian infection prevention and control protocol. Then it highlights the concept of infection prevention and control, hospital associated infection, infection control precautions for HD unit, assessment of the compliance to infection prevention and control, barriers that prevent HCPs to comply with the IPC protocol, education and training program, and the knowledge and practices of IPC protocol. Finally, it reviews sharp disposal practice.

2.1 Conceptual Framework

The researcher developed the study conceptual framework in order to guides the research process, to organize the work, and to make the research findings valuable and meaningful. The conceptual framework as shown in Fig. (2.1) addressed the main domains of the study which was identified in accordance with those addressed in similar studies globally which are known to affect the infection prevention and control practices at the hemodialysis units. These three domains firstly included the individual elements, secondly the structural and managerial element, and finally the environmental infection control measures.

The first domain is called the individual elements, which consists of two variables: the health care provider's knowledge, attitude and the health care provider's IPC practices. The second domain is called the structural and managerial elements, which consists of several variables: the local & national IPC protocol and policies, and the adopted and implemented training programs, and the current identified barriers in the local context that hinder the healthcare provider's adherence to IPC protocols. The Third domain is called the environmental infection control elements, which focused on the availability of the needed supplies, materials, equipment, and antiseptics needed for good IPC and medical waste disposal practice in the HD units.
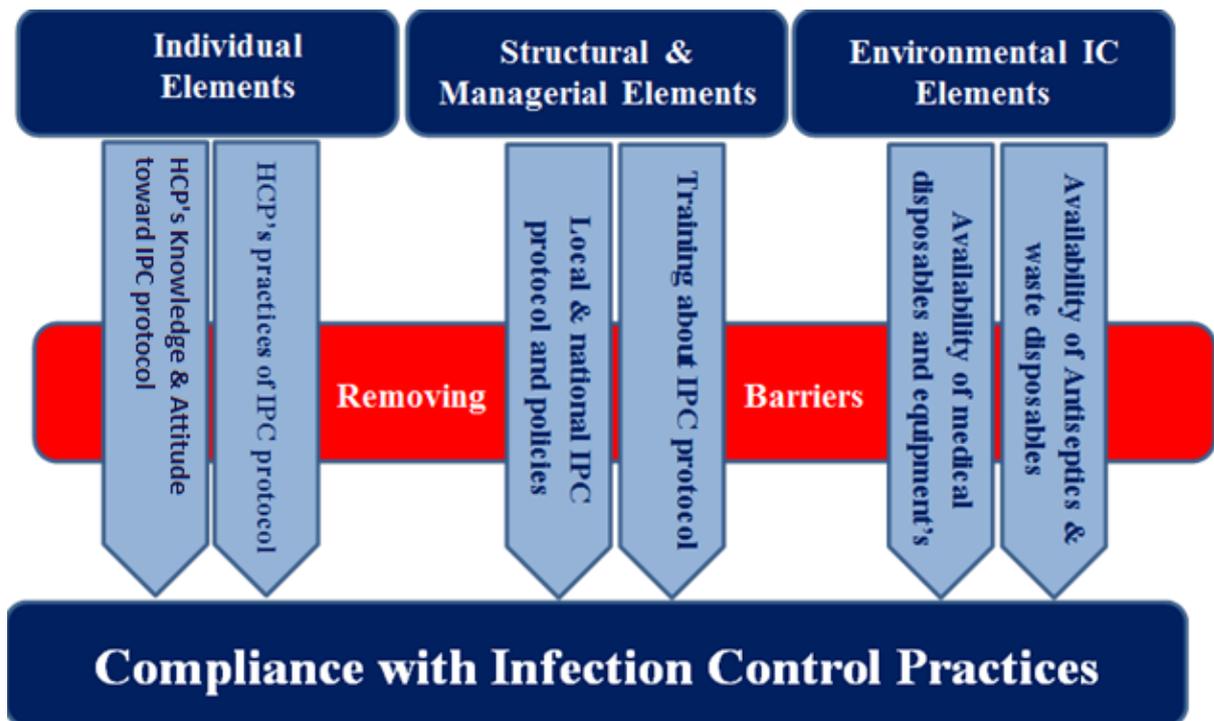
Figure 2.1: Conceptual Framework

2.2 Literature Review

2.2.1 Infection Prevention and Control:

Infection is caused by microscopic organisms - bacterial, fungal, viral, or parasitic that penetrate the body's natural barriers and multiply to create symptoms that can range from mild to deadly. The infectivity depends on the virulence of infectious agents, the number of organisms in the infecting inoculum and the response of the immune system (Infectious Diseases Society of America, 2003).

Infection prevention and control is a practical, evidence-based approach preventing patients and health care workers from being harmed by avoidable infections. Effective IPC requires constant action at all levels of the health care system including policy-makers, facility managers, health care workers, and those who access health care services (WHO, 2016).

IPC concept is unique in the field of patient safety and quality of health care, as it is universally relevant to health care workers and patients in the same time at any step of health care interaction in between them. The implementation of IPC best practices leads to

significant reductions in the likelihood of HAIs incidents and patient harm. Best results of the IPC related indicators are achieved when IPC practice concept is supported by political and management level and when it is integrated within the clinical services, and when the patient safety culture is strong and favorable among all levels of the health care system. Defective IPC practice causes harm to both the health care providers and patients and even can be fatal. Without effective IPC practice it is impossible to achieve quality health care delivery (WHO, 2016).

Millennium Development Goals (MDGs) Identified among the goals: deals with reducing childhood mortality, and combat HIV/AIDS, malaria and other infectious dangerous diseases (United Nations, 2010).

According to the WHO (2016), the implementation of effective IPC program leads to more than 30% reduction in HAI incidence rates. Moreover, as a result of the implementation of strong IPC plans across the USA between 2008 and 2014, a significant reduction in the number of central line associated bloodstream infections by 50%, and a reduction by 17% in the incidents of surgical site infections was reported (WHO, 2016).

2.2.2 Health Care Associated Infection:

Health care associated infection (also referred to as "nosocomial infections" or "hospital acquired infections") is an infection occurring in a patient during the process of receiving health care services in a hospital or other health care facility which was not present or incubating in the patient at the time of admission to hospital. Health care associated infections can also appear in patients after their discharge from the hospital. Health care associated infections represent the most life threatening and most frequent adverse event associated with patient care in the hospital. HAIs indicators for patients receiving care in a health care facility represents a clear direct indication of the quality and safety measures of the current services provided. HAIs are mostly caused by microorganisms resistant to one or more of the commonly used antibiotics in the health care facility (also called multi drug resistant microorganisms). Common HAIs include urinary tract infections, chest infections, blood infections, and wound infections (WHO, 2016).

Each year, hundreds of millions of patients are affected by HAIs, this problem usually receives public attention only when there is an outbreak or epidemic. However, it is often hidden from public attention as that of the endemics. Nevertheless, it is an ongoing

problem and it is very real and no health institution or country can ignore HAIs because it can cause preventable death, result in a human and economic increased burden of disease, prolong hospital stays, create long term disability, increase the burden of antimicrobial resistance. Without regular HAI surveillance, as part of an IPC program, to recognize the burden locally and nationally in order to prioritize action, it is impossible to provide safe and quality health care services (WHO, 2016).

Healthcare associated infections affect health care facilities and health systems globally. Prevalence rates are estimated at 15 – 31% in low and middle income countries, whereas in developed countries the prevalence rates range from 5 – 15% of hospitalized patients. An estimated five million hospital acquired infections occur in acute care hospitals in Europe annually contributing to 135,000 deaths per year and 25 million extra days of hospital stay with an economic burden of 13 - 24 billion Euros per year (Maingi, 2015).

According to the WHO (2002), the development of surveillance system is an essential step to identify local problems and priorities. Surveillance system is fundamental to evaluate the effectiveness of infection prevention and control activities. Additionally, surveillance system is an effective process to decrease the frequency of hospital acquired infections. Moreover, the prevention of nosocomial infections is the responsibility of all individuals working in the provision of health care services. Furthermore, all are considered as partners and must work cooperatively to reduce the risk of infections for patients and health care staff simultaneously. Those partners includes personnel providing direct patient care, management, physical plant, provision of materials and products, and training of health workers (WHO, 2002).

An Indian study conducted to identify the pattern of nosocomial infections and their prevalence in intensive care unit, it showed that the infection rate of at the intensive care unit was 16.13%. Among all cases the commonest was cases that had urinary tract infections (41.43%), followed by cases that had respiratory tract infection (31.43%), followed by cases that had dual infections of respiratory and urinary tract (17.13%). The rest of cases were having infections of surgical site and blood stream infection. Debnath and Choudhury (2016) concluded that the relatively lesser rate of nosocomial infection reported in the intensive care unit compared to national or international indicators might be due to better practice of using antiseptic and good compliance with aseptic precautions (Debnath & Choudhury, 2016).

Another study conducted by Chakraborty and Mukherjee (2016) to determine the prevalence of nosocomial infections in the intensive care unit a tertiary care hospital in Eastern India; the study found that the prevalence of nosocomial infections in intensive care unit was 24.3% (Chakraborty & Mukherjee, 2016).

Ahoyo and colleagues (2014) conducted a study to estimate the prevalence of nosocomial infections in among the hospitals of the African country called Benin; it showed that the overall prevalence of infected patients was19.1%. The most frequent infections were related to the urinary tract (48.2%), vascular catheter use (34.7%), and surgical site procedures (24.7%). The study concluded that the country of Benin has a high nosocomial infection rates and calls for urgent and hurried implementation of new national infection control policies. The study recommended Patient safety education and training of all individuals involved in healthcare service delivery. Additionally, the study also found it critical to highlight awareness of the burden of disease (Ahoyo et al., 2014).

2.2.3 Infection Control Precautions for HD unit:

An effective infection prevention and control program for HD units is comprising multiple interventions. These interventions must be designed to reduce the risk of infection based on the unique characteristics of the HD patient population and environment.

According to the APIC (2010), the role of the infection control program includes oversight of infection prevention efforts in addition to development of new and ongoing staff training program, facilitation of performance improvement projects, and periodic surveillance to assess risk and guide these projects; it is important to know that the infection control committee or personal that hold this responsibility with in the health facility have to maintain continuous communicate with all members of the HD health care staff including nurses, technicians, physicians, environmental services professionals, in addition to the patient and hid family; the success of an infection prevention and control program requires all members of the HD team to understand their role correctly. Each team member must be held accountable for compliance with infection prevention and control strategies during all health care service interventions (APIC, 2010).

Additionally, HD patients have unique vulnerability to healthcare associated infections (APIC, 2010). This vulnerability to HAIs is due to several factors including the number of human being in continuous contact, environmental conditions, and procedural factors

related to the HD settings, in addition to a multitude of HD patients comorbidities. Establishing an infection prevention and control program, which includes a bundle of strategies and interventions that are consistently performed, will reduce the risk of HAIs for both the employees and the HD patients. These interventions include hand hygiene, personal protective equipment, cleaning and disinfection of environmental surfaces, safe injection practices, immunization of patients and health care providers, vascular access care, and education and training programs (APIC, 2010).

2.2.3.1   Hand Hygiene:

Hand hygiene is a general term used to describe any type of hand cleansing, this term includes hand washing with soap and water, or applying an alcohol-based hand hygiene product (WHO, 2009).

Generally, Hand hygiene is considered as the single most important intervention in preventing infections in the healthcare services. There are number of factors that affect the Hand hygiene compliance of the health care staff. The large number of times that hand hygiene must be performed is one major impediment. Other challenges include frequent movement of dialysis staff between patients, frequent movement of dialysis staff between machines, and the incidents of urgency contact with patient and HD machine when alarm system suddenly. It is important to make hand hygiene as simple and expeditious as much as possible to encourage compliance and improve the outcomes (APIC, 2010).

To ensure hand hygiene effectively, there were many steps and criteria health care providers must follow. The first is to avoid wearing watches, rings and jewelry and take care of nails by keeping them short. The second is to wash hand at least 15 seconds, but no longer than 3 minutes. Finally, hands must be dried first with paper towels and use these to turn off the taps and dispose of paper towels in the appropriate waste bin (NHS Professional, 2013).

The WHO (2009) recommend health care staff to perform hand hygiene in the following five moments procedures: 1) before touching the patient; 2) Before implementing clean/aseptic procedures; 3) after exposure to patient's body fluids; 4) after touching a patient; and 5) after touching patient's surroundings. On the other hand, the Centers for Disease Control and Prevention indicated that hand hygiene practice should be always performed in the following six situations: 1) Before touching a patient, even if gloves will

be worn; 2) Prior to performing an aseptic task (e.g., placing an IV, preparing an injection); 3) After contacting with patient's blood, body fluids, excretions or wound dressings; 4) Before exiting the patient's care area after touching the patient or the patient's immediate environment; 5) If hands will be moving from a contaminated body site to a clean body site during patient care; and 6) after glove removal (CDC, 2011).

Chenoweth and colleagues (2015), conducted a study to assess the variation in infection prevention and control practices in the dialysis facilities. The study showed that the overall adherence to hand hygiene practice was 72%. Additionally, the study found that the compliance to hand hygiene before and after doing procedures was high; however, during procedures hand hygiene compliance average was 58%. Chenoweth and Colleagues (2015) confirmed that there are many areas still in a great need for improvement in hand hygiene practice and other infection prevention practices in HD facilities (Chenoweth et al., 2015).

An Indian study conducted by Shilpa and Colleagues (2015) to assess hand hygiene compliance of healthcare workers in a pediatric intensive care unit, it showed that the overall hand hygiene compliance was 80.9% (82.4% for physicians, 80.7% for nurses) (Shilpa et al., 2015).

According to the Iranian study conducted by Fesharaki and Colleagues (2014), 36% was the total hand washing compliance rate of the health care staff, 82.1% was the rate of washing hands compliance before leaving the ward, 72.3% was the rate of washing hands compliance after performing a procedure, 35.4% was the rate of washing hands compliance before performing a procedure, 17.2% was the rate of washing hands compliance when entering the ward. The study suggested that a long term and continuous training program to be planned and implemented in order to improve hand washing practice compliance of the health care staff.

Regarding the local descriptive cross-sectional study conducted in three pediatric hospitals in Gaza governorates to assess the compliance of health care staff with the Infection Prevention and Control Protocol. The study revealed the presence of low level of hand washing compliance (45.9%) among HCP (Eljedi & Dalo, 2014).

Lutfe and colleagues (2015) showed that the compliance to hand hygiene can be improved by continuous awareness building programs and frequent feedback. The study showed that there was a significant improvement in hand hygiene practice after the implementation of

such intervention program. The hand hygiene compliance was 42% among physicians and 56.3% among nurses before the intervention, and became 44.9% among physicians and 66.7% among nurses after the intervention (Lutfe et al., 2015).

According to Simddy and colleagues (2015), factors that affect the health care provider's compliance with hand hygiene guidelines are divided into two broad categories: Motivational factors (social influences, self-protection, use of cues, and acuity of patient care) and Perception of the work environment (resources, knowledge, information, and organizational culture). The study recommended further research to adopt a consistent and standardized approach and concluded that theoretical models should be used intentionally to better explain the complexities and constraints facing the hand hygiene practice (Simddy et al., 2015).

2.2.3.2   Personal Protective Equipment:

Personal protective equipment, commonly called as "PPE", refers to a variety of barriers and respirators used alone or in combination to protect mucous membranes, airways, skin, and clothing from contact with infectious agents; the selection of suitable PPE is based on the nature of the patient interaction and/or the likely modes of transmission of disease; Personal protective equipment includes gloves, Isolation gowns, masks, goggles, face shields, and respiratory protection (Siegel et al., 2007).

According to the APIC (2010), within the HD settings, all HCP's must wear Lab-style cover coats (non-fluid resistant lab coats), and a full isolation fluid resistant gowns in accordance to the situation. Gloves are recommended to be worn whenever caring for a dialysis patient, whether touching the patient's medical equipment, when handling lab specimens or used dialyzers, when cleaning HD machines, when cleaning stations, and when wiping up blood or other body fluid spills. Furthermore, gloves should be changed whenever moving from one patient or machine to another, when moving from a dirty to a clean site/task on the same patient (i.e., new gloves should be donned after touching the HD machine, prior to touching the same patient's vascular access), and when installing a cannulas or any other sterile devices.

The type of glove used should be based upon the type of procedure to be performed. Medical-grade non-sterile examination gloves and sterile surgical gloves are medical devices and general-purpose utility gloves are not promoted for medical use. Sterile

surgical gloves must meet standards for sterility assurance and are less likely than non-sterile examination gloves to harbor pathogens that may contaminate an operative wound (CDC, 2013).

However, because of allergy concerns, some facilities have eliminated or limited latex products, including gloves, and now use gloves made of nitrile or other material. Vinyl gloves are also frequently available and work well if there is limited patient contact. Gloves can become a means for spreading infectious materials to yourself, other patients or environmental surfaces. Therefore, the way you use gloves can influence the risk of disease transmission in your healthcare setting (CDC, 2004).

Face Mask should be worn if experiencing mild cold or cough illness in order to protect patients and other HCP's. Face mask should be worn during initiation and discontinuation of dialysis, and during reprocessing dialyzers or cleaning equipment in a sink (APIC, 2010).

According to the Canadian observational study which was conducted in 11 tertiary acute care hospitals participating in the Canadian Nosocomial Infection Surveillance Program, the overall adherence with appropriate PPE use in health care settings was modest. The majorities of HCWs put on gloves (88%), 83% of the study participants worn gowns, and 88% of the study participants worn face mask. Only 37% of the study participants were observed to use eye protective goggles. Mitchell and colleagues (2012) found that the overall adherence with appropriate PPE use in health care settings involving febrile respiratory illness patients was modest (Mitchell et al., 2012).

The local study conducted by Eljedi and Dalo (2014) showed that compliance of the study participants according to answers of the questionnaires was 90.9% compliance in wearing uniform and was 89.1% compliance in wearing gloves; the findings obtained from the HCP practices observation checklist revealed low level of compliance in wearing uniform (86.6%) and low level of compliance in wearing gloves (40.7%) (Eljedi & Dalo, 2014).

2.2.3.3 Cleaning and Disinfection of Environmental Surfaces:

Cleaning is defined by the CDC (2008) as the removal of visible soil (e.g., organic and inorganic material) from objects and surfaces. It is normally accomplished manually or mechanically by using water with detergents or enzymatic products. According to The

CDC, cleaning process is essential before attaining high level disinfection. This step is considered essential due to the fact that inorganic and organic materials that remain on the surfaces of instruments interfere with the effectiveness of this process.

CDC (2008) defined disinfection as the process that eliminates many or all pathogenic microorganisms except bacterial spores on inanimate objects. In health-care settings, objects usually are disinfected by liquid chemicals or wet pasteurization.

Factors that affect the efficacy of disinfection include: prior cleaning of the object; organic and inorganic load present; type and level of microbial contamination; concentration of and exposure time to the germicide; physical nature of the object (e.g., crevices, hinges, and lumens); presence of biofilms; temperature and pH of the disinfection process; and in some cases, relative humidity of the sterilization process (e.g., ethylene oxide) (CDC, 2008).

Cleaning and disinfection are two important components of infection prevention and control in the hemodialysis center. The American Environmental Protection Agency (EPA) and Food &Drug Administration (FDA) regulated disinfectants used to reprocess hemodialyzers, hemodialysis machines, and water treatment systems. Noncritical surfaces (e.g., dialysis bed or chair, countertops, external surfaces of dialysis machines, and equipment as scissors, hemostats, clamps, blood pressure cuffs, stethoscopes) should be properly disinfected with disinfectant unless the item is visibly contaminated with blood (CDC, 2008).

The outpatient HD setting presents a unique set of challenges related to environmental cleaning and disinfection because of the spatial cohort of patients and the temporal demands of multiple shifts (APIC, 2010). This setting is one in which patients are typically not separated from each other by physical barriers, such as walls or privacy curtains. Conditions common to HD settings can also interfere environmental cleaning, such as the typical 1:4 staff to patient ratio for dialysis technicians, the fast turnaround between patient treatments, and the procedurally intensive process of the dialysis treatment (APIC, 2010).

In the outpatient HD setting, each "patient station" contains a dialysis chair, the dialysis machine, and any other ancillary equipment or supplies necessary to provide the service; any equipment or item used for the patient must not be shared from patient to another without prior cleaning and disinfection (APIC, 2010).

The environment in HD units is particularly susceptible for being contaminated with blood borne pathogens such as HBV, HCV, HIV, and several other bacterial infectious agents. Microorganisms can survive on environmental surfaces for varying periods of time according to the type of this organism, its survival time ranging from few hours to several days or months. Therefore, it can be a continuous source for contamination transmission if no regular preventive disinfection measures were performed. (Kramer et al., 2006)

In the health care setting, contamination of environmental surfaces with various pathogens and the persistence of these pathogens on surfaces can be an important and frequent source of transmission of infectious agents due to frequent hand touching of HCWs, whereas cultures which was collected from different surfaces showed that 98.7% of these surfaces grown positive bacterial culture with some interesting resistance profile (Cataño et al., 2012).

A study conducted in southeast Iran to assess the compliance of healthcare providers with safety measures for control of Hepatitis viruses in hemodialysis centers. The study showed that the level of health care providers compliance with cleaning and disinfecting the shared instruments was 46.2%, the level of health care providers compliance with using single use materials for many patients was 52.4%, cleaning and disinfecting the surfaces of the dialysis machine and patient bed for every patient was 93.8%, disinfecting shared instruments like blood pressure cuff, stethoscope, and scissors for each patient was 46.2%, cleaning and disinfecting when observing blood in places was 93.3%, and cleaning and disinfecting dialysis machine based on protocol regulations was 93.8% (Moghaddam et al., 2012)

The local study that was conducted by Eljedi and Dalo (2014), it showed that the compliance with IPC recommended practices in using antiseptic and disinfectant was 79.8%, it also showed that 83.2% of HCP demonstrate that they use disinfectants in cleaning patient unit, while in 76.4% of times they conducted that patient unit is disinfected periodically (Eljedi & Dalo, 2014).

2.2.3.3.1 Cleaning and Disinfection of External Surfaces of HD Machines:

It is recommended to clean and disinfect the external surfaces of the HD machine after each dialysis session. In a typical HD setting, dialysis technicians and registered nurses generally perform the process of cleaning patient stations between dialysis sessions; dialysis pace and schedules must accommodate comprehensive cleaning between patient sessions (APIC, 2010).

Delarocque-Astagneau and colleagues (2002) conducted a study to identify the routes of transmission during an outbreak of infection with hepatitis C virus (HCV) in a hemodialysis unit; they suggested patient to patient transmission of HCV due to infection control mal practices and found that contamination of machine is the main cause of HCV outbreak (Delarocque-Astagneau et al., 2002).

2.2.3.3.2 Disinfection of the Internal Fluid Pathway of HD Machines:

The CDC and APIC guidelines do not suggest the disinfection of internal fluid pathways of "single pass" HD machines between patient sessions, except that when a blood leak event occurs. Routine disinfection and rinsing of the HD machine is recommended at the beginning or end of the day (or as recommended by the machine's manufacturer). The chemical disinfection protocol should be conducted according to the machine manufacturer's recommendation, including the concentration and dwell time (APIC, 2010).

2.2.3.3.3 Cleaning and Disinfection of Auxiliary Equipment:

The Auxiliary equipment that is used in HD may include reusable jugs for mixing bicarbonate solution, reusable priming buckets, and external pressure transducers. As per recommendation, any reusable item should be cleaned and disinfected prior to being used for another patient. The external pressure transducers should be changed between patients' uses. Nowadays, many HD machines are shifted to using the more hygienic automated process of mixing bicarbonate powder in cartridge on the individual machines leading to elimination of the use of reusable bicarbonate jugs. If bicarbonate solution in a jug is used, any "leftover" solution must be discarded and opened jugs should not be used after 24 hours because of the fact that sodium bicarbonate solution constitutes a good media for bacterial growth. Reusable priming buckets are now seldom used as most dialysis

companies include a disposable prime collection bag in each pack of sterile bloodline set and also with pre-attached external pressure transducers. With improved and better technology in some of the newer models of HD machines, prime collection bags or transducer protectors are not even required, whereas drainage of priming solutions can be done by connecting the bloodline to a drainage port in the HD machine and blood pressure sensors are completely non-invasive without using transducer connections and protectors (APIC, 2010).

2.2.3.3.4 Handling of Disposable Supplies and Reusable Items in HD Units:

Specific measures are recommended by both the CDC and the APIC safe for handling of disposable and reusable items in HD units that include the following: (a) items taken into an individual patient's HD station should be used only for that patient and be disposed immediately after use; (b) unused items should be cleaned and disinfected before returning it to a common clean area or used to another patient, or being disposed if it cannot be disinfected; (c) non-disposable items that cannot be comprehensively cleaned and disinfected (e.g., adhesive tape roll, cloth-covered blood pressure cuffs) should be dedicated for use on a single patient (APIC, 2010).

In the reality, allocating a blood pressure cuff for each patient may not be practical as too frequent detachment and reattachment of the cuff can cause imminent damage to the line connections nozzle. Reusable blood pressure cuffs that are covered with waterproof material with a smooth surface (instead of cloth covered cuffs) can be an attractive alternative as they can be comprehensively cleaned and disinfected between patient uses. There should also be a clear separation for storage and handling of clean supplies and medications far away from contaminated items (i.e., used supplies/equipment, blood samples, biohazard containers) (Karkar, 2014).

2.2.3.4   Safe Injection Practices:

An injection process can be defined as a procedure involving piercing of the human skin or mucus membrane either to introduce substances into the body or to withdraw a blood sample, body fluids, or body tissues for diagnostic purposes. The injection process may be

unsafe due to faulty technique leading to mechanical injury, or faulty disposal of used syringes and needles (Shanbhag, 2005).

The risks of unsafe injection practices have been well documented for the three primary blood borne pathogens human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV). The estimated global burden of disease from unsafe injection practices for these pathogens for the year 2000 included 37% of the new reported HBV infections; 39% of the new reported HCV infections; and 4.4% of the new reported HIV infections (Prüss-Üstün et al., 2005).

According to Chalya and colleagues (2015), a Tanzania study conducted at a tertiary care hospital in north-western provinces to assess the needle stick injuries and splash exposures among health care workers, around half of the study participants (48.6%) reported incidents of needle stick injuries and splash exposures within the previous 12 months, 65.1% of these reports were related to incidents of needle stick injuries alone, while 27.4% of these reports were related to incidents of splash exposures alone, and 7.5% of these reports were related to incidents of having had both needle stick injuries and splash exposures together. The study also found that the prevalence of needle stick injuries was higher among females (75.4%) and among those who were not trained on issues related to infection prevention and occupational risk reduction (93.3%). Additionally, the study found that the nurses had the highest prevalence of needle stick injuries accounting for 71.0% of the total incidents reported. Furthermore, The study found that at the time of the exposure, 54.7% of the healthcare workers were wearing protective equipment, double gloves were worn by 46.2% of the healthcare workers, no eye or facial protection (goggles) was worn during execution of procedures at the time splash exposures occurred, face masks were worn by only 5.7% of the healthcare workers. Moreover, the study found that during 91.3% of the incidents, healthcare workers took action immediately after needle stick injuries, while in 3.8% of the incidents healthcare workers did not take any action (Chalya et al., 2015).

Chalya and colleagues (2015) studied the reasons for not reporting the incident of needle stick injuries and splashes exposures among healthcare workers and found that: lack of healthcare workers knowledge of appropriate procedures after injury accounts for 37.7% of cases, source of injury thought not to be infectious accounts for 22.2% of cases, healthcare workers worried about future work consequences accounts for 15.2% of cases, and

healthcare workers did not know how to report the incident accounts for 6.9% of cases. The study concluded that needle stick injuries and splash exposures are common among healthcare workers and are under reported and post exposure management is generally poor. The study recommended that all healthcare workers should be trained on issues related to infection prevention and occupational risk reduction the study also recommended the hospital to establish surveillance system for registering, reporting and management of occupational injuries and exposures (Chalya et al., 2015).

According to a Saudi study which conducted to assess safe injection practices among HCW's in health care facilities, they found a lack of injection control polices in all facilities and a lack of supplies needed for safe injection practice. Moreover, Ismail and colleagues (2007) found that compliance with proper needle manipulation before disposal was 41%, compliance with safe needle disposal was 47.5%, and compliance with safe syringe disposal was 0%. Additionally, the study found that 66.2% of HCW's experienced needle stick injury (Ismail et al., 2007).

According to Rice and colleagues (2015), a study conducted to assess the occupational sharps injuries among health care workers in England, Wales and Northern Ireland, out of the total exposures reported as percutaneous injuries among health care workers, of which 94% of the reports involved a sharp item. Out of these reported injuries, 49% of these reports involved an HCV infected source patients, 7% of these reports involved an HBV infected source patients, 23% of these reports involved an HIV infected source patients, and 6% of these reports involved a source patient co-infected with two or all three of these viruses. The study found that non-compliance with standard infection control precautions for the handling and safe disposal of clinical waste was reported as the main contributory factor for 16.2% of the significant sharps injuries over the study period. Moreover, the study mentioned that all these sharps injuries resulting from noncompliance were fully preventable (Rice et al., 2015).

2.2.3.5 Immunization of Patients and Health-Care Personnel:

HCWs are at risk for exposure to serious and sometimes deadly diseases. If they work directly with patients or handle material that could spread infection, they should get appropriate vaccines to reduce the chance that they will get or spread vaccine-preventable diseases. Moreover, certain vaccines are recommended specifically for patients with

chronic kidney disease because of the fact that they are all considered as an immune compromise patients (CDC, 2017).

The recommended immunization for patients with chronic kidney disease, especially dialysis dependent patients, includes a minimum of three vaccinations types: (a) hepatitis B vaccine; (b) pneumococcal vaccine; and (c) influenza inactivated vaccine (IIV). Other vaccines recommended for healthy individuals can be used if indicated except any live attenuated vaccines that are generally contraindicated in patients who are immune compromised. Recommended immunizations for dialysis personnel include: Hepatitis B vaccine, Influenza vaccine, Measles, mumps and rubella vaccine, Varicella vaccine and tetanus, diphtheria with a cellular pertussis (Tdap) vaccine. Hepatitis B vaccination is specifically recommended for susceptible healthcare workers at risk for exposure to blood and body fluids. (CDC, 2017).

According to Alkhan study (2015), a Saudi study conducted to estimate the prevalence of HBV and HCV infections among hemodialysis patients, the study revealed that the prevalence of HBV and HCV infections among hemodialysis patients varies greatly from country to country, the study found that 14% of hemodialysis patients in Saudi Arabia are hepatitis B positive and 7% of hemodialysis patients are hepatitis C positive. In other Arab countries hepatitis C positive cases were 23.7% in Sudan, 71% in Kuwait and 41% in Tunisia, and in Egypt the prevalence of hepatitis C in hemodialysis patient ranges from 52.3% to 82%. The study concluded that the long duration of hemodialysis was significantly associated with HBV and HCV positivity, suggesting that HBV and HCV were nosocomial transmission and the non-adherence to the known universal infection control precautions could be contributing factor to the high prevalence (Alkhan et al., 2015).

According to Elzouki and colleagues (2014) whom studied the Hepatitis B and C status among healthcare providers in the five main hospitals in eastern Libya, the overall frequency of HBsAg positivity was 1.8% among healthcare providers, only half of the studied healthcare providers (51.4%) had immunity to HBV infection as manifested by the detection of Anti-HBs antibodies. Moreover, the overall positivity of Anti-HCV antibodies was 2.0% among healthcare providers, only half of the healthcare providers (52%) received full vaccination doses (three doses) against HBV infection. Among them, the

efficiency of the vaccine as manifested by anti-HBs positivity was approximately 98.0% (Elzouki et al., 2014).

According to the local study conducted by El-Ottol and colleagues (2010) to assess the prevalence of hepatitis B virus and hepatitis C virus among hemodialysis patients in Gaza governorates. The study found that the overall prevalence of HBV among the four HD centers was 8.1%. Moreover, the study found that the overall prevalence of HCV among the four HD centers was 22%. The study concluded that the much higher prevalence of Hepatitis viruses among HD patients compared to the normal population of Gaza governorates indicates a causative relation between HD and hepatitis viruses transmission. The study also concluded that extremely careful observation of preventive infection control measures is essential to limit Hepatitis viruses' transmission in HD centers (El-Ottol et al., 2010).

The local study conducted by Eljedi and Dalo (2014) showed that the 90.8% patients with infectious disease have been isolated from other patients.

2.2.3.5.1 Serologic Testing:

Serologic testing for immunity is not necessary after routine vaccination of adults. However, post vaccination testing is recommended for persons whose subsequent clinical management depends on knowledge of their immune status, including certain health care and public safety workers, chronic hemodialysis patients, HIV infected persons, and other immune compromised persons. Testing should be performed 1-2 months after administration of the last dose of the vaccine series by using a method that allows determination of a protective level of anti-HBs (e.g., >10 mIU/mL) (CDC, 2012).

Persons found to have anti-HBs levels of <10 mIU/mL after the primary vaccine series should be revaccinated with a second hepatitis B vaccination series. Administration of three or four doses on an appropriate schedule followed by anti-HBs testing 1-2 months after the third dose is usually more practical than serologic testing after one or more doses of vaccine. Persons who do not have a protective concentration of anti-HBs after revaccination should be tested for HBsAg. If the HBsAg test result is positive, the person should receive appropriate management. Persons whose test was negative for HBsAg should be considered susceptible to HBV infection and should be counseled about precautions to prevent HBV infection and the need to obtain hepatitis B immune globulin

post exposure prophylaxis for any known or likely parenteral exposure to HBsAg positive blood (CDC, 2012).

According to a Saudi study conducted to determine the response to hepatitis B virus vaccination in patients on hemodialysis in in the Prince Salman Center for Kidney Diseases at Riyadh capital. Al Saran and colleagues (2014) found that 89.6% of patients have the level of hepatitis B surface antibodies (HBsAb) more than 10 IU/L, while only 10.4% of patients have the level of HBsAb less than 10 IU/L (Al Saran et al., 2014).

2.2.3.6 Vascular Access: Care and Prevention of Infection:

According to Marques (2012), catheter related infections is an important source of morbidity and mortality in hemodialysis patients, being responsible for the deaths of approximately 2000 to 5000 hemodialysis patients each year in the United States. A recent clinical trial addressing the prevention of Catheter related infections demonstrated that 12% of bacteremia episodes resulted in death. The cost of infection consequences to the health care system is also substantial. Data from the United States Renal Data System and Medicare estimated the total costs of Catheter related infections may approach 1 billion dollars per year (Marques, 2012).

The primary risk factor for infection in HD patients is the vascular access with central venous catheters which consists of three types: 1) Catheter, tunneled and non-tunneled; 2) Fistula, also called AVF; and 3) Grafts -, also called AVG. Infection rates with tunneled dialysis catheters has been estimated to be 10 times higher than that of arteriovenous fistula (AVF) or AV graft . These infections can lead to sepsis and result in bacterial seeding or infection of implants such as total hip/knee and cardiac valves. This is a serious complication that can result in significant additional morbidity. As it is known, aseptic technique is one of the practices designed to reduce the risk catheter related bloodstream infection; it should be used to prevent contamination of the catheter system including the use of a surgical mask for staff and patient and clean gloves for all catheter system connect, disconnect, and dressing (APIC, 2010).

Murea and colleagues (2014) conducted a study aimed to evaluate the risk of catheter related bloodstream infection in elderly patients on HD. The study found that the incidence of a catheter related bloodstream infection per 1000 catheter days of 1.97 in nonelderly and 0.55 in elderly patients. The study concluded that the elderly patients on hemodialysis

using tunneled central vein dialysis catheters are at lower risk of catheter related bloodstream infection than their younger counterparts (Murea et al., 2014).

Another study conducted by Ziegler and colleagues (2015) to identify the attributable mortality of central line associated blood stream infections. The study found that an odds ratio of in hospital death associated with CLABSI as 2.75 (CI 1.86–4.07) and 1.51 (CI 1.08–2.09). The study concluded that central line associated blood stream infections is associated with a significantly increased risk of death supporting the use of extensive efforts to reduce these infections (Ziegler et al., 2015).

A local study was conducted by Eljedi and Dalo (2014). It showed that 80% of the study population use sterile equipment in sterile way for invasive procedures.

Several studies were conducted to find strategies to reduce central line associated blood stream infections by medical or/and administrative intervention. Moore and colleagues (2014) showed that the use of a prophylactic gentamicin/citrate lock was associated with a substantial reduction in catheter related bloodstream infection; the study is considered as the first to report a survival advantage of antibiotic lock in a population at high risk of infection related morbidity and mortality. While Zingg and colleagues (2014) suggested that clinically relevant reduction of hospital wide central line associated blood stream infections was reached with a comprehensive, multidisciplinary and multimodal quality improvement program including aspects of behavioral change and key principles of good implementation practice. This is one of the first multimodal, multidisciplinary, hospital wide training strategies successfully reducing central line associated blood stream infections (Moore et al., 2014; Zingg et al., 2014).

2.2.4 Assessment of the Compliance to Infection Prevention and Control:

Prevention of hospital acquired infections is the responsibility of all individuals and health care service providers. Everyone must work cooperatively to reduce the risk of infection for patients and staff. This includes personnel providing direct patient care, management, and physical plant, provision of materials and products, and training of health workers (WHO, 2002).

WHO recognizes that older facilities and facilities in developing countries may not be able to achieve these standards. However, the underlying principles should be kept in mind when local planning and changes or revisions are made (WHO, 2002).

Assessment of compliance to infection prevention and control is very important to assist health departments in assessing infection prevention practices and guide quality improvement activities. It may also be used by healthcare facilities to conduct internal quality improvement audits (CDC, 2017).

Many studies conducted to assess the compliance of HCP to IPC in The Gaza governorates. Awad (2009) studied the health care workers compliance to IPC protocol in the Neonatal Intensive Care Units in the Governmental Hospitals in Gaza Governorates. The study clarified that the adherence to infection prevention and control was 56%; while the attitudes is high (Awad, 2009).

Another local study of health care workers compliance to IPC protocol in at the Governmental Pediatric Hospitals at Gaza Governorates showed high level of attitude but lower level of compliance toward IPC. The study found that wearing uniform practices of the health care providers was 86.6%, the health care providers hand washing practice was 45.9%, the health care providers wearing gloves practice was 40.7%, the health care providers using antiseptic and disinfectant practice was 49.16%, and the health care providers safe work practices was 45.3%. It also showed that only 28% of the respondents used to rules that organize the visitors' entrance to unit (Eljedi & Dalo, 2014).

2.2.5 Barriers of Compliance to IPC Protocol:

Many research studies have explored barriers that prevent or decrease the health care worker to comply with IPC protocols. Most of these studies have shared some causes, and added other different variables according to demographic and personal differences.

According to the WHO (2007), a description of perceived barriers to adherence with hand hygiene practices shows the following causes: 1) skin irritation caused by hand hygiene agents; 2) inaccessible hand hygiene supplies; 3) interference between practices and health care worker patient relationship; 4) patient needs as a priority over hand hygiene; 5) wearing of gloves forgetfulness; 6) lack of knowledge of guidelines; 7) insufficient time for hand hygiene related to high work load and understaffing; and 8) the lack of scientific

information about impact of improved hygiene in lowering the incidence of hospital acquired infections.

Travers and colleagues (2015) conducted a study to explore barriers to implementing and maintaining IPC practices as well as to describe strategies used to overcome these barriers. They found that five key themes emerged as perceived barriers to effective IPC: 1) language/culture; 2) knowledge/training; 3) per-diem/part-time staff; 4) workload; and 5) accountability.They suggested strategies that may be used to overcome these barriers included: translating in services, hands on training, on the spot training for staff, increased staffing ratios, and inclusion/empowerment. Understanding IPC barriers and strategies to overcome these barriers may better enable HCPs to achieve infection reduction goals (Travers et al., 2015).

According to Eljedi and Dalo (2014) local study, the most important reasons for non-compliance with the IPC protocol were: absence of education or training program (61.5%), lack of knowledge (52.4%), and scarcity of the required supplies (46.9%) (Eljedi & Dalo, 2014).

2.2.6 Education and Training Programs:

Staff education and oversight of compliance with infection prevention practice is mandatory in all direct care areas including HD settings. Educational sessions, training programs, and management support and supervision have been found to be critical factors that can improve HCP's compliance with IPC practices significantly (APIC, 2010).

A local study was conducted to assess the compliance of health care providers with the infection prevention and control protocols in the governmental pediatric hospitals in Gaza showed that only 16.9% of respondents had participated in training session about IPC. The study recommended that the IPC protocol should be available in all the departments; intensifying education and training. (Eljedi & Dalo, 2014).

Abkar (2013) was conducted a study to assess the IC practices in the ministry of health and population hemodialysis center in Hodeidah Governorate, Yemen. The study showed that a large percentage of HCWs (89.5%) in the hemodialysis center did not attend training courses on issues relevant to IC compared to only 10.5% of HCWs who attended training courses on these issues (Abkar, 2013).

According to the Egyptian study conducted at Assiut governorate which aimed to assess educational training program for nurses working in maternal and child health centers regarding infection control, the results of the study showed that the percentage of nurses that has sufficient knowledge regarding the concept of epidemiology increased from 40.2% to 88.9% after exposure to the program. Moreover, the nurse's knowledge about universal precautions improved from 12.5% to 80.6%, the nurse's adherence to hand washing has increased from 87.5% to 100%, the technique of hand washing has been improved from 33.4% to 76.4%, and wearing gloves practices increased from 93% to 98.6%. These results have encouraged the researcher to recommend periodic refreshing training course to keep the improvement (Hassan et al., 2004).

Another relevant study was conducted to compare the rates of central line associated bloodstream infection for all hemodialysis patients with a central catheter across the majority of Shariati hospital wards. The study found that a noticeable decreased in central line associated bloodstream infection from 18.1% at baseline to 6.5% after implementation of the intervention. The study concluded that providing intensive training can positively influence the control of central line associated bloodstream infection in large teaching hospitals (Amini, 2016).

2.2.7 Knowledge and Practices of IPC:

The levels of awareness to universal precaution among health care workers have various degrees in different countries; many research studies have discussed this issue and most of them reveal differences between knowledge and practice of HCPs in different health institutions.

Local studies were conducted by Eljedi and Dalo (2014), Awad (2009), they showed that the knowledge about IPC was low, but the attitude was high. They recommended comprehensive regular training program as part of in-service education for all HCP's.

Geroma (2015) conducted a study in Ethiopia aimed to assess the knowledge and practices towards infection prevention and associated factors among healthcare providers of public health facilities. The study found that 46.3% of the HCP's had poor knowledge towards infection prevention. The study concluded that infection prevention training and presence of infection guideline in the health facility are determinant factor to knowledge and

practice. The study recommended further studied to address this topic clearly (Geroma, 2015)

According to Sarani and colleagues (2014), a study conducted to analyze the knowledge and practice of HCP's about standard precautions for hospital infection. The results of the study showed that 43% of the participants had poor knowledge. The study concluded a low level of awareness among the personnel about hospital infection. The study suggested to provide training sessions on the prevention and control of HAI to increase the awareness of HCP's and hold practical courses for practicing these principles (Sarani et al., 2014)

2.2.8 Safe Sharp Disposable Practices:

Sharps is a medical term for devices with sharp points or edges that can puncture or cut skin, theses sharps may be used to manage the medical conditions of people (FDA, 2016). Waste generated by health care activities includes a broad range of materials from used needles and syringes to soiled dressings, body parts, diagnostic samples, blood, chemicals, pharmaceuticals, medical devices, and radioactive materials. Poor management of health care waste potentially exposes health care workers, waste handlers, patients, and the community at large to infection, toxic effects and injuries, and risks polluting the environment. It is essential that all medical waste materials are segregated at the point of generation, appropriately treated, and disposed of safely (WHO, 2017). The segregation also needs to be performed between the liquid and solid waste products. Categorizing the medical waste with correct segregation to isolate and manage each waste in the proper way. For this purpose, the segregations done in colored waste containers, label coding, and plastic bags (Biomedical waste solutions, 2015).

Used sharps should be immediately placed in a sharps disposal container. These containers are made of puncture resistant plastic with leak resistant sides and bottom. They also have a tight fitting, puncture resistant lid. A heavy duty plastic household container, such as a laundry detergent container can be used as an alternative. Used needles and other sharps are dangerous to people if not disposed safely because they can injure people and spread infections that cause serious health conditions such as HBV, HCV, and HIV (FDA, 2016).

An Indian study was conducted to assess the awareness of occupational safety measures as universal precautions, biomedical waste handling, disposal and its compliance in their

daily practice. The study found a faulty practice regarding to recapping of needle which was prevalent among 67% nurses and 83% of technicians (Phukan, 2014).

The local study conducted by Eljedi and Dalo (2014) showed very weak compliance with the recommendation of the IPC protocol in dealing with sharps and waste disposals. The study showed that 3/4 of the study population remove needles from used syringes before disposal, 76.4% of the study population comply with not to bend or break used needles prior disposal, and only 41% of the study population don't recap used needle before disposal. The study showed also 69.9% of the study population dispose all sharps in puncture resistance containers. The study concluded that there is a big problem in labeling and separating wastes as there is no policy in hospitals to separate or label medical waste products (Eljedi & Dalo, 2014).

Another local recent study conducted by Qeshta (2016) showed that 86% of the study participants were performing separation of the dental wastes before disposal, 84% of study participants were disposing blood contaminated wastes in general garbage. The study concluded that practices toward waste disposal requires further improvement (Qeshta, 2016).

Another study conducted by Tabash (2016) to assess the pharmaceutical waste management and development of an integrated management system at Governmental Hospitals in GG. The study revealed that there was insufficient segregation, collection, transportation, storage, treatment and disposal of medical waste. Only 17.7% of the study participants indicated that medical waste was segregated prior to disposal. The study revealed that there was inadequate use of color code container/ bags, and lack of waste label. In addition, the study revealed that there was no identification symbol for medical waste available. However, nearly all generated waste was collected in the same black bags and segregation was applied only for sharp waste, which was collected in special sharp boxes. Moreover, the study showed that PPE were available in the study settings, but with insufficient quantity and there was insufficient number of transportation container/ trolley and that the same trolley was used for many departments in the same time (Tabash, 2016).

Chapter 3: Methodology

This chapter illustrates the research methodology of the study. The chapter presents the study design, study settings, period of the study, target population, data collection tools and eligibility criteria. It also presents the data collection process, response rate, data entry and statistical analysis, ethical and administrative considerations, and validity of the study, finally the limitations of the study.

3.1 Study Design

The design of the study is descriptive, analytical, and cross sectional. Cross-sectional design is practical, relatively simple, cheap, easy, and enables the researcher to meet the study objectives in a short time (Martins et al., 2005). It is a triangulation one that includes both quantitative and qualitative data collection approaches. This design is chosen since it is considered one of the best design to describe the status of compliance of health care provider's with the Palestinian IPC protocol, in addition, it provides snapshot of the outcome and the characteristics associated with it. The triangulation also enriches the study and strengthens the scientific rigor of findings.

3.2 Study Settings

This study was conducted at the five general governmental hospitals in the GG: Al Shifa Medical complex (Al Shifa), Nasser Medical complex (Nasser), Al Aqsa Martyrs hospital (Al Aqsa), Mohammed Al Najjar Hospital (Al Najjar) and Abdelaziz Al Rantisi Hospital (Al Rantisi). For detailed information about the study settings, see annexes (3&4).

3.3 Target Population

The researcher have used census population as the questionnaire and checklists were distributed and observed for all official physicians and nurses working at governmental HD units and meets the eligibility criteria. The study participants were: 78 health care providers (58 nurses and 20 physicians who are formally working at the HD units in the five governmental at the time of study implementation.

The study population of the qualitative method consists of six (6) health care providers from the administrative jobs related to the work in the HD units. The group included a

chief physician from the General directorate of hospitals; a chief nurse from the General directorate of hospitals; the supervisor nurse of HD unit at Al Shifa medical complex; Al Shifa medical complex infection control committee nurse; The MoH central infection control committee chief physician and chief nurse.

3.4 Period of the Study

The study has been started from February 2016 to October 2016, the study has been started in February 2016, by preparing the research proposal and designing the questionnaire. Approvals from Al-Quds University, Helsinki Committee and from MOH management were received, and then Pilot study and data collection are completed from May 2016 to October 2016. Data entry, analysis and writing the final report continued till the mid of March 2017.

3.5 Response Rate

The total number of distributed questionnaires was 78. Additionally, the number of returned questionnaires was 77. Therefore, the response rate was 98.7%.

The sample of the focus group has completely answered all the interview questions.

3.6 Eligibility Criteria

3.6.1 Inclusion Criteria:

All the physicians and nurses who are officially working in governmental HD units as governmental employees at the time of study implementation and have experience period more than six months.

3.6.2 Exclusion Criteria:

Any physicians or nurses who are working in the HD units with the following:

- Hired in the last six months.
- In long vacation or maternity leave.
- Working under temporary contract.
- Working as a volunteer.

3.7 Ethical Considerations

During all stages, the researcher was committed to all ethical consideration required to conduct the study. Ethical approval (Helsinki committee approval) was obtained from the Palestinian health Research Council in Gaza (Annex 8). In addition, an official approval was obtained from the MoH relevant authorities: General Directorate of Human Resource, General Directorates of Hospitals, and Hospitals management (Annex 9). Every participant in the study received a complete explanation about the research purposes and confidentiality and about the optional participation in the study. All the ethical considerations were observed. Respect for people and human rights, respect for truth, and confidentiality were maintained.

3.8 Study Instrument

Four tools was used in this study:

For quantitative date collection the researcher used three tools which are self-administered questionnaire, observation checklist for the health care provider practice, and observation checklist of the physical environment assessment. The fourth tool was focus group which was used for qualitative data collection.

Questionnaire design: the researcher used a structured questionnaire (Annex 5) which is clear, with no complex terms, no jargons, no leading questions, nor double parallel questions. The questionnaire constituted five sections; it takes approximately fifteen minutes for participants to complete. The first part covered the information related to personal and professional information. The second part contained questions that assess the health care provider's knowledge about the IPC protocol, and includes variables that can be used in the assessment of the hospital action to improve IPC practices. The third part explores barriers that decrease HCP's compliance with IPC protocol. The fourth part assesses the HCP's perception and attitude toward IPC and its recommended practices. The last part explores the congruent of the HCP's practices with the IPC protocol recommendations.

The observation checklist for the health care provider was constructed and observed by the researcher (Annex 6(I)), it assesses the main five practices domains recommended in the

IPC protocol which are: wearing uniform, hand washing, using gloves, using antiseptics and disposables, and proper sharp disposal practices.

The observation checklist for the physical environment was constructed to assess the physical environmental fitness for the IPC protocol requirements (Annex 6(II)). It assesses the availability of equipment and supplies in each HD units at the study settings.

All the data collection tools was developed by the researcher in the light of IPC protocol. Moreover, these tools was reviewed by experts relevant to the study context (Annex 7).

The focus group was designed to interpret unclear findings and many deep questions. Discussions were conducted during the meeting and included ten topics discussing the following: Importance of using IPC protocols in the HD units at the governmental hospitals; Presence of the Palestinian IPC protocols; Content of the Jordanian IPC protocols; Presence of National IPC protocol; Training program on the content of the Jordanian IPC protocol and monitoring system for implementation; Vaccination programs and policies to protect HCPs working at the HD units; The procedures that the HCPs follows after exposure to injury from sharp contaminated materials; Monitoring system for the IPC practice inside the hospitals; Barriers for good compliance with IPC Protocol; and Recommendations for improving the compliance with IPC Protocol in the HD units.

3.9 Scientific Rigor

Reliability, face validity, content validity, and pilot study were discussed in this section.

3.9.1 Reliability for Quantitative Part:

Reliability is a condition for validity; it is about the consistency of the measurement. The following steps were performed to assure instrument's reliability:

- Standardization of methods and instrument
- Daily checking and validation
- Conducting the data entry in the same day of data collection
- Re-entry of 5% of data after finishing the data entry assured correct entry procedure and decrease entry errors.

- The researcher implemented on the job training for five volunteer data collectors to make sure the data collection is done properly and being reliable.

3.9.2 Face Validity:

Face validity is the degree to which the general appearance of certain test is sensationally consistent with and providing relevant answers to its purpose of measurement. The questionnaire was structured in an organized way to allow easy and smooth data collection and entry. During the validation process, the questionnaire lay out was reviewed and formatted several times until a final version looked elegant.

3.9.3 Content Validity:

To ensure that the content of the questionnaire is valid and provide an adequate representativeness of what researcher need to measure, because of that content validity usually depends on the judgment of experts in the fields. Eight experts with different backgrounds participated valuably in the questionnaire and checklists evaluation and validation process (Annex 7). The content validation aimed to assess the relevance of each domain, the importance of each particular item, and to check if the contents of the questionnaire seem appropriate to its intended purpose and overall aim, moreover, to ensure the statistical consistency and capability to analyze data properly. Additionally, the researcher considered all experts' feedback and comments. Thus, the final version of the questionnaire and checklists incorporated all the experts' feedback. Modifications were done including rephrasing questions, changing the order of some questions, adding new questions, and removing irrelevant questions.

3.9.4 Pilot Study:

A pilot study was conducted before the actual data collection started, with an aim of exploring the appropriateness and reliability of the questionnaire, piloting also aimed to have an idea of what obstacles might face the researcher during the data collection phase such as the accessibility to participants or records and to minimize the non-response rate. The pilot study was conducted on 10% of the main study sample. The pilot study sample consisted of 3 physicians and 5 nurses distributed at Al Shifa and Al Rantisi hospital. The pilot sample was included in the study population.

3.9.5 Qualitative Part:

To maintain the trustworthiness of the qualitative part; peer check was done through experts to enrich the key informative interview questions when required. Then, check representativeness was done to ensure no significant group was overlooked. In addition, get their feedback on the major findings to assure accuracy and transparency of the transcripts. Again, recording the interviews enhanced tracking up facts and re-checking the accuracy of the transcripts and recordings will be kept for tracking at any time.

3.10 Data Collection

The data was collected through the questionnaire and the observation checklists during March, April, and May 2016 by the trained volunteer data collectors. These instruments was designed to match the research objectives and to give accurate and relevant information to the research questions.

The volunteer data collectors distributes the 78 questionnaires to HCPs and stays in the hospital to receive it from them in the same shift, and repeats that action three to four days in different shifts each week for ten successive weeks, during they stay in the departments, they fills in 228 observational checklists for HCP's practice and 5 observational checklists for physical environment.

The researcher conducted the focus group with six key persons related to the work in the HD units, the focus group was conducted at the General Directorate of Hospitals in October 2016 after the time of analysis of the questionnaire. The findings of the focus group were written by the researcher besides a recorder cassette tapping all the focus group discussions.

3.11 Data Analysis

The researcher used the Statistical Package of Social Science (SPSS version 20, Chicago, USA) program to run descriptive and inferential statistics. The researcher has developed database for data entry, the variables were coded then entered into the computer. Data cleaning was conducted to check the presence of any missing or error in data entry (through running frequency analysis). All suspected or missed values were checked by revising the available data collection forms. The collected data (questionnaires and

observational checklists) were organized and analyzed based on the objectives of the study. To detect the differences and assess the significant relationships among variables, the following analysis methods were performed:

1. Frequency distribution,
2. Cross tabulation,
3. General scores,
4. t - Test,
5. Chi-square test,
6. ANOVA and Post-Hoc test,
7. Knowledge, attitude & practice scores

The researcher determines the P value to be ($\leq 0.05\%$) with 95% confidence level.

For qualitative data the data were collected in text narratives and audio records, the data were summarized after reading and listening to each question and transcribe each participant's response, including only the relevant and useful portions of the discussion, the final step was extracting the themes from the summarized data and rewrite the final result in the form of text narrative.

3.12 Limitations of the Study

The researcher reported the following constraints:

1. Hawthorne effect of the study participants during filling of the observational checklist.
2. The instability of work schedules of some HCPs at night shifts.
3. All the questions in the questionnaire are closed-ended which may hinder some important points on knowledge and practice of the participating physicians.

3.13 Obstacles Faced the Researcher

1. Limited availability of up-to-date journals and books about the title relevant to the country context and situation.
2. Time factor.
3. Lack of funding. The study is self-funded.
4. The problem of electricity blackouts which limited the access hours to the internet.

Chapter 4: Findings

This chapter presents the main findings of the statistical analysis of the data and the interpretation of the main results. It begins by outlining the main descriptive and statistical findings of the semi-structured questionnaires followed by the findings from the two observation checklists. The first checklist was used to extract data from the practice of the study participants working at the HD units; the second checklist was used to extract data from the physical environment of the HD units in the study settings.

4.1 Self-Administered Questionnaire

In total, 78 self-administered questionnaires were distributed among the study settings. 77 of the participants accepted to fill the questionnaire. 34 questionnaires were collected from Al Shifa medical complex, which represents 44.1% of the total sample; 15 questionnaires were collected from Nasser medical complex, which represents 19.5% of the total sample; 10 questionnaires were collected from Al Aqsa hospital, which represents 13% of the total sample;9 questionnaires were collected from Al Rantisi hospital, which represents 11.7% of the total sample; and 9 questionnaires were collected from Al Najjar hospital, which represents 11.7% of the total sample.

4.1.1 Characteristic Variables of the Study Participants:

Table 4.1: Distribution of the study participants by characteristics variables

Variable	No.	%
Gender		
Male	66	85.7
Female	11	14.3
Age		
23 - 35 years	39	50.6
36 - 48 years	24	31.2
49 – 60 years	14	18.2
Marital Status		
Single	4	5.2
Married	72	93.5
Divorced	1	1.3
Occupation		
Physician	19	24.7
Nurse	58	75.3
Qualification		
Diploma	22	28.6
BSc	45	58.4
MSc	6	7.8
PhD	4	5.2
Managerial Position		
Without	60	77.9
Head of Branch	2	2.6
Supervisor	4	5.2
Head of Section	11	14.3
Years of Work Experience in HD Unit		
<5 year	26	33.8
5-15 year	41	53.2
>15 year	10	13
Total Years of Work Experience		
<5 year	16	20.8
5-15 year	34	44.2
>15 year	27	35.1

Regarding the age of the study participants, as shown in the Table (4.1), the overall mean age of the study participants was 38.56 years with (SD= 8.905, Range=37), the most common age group was 23-35 years old (50.6%). About 31.2% of the study participants

were between 36-48 years old, while 18.2% of the study participants were older than 48 years old.

Regarding the marital status of the study participants, as shown in the Table (4.1), the majority of study participants (93.5%) were married and only 5.2% of the study participants were single, while divorced represented 1.3% of the study participants.
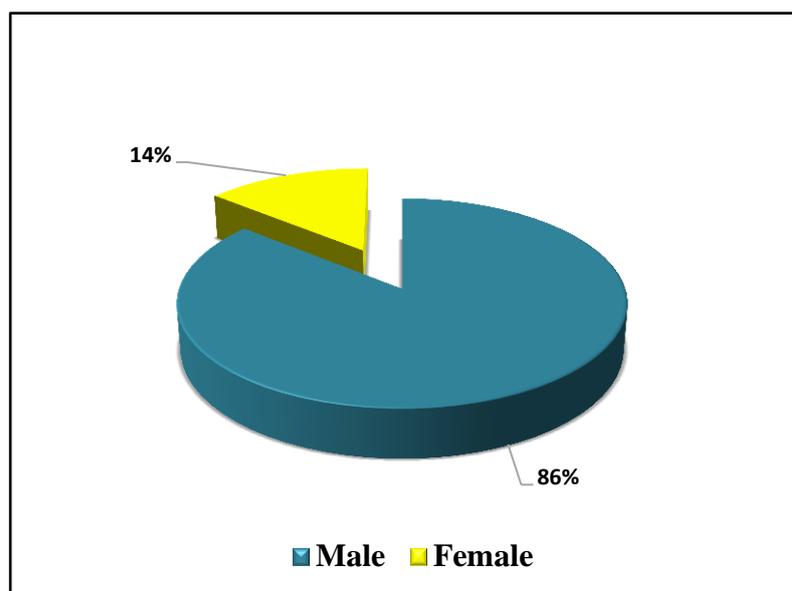
Figure 4.1: Distribution of the study participants by gender

Regard to the gender of the study participants, as shown in Fig. (4.1), out of the 77 participants, 18 were male physicians, while 48 participants were male nurses with total males of 85.7%. Moreover, 11 participants (14.3%) were female of both physicians and nurses.

Regarding the academic qualifications of the study participants, as shown in Table (4.1), the participants who had Diploma degree represented 28.6% of the study participants, about 58.4% of the study participants had a Bachelor degree (BSc), 7.8% of the study participants had master's degree, and only 5.2% of the study participants had Doctor of Philosophy degree (Ph.D.).

Concerning the hospital managerial position of the study participants, Table (4.1) showed that 77.9% of the study participants had no managerial positions, 2.6% of the study participants had a head of branch managerial position, 14.3% of the study participants had a head of section managerial position, and 5.2% of study participants had supervisor managerial position.

Regarding the years of work experience in the HD units at the hospitals, the average years of work experience of the study participants in the HD units was 8.38 years (with a minimum of 1 years and maximum of 25 years, SD=5.626). The average years of total work experience of the study participants was 12.3 years (with a minimum of 3 years and maximum of 31 years, SD=7.707) as shown in the Table (4.1).

4.1.2 Distribution of Study Population according to Actual Salary:

Table 4.2: Distribution of study population according to actual salary

Variable		<2000NIS	2000-4000NIS	>4000NIS
Physician	No.	8	4	7
	%	42.1	21.1	36.8
Nurse	No.	37	20	1
	%	63.8	34.5	1.7
Total	No.	45	24	8
	%	58.4	31.2	10.4

Regarding salary paid level to the study participants, as shown in Table (4.2), 42.1 % of physicians and 63.8% of Nurses had monthly salary less than 2000 NIS. The salary payment mean was 3163 NIS for physicians and 2028 NIS for nurses, the findings of the study showed that there was a statistically significant difference among health care providers occupation regarding their monthly salary with (t =2.588, P=0.017).

From the researcher perspective, the percentage of physicians and nurses who had a low salary is high, as shown in Table (4.2). The main reason for such high percentage could be due to the halt in salary payments due the Palestinian political conflict which led employees to look for alternative sources of incomes. The health care staff work in the private sector may have negative impact on the quality of the provided health care services; the work of the physician and nurses in more than one job may lead to high level of stress and fatigue.

4.1.3 Distribution of Study Population According to Work Place:
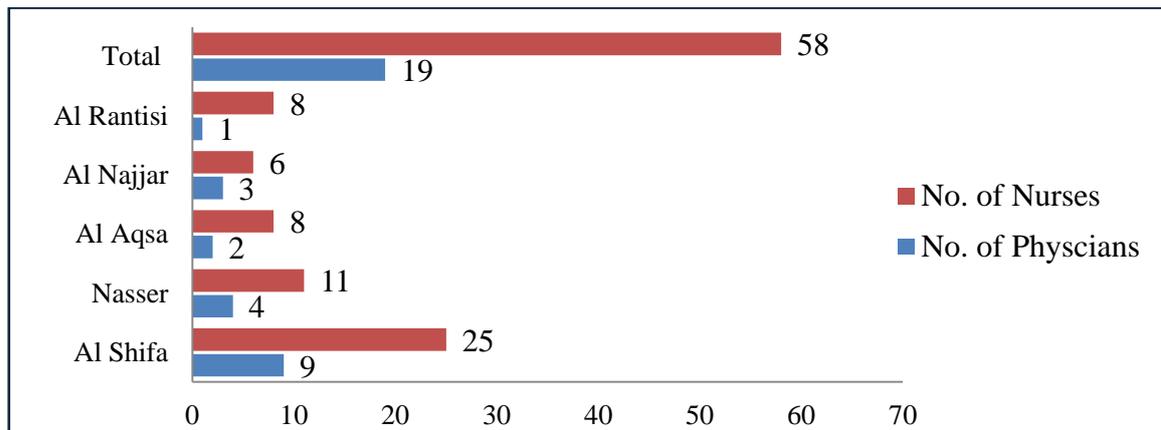
Figure 4.2: Distribution of study population according to place and type of work

The study results showed that (75.3%) of participants was nurses while physicians constituted 24.7%. Also, 44.2% of the study participants were working at Al Shifa medical complex, 19.5% of the study participants were working at Nasser hospital, 13% of the study participants were working at Al Aqsa hospital, 11.7% of the study participants were working at Al Najjar hospital, and 11.7% of the study participants were working at Al Rantisi hospital Fig. (4.2).

4.1.4   Health Care Provider's Attitude toward IPC Protocol:

Table 4.3: Health care provider's attitude toward IPC practice.

Variable	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree	Mean % of Positive Responses
1- IPC is important for HD unit						
No.	0	0	1	21	55	92.5
%	0	0	1.3	27.3	71.4	
2- Hand washing is important to prevent infections						
No.	0	0	1	17	59	93.75
%	0	0	1.3	22.1	76.6	
3- Using protective barriers decrease cross infection						
No.	0	0	1	26	50	91
%	0	0	1.3	33.8	64.9	
4- Proper handling of contaminated equipment prevents cross infection						
No.	1	0	1	27	48	89.25
%	1.3	0	1.3	35.1	62.3	
5- Routine cleaning and disinfecting of patient unit and equipment decrease cross infections						
No.	0	0	1	22	54	92.25
%	0	0	1.3	28.6	70.1	
6- Proper and safe waists disposal decreases or prevents infections						
No.	1	1	0	16	59	92.5
%	1.3	1.3	0	20.8	76.6	
Mean: 91.88 %				SD: 9.77		

As shown in Table (4.3), there was a positive attitude toward IPC protocol among the study participants working in the HD units; the attitude score of the study participants showed that the overall mean percentage was 91.88% (SD=9.77).

As shown in the Table (4.3), the majority of the study participants (98.7%) agreed or strongly agreed on the importance and necessity of IPC protocol for the work in the HD units. Only 1.3% of the study participants were uncertain on the benefits of IPC protocol for the work in the HD units. The mean percentage was 92.5%. Additionally, as shown in the Table (4.3), the vast majority of the study participants (98.7%) agreed or strongly agreed on the value and necessity of hand washing for the infection prevention and control.

Only 1.3% of the study participants were uncertain on the importance of hand washing for the infection prevention and control. The mean percentage was 93.75%.

Regarding the study participant's opinion about the fact that using protective barriers decrease cross infections, as shown in Table (4.3), the results showed that there is a positive attitude about benefit of using protective barriers in decreasing cross infections which was perceived by the vast majority of the study participants (98.7%). While only 1.3% of the study participants were uncertain of that. The mean percentage was 91%. Furthermore, as shown in the Table (4.3), 97.4% of the study participants agreed or strongly agreed that the fact that proper handling practice of contaminated equipment prevents cross infections. Only 2.6% of the study participants were either uncertain or strongly disagreed. The mean percentage was 89.25%.

Furthermore, as shown in the Table (4.3), the vast majority of the study participants (98.7%) agreed or strongly agreed that routine cleaning and disinfecting of patient hemodialysis unit and equipment decreases the cross infections, and only 1.3% of the participants were uncertain of that. The mean percentage was 92.25%.

Finally, the results of the study revealed that the vast majority of the study participants (97.4%) agreed or strongly agreed on the importance of proper and safe medical waste disposal procedures in decreasing or preventing infections, and only 2.6% of the study participants were either disagreed or strongly disagreed. The mean percentage was 92.5%.

4.1.5 Health Care Provider's Knowledge Towards IPC Protocol:

Table 4.4: Participants knowledge towards IPC protocol

Knowledge statements		Physicians		Nurse		Mean %	χ^2-value	P-value
		Yes	No	Yes	No			
Do you know about the universal IPC protocols	No.	12	7	34	24	60	0.122	0.472
	%	63.2	36.8	58.6	41.4			
Do you know about the Palestinian IPC protocols	No.	8	11	30	28	49.35	0.53	0.322
	%	42.1	57.9	51.7	48.3			
Do you know about the Palestinian IPC protocols for hemodialysis unit	No.	10	9	27	31	48.1	0.212	0.422
	%	52.6	47.4	46.6	53.4			
Do you have a copy of the Palestinian IPC protocols?	No.	3	16	14	44	22.1	0.572[•]	0.339
	%	15.8	84.2	24.1	75.9			
Does the hospital provide surveillance for HAI?	No.	8	11	24	34	41.6	0.003	0.581
	%	42.1	57.9	41.4	58.6			
Overall mean: 44.16% SD: 32.66								

[•]Fisher's Exact test

Concerning healthcare providers knowledge, the results revealed that there was inadequate knowledge about the special IPC protocol of the HD units; the knowledge score shows the overall mean of the study participant's was 44.16% (SD=32.66).

Regarding knowledge about the universal IPC protocol, as shown in about 60% of the study participants recognized the presence of the universal IPC protocol. However, there was no statistically significant difference among the study participants in the level of knowledge regarding their occupation with (χ^2=0.073, P=0.504) (Table 4.4).

The study results showed that nearly one-half (49.35%) of the study participants were knowledgeable about the presence of the Palestinian IPC protocols. The findings showed that there was no statistically significant difference among the study participants regarding their occupation with (χ^2=0.53, P=0.322).

Among the study participants, around one-half (48.1%) of the study participants (52.6% of physicians, 46.6% of nurses) knew the Palestinian IPC protocols for the hemodialysis units. There was no statistically significant difference in the knowledge about the Palestinian IPC protocols for the hemodialysis units among the study participants regarding their occupation with (χ^2=0.212, P=0.422).

Among the study participants, minority (22.1%) of the study participants (15.8% of physicians, 24.1% of nurses) confirmed that they have a copy of the Palestinian IPC protocols, while only 52.9% of the study participants knew where it is present. There was no statistically significant difference in possessing hard copy of the Palestinian IPC protocols among the study participants regarding their occupation with (χ^2=0.572, P=0.339).

As shown in Table (4.4), more than one third (41.6%) of the study participants (42.1% of physicians, 41.4% of nurses) knew that the hospital provide surveillance for HAI. Around one third of the study participants (31.6% of physicians, 34.5% of nurses) knew that the Infection Control Committee conduct the survey for HAI. There is no statistically significant difference among the study participants knowledge about the surveillance process in the hospitals for HAI regarding their occupation with (χ^2=.003, P=0.581).

This finding is consistent with many studies (Geroma, 2015; Sarani et al., 2014) which showed that around half of the study participants had poor knowledge about the IPC protocols.

From the researcher's perspective, the main reasons that could explain limited knowledge of the study participants are: (1). MoH did not implement training programs for physicians and nurses on the concept and content of IPC protocol for HD units; (2). IPC protocol related topics are not included in the educational curriculum of the faculties of medicine and nurse in the Palestinian universities; (3). The absence of IPC related topics in the training programs for newly recruited physicians and nurses; and (4). The limited availability hard copies of the IPC protocols within hospitals. Additionally, the researcher believes that the level of knowledge of the health care staff about the IPC concept and importance is inadequate and significant efforts must be made to increase that level of knowledge.

4.1.6 Participants' Practice towards IPC Protocol:

The study found that there was inadequate practice of participants and the IPC procedures in the HD units; the overall practice score of the study participants showed that the mean was 65.52% (SD=11.007), as shown in Table (4.5).

4.1.6.1 Participants' Education and Training Programs:

Table 4.5: Respondents' education and training towards IPC

Variable		Physicians		Nurse		Mean %	χ^2-value	P-value
		Yes	No	Yes	No			
Healthcare provider attend education session or training on IPC	No.	3	16	13	45	20.8	0.377[•]	0.398
	%	15.8	84.2	22.4	77.6			
The hospital provide information and updates to healthcare providers on IPC	No.	6	13	24	34	39	0.578	0.316
	%	31.6	68.4	41.4	58.6			
Overall mean: 29.87% SD: 35.596								

[•] Fisher's Exact test

As shown in Table (4.5), there were inadequate education and training programs for IPC for the study participants working in the HD units, The training score shows the overall mean of 29.87% (SD=35.596). Only 20.8% of the study participants (15.8% of physicians, 22.4% of nurses) received education or training session of IPC. However, about one third (39%) of the study participants (31.6% of Physicians and 41.4% of Nurses) reported that the hospital does not provide information and updates to healthcare providers about the IPC procedures.

This finding showed less level of training score than that reported by Eljedi & Dalo (2014) study. This difference can be attributed to the fact that several training courses were implemented related to the IPC targeting the health care staff working in the intensive care.

4.1.6.2 Wearing Uniform:
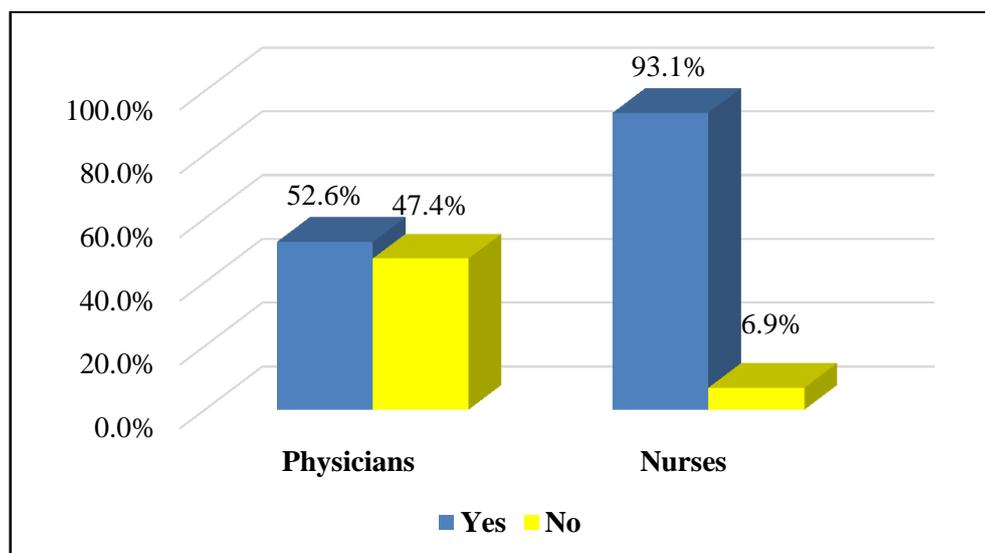
Figure (4.3): Distribution of participants' commitment to wear uniform during working time

With regard to the relationship between study participants occupation and commitment to wear formal uniform of the health care staff during working time, as shown in Fig. (4.3), the results showed that the majority (83.11%) of the study participants (52.6% of Physicians, 93.1% of Nurse) were committed to wear the formal uniform of the health care staff during working time. There was a statistically significant difference in the commitment to wear the formal uniform of health care staff among the study participants regarding their occupation with (χ^2=16.488, P=0.000) (Annex 10).

This finding is consistent with Eljedi & Dalo (2014) study. From the researcher's perspective, the main reason that could explain the high percentage of wearing uniform among the study participants is the fact that the nurses are highly compliant with wearing uniform, and the fact that nurses represents 75.3% of the health care staff working in the HD units.

4.1.6.3 Hand Washing Practice:

As shown in Table (4.6), the hand washing practice of the study participants in the HD units was insufficient. The hand washing practice score of the study participants' showed that the overall mean was 72.54 % (SD=15.495). The total mean score for physicians was 69.44%, while the total mean score for nurses was 74.11%.

This finding is consistent with several studies (Chenoweth et al., 2015; Shilpa et al., 2015; Lutfe et al., 2015; Fesharaki et al., 2014; Eljedi & Dalo, 2014).

Table 4.6: Respondents' hand wash practice towards IPC

Variable		Physicians		Nurse		Mean %	χ²-value	P-value
		+ve	-ve	+ve	-ve			
I wash my hands for 30-60 seconds using water and soap	No.	11	8	45	13	72.7	2.798	0.087
	%	57.9	42.1	77.6	22.4			
I remove jewelry, watch, and rings when washing my hands	No.	11	8	28	30	50.6	0.530	0.322
	%	57.9	42.1	48.3	51.7			
I wash my hands before contact with patients	No.	9	10	21	37	39	0.75	0.274
	%	47.4	52.6	36.2	63.8			
I wash my hands after any contact with patients	No.	15	4	45	13	77.9	0.015•	0.588
	%	78.9	21.1	77.6	22.4			
I wash my hands after any contact with blood, body fluids, secretions, and excretions	No.	19	0	57	1	98.7	0.328•	0.753
	%	100	0.0	98.3	1.7			
I wash my hands before disinfection for dressing, blood sampling ......etc	No.	11	8	32	26	55.8	0.043	0.526
	%	57.9	42.1	55.2	44.8			
I wash my hands after contact the patients surrounding	No.	17	2	53	5	90.9	0.062•	0.555
	%	89.5	10.5	91.4	8.6			
Overall mean: 72.54% SD:15.495								

• Fisher's Exact test; +ve : Always or Often; -ve = No, Rarely or Sometimes

Hand washing practice in HD unit was presented in Table (4.6), more than half (72.7%) of the study participants (57.9% of physicians, 77.6% of nurses) were washing hands for 30-60 seconds using water and soap. There was no statistically significant difference among the study participants duration of hand washing practice for more than 30 seconds regarding their occupation with (χ²=2.798, P=0.087). This finding is consistent with Eljedi & Dalo (2014) study

As shown in the Table (4.6), around one half (50.6%) of the study participants (57.9% of physicians, 48.3% of nurses) were removing jewelries, watches, and rings when washing

their hands. There was no statistically significant difference among the study participants practice of removing jewelries, watches, and rings during washing their hands regarding their occupation with (χ^2=0.530, P=0.322). This finding is consistent with Eljedi & Dalo (2014) study.

The results of the study revealed that more than one third (39%) of the study participants (47.4% of physicians, 36.2% of nurses) were washing their hands properly before contact with patients, as shown in the Table (4.6). There was no statistically significant difference among participants hand washing practice before contact with patients regarding their occupation with (χ^2=0.75, P=0.274). This finding is consistent with Fesharaki and colleagues (2014) study, while it is inconsistent with Eljedi & Dalo (2014) study. However, two third (77.9%) of the study participants (78.9% of physicians, 77.6% of nurses) were washing their hands after any contact with patients. This finding showed that there was no statistically significant difference among the study participants practice of hands after any contact with patients regarding their occupation with (χ^2=0.015, P=0.588). This finding is consistent with Fesharaki and colleagues (2014) study, while it is lower than that reported by Eljedi & Dalo (2014) study. Furthermore, as shown in Table (4.6), the vast majority (98.7%) of the study participants (100% of physicians, 98.3% of nurses) were washing their hands after any contact with blood, body fluids, secretions, and excretions. There is no statistically significant difference among the study participants practice of hands after any contact with blood, body fluids, secretions, and excretions regarding their occupation with (χ^2=0.328, P=0.753).

Regarding the study participants hand wash practice in HD unit before contacting skin of patients for dressing, blood sampling, as shown in Table (4.6), around one half (55.8%) of the study participants (57.9% of physicians, 55.2% of nurses) were washing their hands before contacting skin of patients for dressing, blood sampling. There was no statistically significant difference among the study participants practice of washing their hands before contacting skin of patients for dressing, blood sampling regarding their occupation with (χ^2=0.043, P=0.526). The majority (90.9%) of the study participants (89.5% of physicians, 91.4% of nurses) were washing their hands after contacting the patient's surroundings, as shown in Table (4.6). The findings showed no statistically significant difference among the study participants practice of hand washing after contacting the patients surroundings regarding their occupation with (χ^2=0.062, P=0.555).

4.1.6.4 Wearing Gloves:

Table 4.7: Respondents' wearing gloves practice towards IPC

Variable		Physicians		Nurse		Mean %	χ^2-value	P-value
		+ve	-ve	+ve	-ve			
I wear gloves when contact with blood, body fluids, secretion and excretion	No.	18	1	46	12	83.1	2.396•	0.109
	%	94.7	5.3%	79.3	20.7			
I wear sterile gloves for invasive procedures	No.	18	1	43	15	88.3	3.641•	0.047*
	%	94.7	5.3	74.1	25.9			
I wear gloves when handling contaminated instrument	No.	18	1	50	8	79.2	0.996•	0.292
	%	94.7	5.3	86.2	13.8			
Overall mean: 82.14% SD:20.97								

• Fisher's Exact test; * Statically Significant; +ve : Always or Often; -ve = No, Rarely or Sometimes

As shown in Table (4.7), The wearing gloves score shows the overall mean of the study participant's was 82.14% (SD=20.97) This finding is consistent with Eljedi & Dalo (2014) study and it is much higer than that observed by Chalya and colleagues (2015).

There are three types of gloves: sterile gloves that are used in septic sterile procedures, latex gloves which are used to protect the study participants from cross infection when they anticipate to contact blood or any other body fluid, or when they want to contact used patient care equipment, and heavy duty gloves that usually used when contact disposables, as shown in Table (4.7).

The results of the study revealed that the majority (83.1%) of the study participants (94.7% of Physicians, 79.3% of Nurse) wearing gloves when contact with blood or other body fluids. This finding is consistent with Eljedi & Dalo (2014) study.

However, 88.3% of the study participants (94.7% of Physicians, 86.2% of Nurse) were wearing gloves when handling contaminated instruments and only 79.2% of the study participants (94.7% of Physicians, 74.1% of Nurse) were wearing sterile gloves for

invasive procedures, as shown in Table (4.7). There was statistically significant difference among participants practice of wearing sterile gloves for invasive procedures regarding their occupation with (χ^2=3.641, P=0.047). This finding is consistent with Eljedi & Dalo (2014) study.

4.1.6.5   Injury from Used Sharps:
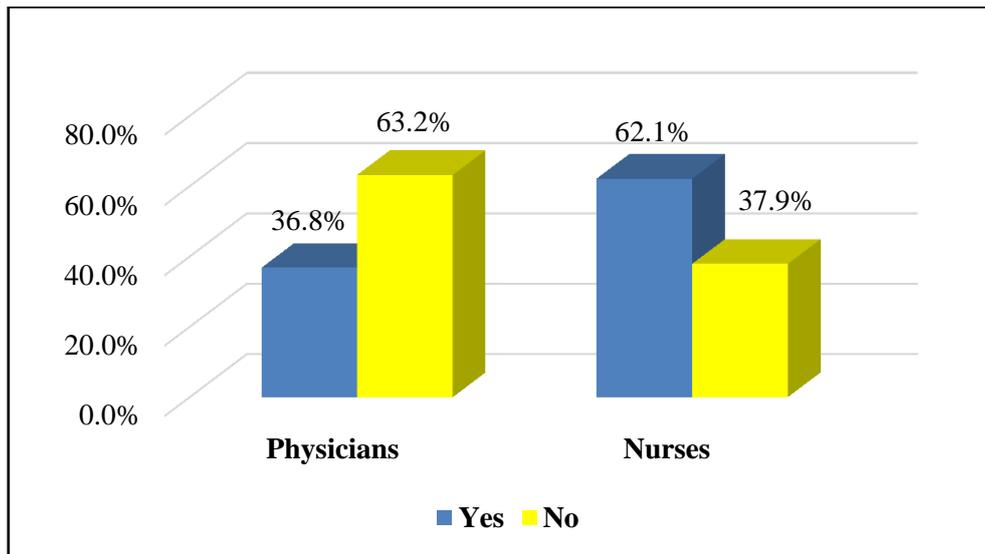
Figure 4.4: Distribution of participants' injury during working time

As shown in Fig. (4.4), the study results revealed that around half (55.8%) of the study participants (36.8% of Physicians, 62.1% of Nurse) were exposed to an injury from used needle or sharp medical instrument. There was statistically significant difference among the study participants in the history of injury from needle or sharp medical instrument regarding their occupation with (χ^2=3.694, P=0.049) (Annex 11). This finding is consistent with several studies (Ismail et al., 2007; Eljedi & Dalo, 2014; Chalya et al., 2015).

4.1.6.6 Using Safe Sharp Disposable Practices:

Table 4.8: Respondents' compliance towards safe sharp disposable practice

Variable		Physicians		Nurse		Mean %	χ²-value	P-value
		+ve	-ve	+ve	-ve			
Used needles and syringes are discarded in to safety box	No.	10	9	15	43	32.5	4.677	0.032*
	%	52.6	47.4	25.9	74.1			
I do not recap, break or bend the used needle before disposal	No.	6	13	31	27	48.1	2.742	.081
	%	31.6	68.4	53.4	46.6			
I do not separate used needle from syringe before disposal	No.	0	19	7	51	9.1	2.49	0.125
	%	0.0	100	12.1	87.9			
Waste materials are separated according to bags color guide	No.	7	12	19	39	33.8	0.107	0.475
	%	36.8	63.2	32.8	67.2			
Overall mean:41.88% SD:11.2								

•Fisher's Exact test; * Statically Significant; +ve : Always or Often; -ve = No, Rarely or Sometimes

As shown in Table (4.8), there was high risk for the study participants injury during the sharp disposal practice in the HD units; the safe sharp disposal practice score of the study participant's shows the overall mean was 41.88% (SD=11.2).

Concerning the safe sharp disposable practices of the study participants, as shown in Table (4.8), the study results showed that only 48.1% of the study participants (31.6% of Physicians, 53.4% of Nurses) follows the recommendation of the IPC protocol in avoiding recapping, breaking or bending used needles before disposal. Only 9.1% of the study participants (0% of Physicians, 12.1% of Nurse) discarded the used syringes without removing its needle. Additionally, 32.5% of the study participants (52.6% of Physicians, 25.9% of Nurses) always dispose used needles and syringes in safety box. Only 33.8% of the study participants (36.8% of Physicians, 32.8% of Nurses) separate waste material according to bags color guide, as shown in Table (4.8). This finding was consistent with Tabash study (2016) and in consistent with Qeshta study (2016). These findings showed a statistically significant difference among participants in disposing used needles and

syringes safely in safety boxes regarding their occupation in favor for physicians with (χ^2=4.677, *P*=0.032).

4.1.6.7 Vaccination:

4.1.6.7.1 Vaccination of Study Participants:

Table 4.9: Study Participant vaccination for HB

Variable		Physicians		Nurse		Mean %	χ^2-value	*P*-value
		Yes	No	Yes	No			
Have you received HB Vaccine?	No.	16	3	56	2	93.5	3.543•	0.093
	%	84.2	15.8	96.6	3.4			
Did you examine Ab titter for HB vaccine?	No.	4	15	10	48	18.2	0.138•	0.472
	%	21.1	78.9	17.2	82.8			
Overall mean: 55.84%				SD: 24.29				

• Fisher's Exact test;

As shown in Table (4.9), there was inadequate vaccination the health care providers working in the HD units; the vaccination score of the study participant's shows the overall mean was 55.84% (SD=24.29).

The study results, as shown in Table (4.9), revealed that 93.5% of the study participants' (84.2% of Physicians, 96.6% of Nurses) received vaccination for hepatitis B. Only 67.5% of the study participants (52.6% of Physicians, 72.4% of Nurses) received the recommended three doses that ensure highest protection level for health care provider from cross infection. The finding of the focus group explained that there was no adopted policy for HCP's vaccination, as a result, there was low level of HCP's compliance with full dose of hepatitis B vaccine. Furthermore, only 18.2% of the study participants (21.1% of Physicians, 17.2% of Nurses) examined the antibodies titter for hepatitis B vaccine. The study showed that there was no statistically significant difference among the study participants in having HB vaccination regarding their occupation with (χ^2=3543, *P*=0.093) and examining AB titter (χ^2=0.138, *P*=0.472). The focus group finding showed a conflict between the central committee for infection control and the department of preventive medicine in the definition of HB virus vaccination steps necessary for protecting the health

care provider working in the hemodialysis units which can be considered as the main reason for not examining the antibodies titter for hepatitis B vaccine for the study participants. This finding is consistent with several studies (Elzouki et al., 2014; Eljedi & Dalo, 2014).

4.1.6.7.2 Vaccination of Hemodialysis Patients:

Table 4.10: Hemodialysis patients' vaccination for HB

Variable		Physicians		Nurse		Mean %	χ^2-value	P-value
		+ve	-ve	+ve	-ve			
Examine patients for HB and HIV before dialysis	No.	13	6	22	36	45.5	5.366	0.02*
	%	68.4	31.6	37.9	62.1			
Give hepatitis free Patients three doses of hepatitis B vaccine	No.	16	3	51	7	87	0.173•	0.469
	%	84.2	15.8	87.9	12.1			
Overall mean: 50.97% SD: 21.07								

• Fisher's Exact test; * Statically Significant; +ve : Always or Often; -ve = No, Rarely or Sometimes

As shown in Table (4.10), there was low level of practice of the study participants in the HD units regarding vaccination for hemodialysis patients; the score of hemodialysis patient vaccination implemented by the health care providers in the HD units shows the overall mean of the practice was 50.97% (SD=21.07), the results also showed that around half (45.5%) of the study participants (70% of Physicians, 37.9% of Nurses) were examining patients for HB and HIV before dialysis. This findings showed a statistically significant difference among the study participants practice in examining patients for HB and HIV regarding their occupation (χ^2= 5.366, P=0.02).

The results confirmed that 87% of hemodialysis patients were given three doses of hepatitis B vaccine for non-infected patients. There was no statistically significant difference among the study participants in the practice of providing vaccination for patients regarding their occupation with (χ^2= 0.173, P=0.469).

4.1.6.8 Using Antiseptics and Disinfectants:

Table 4.11: Participants compliance toward using antiseptics

Variable		Physicians		Nurse		Mean %	χ²-value	P-value
		+ve	-ve	+ve	-ve			
Using disinfectants in cleaning patient unit	No.	18	1	49	9	87	1.314•	0.232
	%	94.7	5.3	84.5	15.5			
Using disinfectant in cleaning walls weekly	No.	13	6	26	32	50.6	3.187	0.063
	%	68.4	31.6	44.8	55.2			
Using disinfectant in cleaning patient bed between patients	No.	18	1	53	5	92.2	0.222•	0.538
	%	94.7	5.3	91.4	8.6			
Disinfect internal parts of hemodialysis machine according to company instruction	No.	19	0	52	6	92.2	2.104•	0.171
	%	100	0.0	89.7	10.3			
Disinfect all instrument after the end of hemodialysis and before using to other patient	No.	13	6	23	35	46.8	4.757	0.027*
	%	68.4	31.6	39.7	60.3			
Overall mean: 77.01% SD: 16.96								

• Fisher's Exact test; * Statically Significant; +ve : Always or Often; -ve = No, Rarely or Sometimes

As shown in Table (4.11), there was an inadequate disinfectants and antiseptics practice in the HD units; the using antiseptics and disinfectants practice score of the study participant's shows the overall mean was 77.01% (SD=16.96).

The IPC protocol recommended using disinfectant solutions in cleaning surfaces when contaminated with blood, other body fluids, any place used for procedures, or visibly soiled including patient unit and patient room is present. The results showed in Table (4.11) revealed that 87% of study participants' (94.7% of Physicians, 84.5% of Nurses) using disinfectants in cleaning patient unit. This finding is consistent with Eljedi & Dalo (2014) study.

Nearly half (50.6%) of the study participants (68.4% of Physicians, 44.8% of Nurses) confirmed that the cleaning of walls using disinfectant is done weekly. The majority (92.2%) of the study participants (94.7% of Physicians, 91.4% of Nurses) confirmed cleaning the bed between patients by using disinfectant. The internal parts of the

hemodialysis machine are disinfected as recommended by company's instruction as stated by 92.2% of the study participants (100% of Physicians, 89.7% of Nurses). Only 46.8% of the study participants (68.4% of Physicians, 39.7% of Nurses) confirmed that all instrument was disinfected after the end of hemodialysis session for a patient and before starting new session for another patient. There was a statistically significant difference among the study participants practice in using only disinfected instrument when starting new session for a patient regarding their occupation with (χ^2=4.757, P=0.027). This finding is identical with those findings of Moghaddam and colleagues (2012) and Awad (2009) astudies.

4.1.6.9 Isolating Patients with Known Blood Borne Diseases:
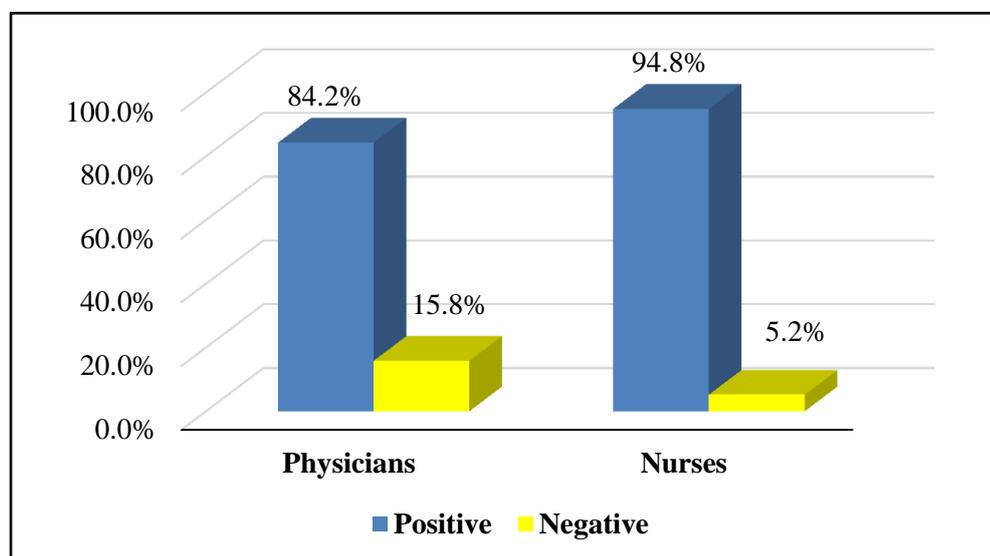
Figure 4.5: Distribution of isolation of patients with known blood borne diseases

The study showed that (92%) of the study participants (84.2% of Physicians, 94.8% of Nurses) reported that they were isolating infected patient with blood borne diseases in separate hemodialysis machine. This finding showed that there was no statistically significant difference among the study participants practice in isolating infected patient in separate hemodialysis machine regarding their occupation with (χ^2=2.216, P=0.156) (Annex 12). This finding is consistent with that of Eljedi & Dalo (2014) study.

4.1.6.10 Sterility of Instruments and Invasive Procedures:

The study showed that (37.3%) of the study participants (57.9% of Physicians, 30.4% of Nurses) perceived that they use sterile equipment in sterile way for invasive procedures.

This finding showed that there was statistically significant difference among the study participants practice in use sterile equipment in sterile way for invasive procedures regarding their occupation with (χ^2=4.598, *P*=0.032). This finding is contradicting with that of Eljedi & Dalo (2014) study.

4.1.6.11 Protect Hemodialysis Patients from Visitors:
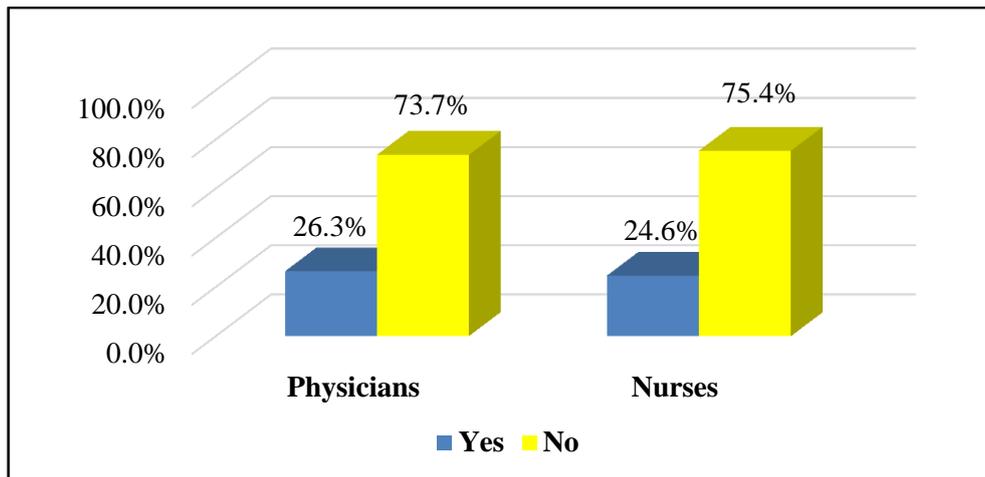
Figure 4.6: Distribution of study participants practice in protection of patients from visitors

Regarding the visitors protective measures, as shown in Figure (4.6), about 25% of the study participants (26.3% of Physicians, 24.6% of Nurses) said that the visitors are provided with protective measures before entering the HD unit. The findings showed that there was no statistically significant relationship among participants regarding their occupation with (χ= 0.023, P=0.550) (Annex13). This finding is much lower than that of Eljedi & Dalo (2014) study. Based on the results of this question, we can strongly conclude that the health care staff and the hospital management does not completely perform its assigned role in controlling the entrance of visitors to the HD units. This is probably due to several reasons, including wrong community culture, lack of commitment of the hospital management and monitoring and evaluation directorate to improve the quality provided in this critical service.

4.1.7 Barriers for Compliance with IPC Protocol:
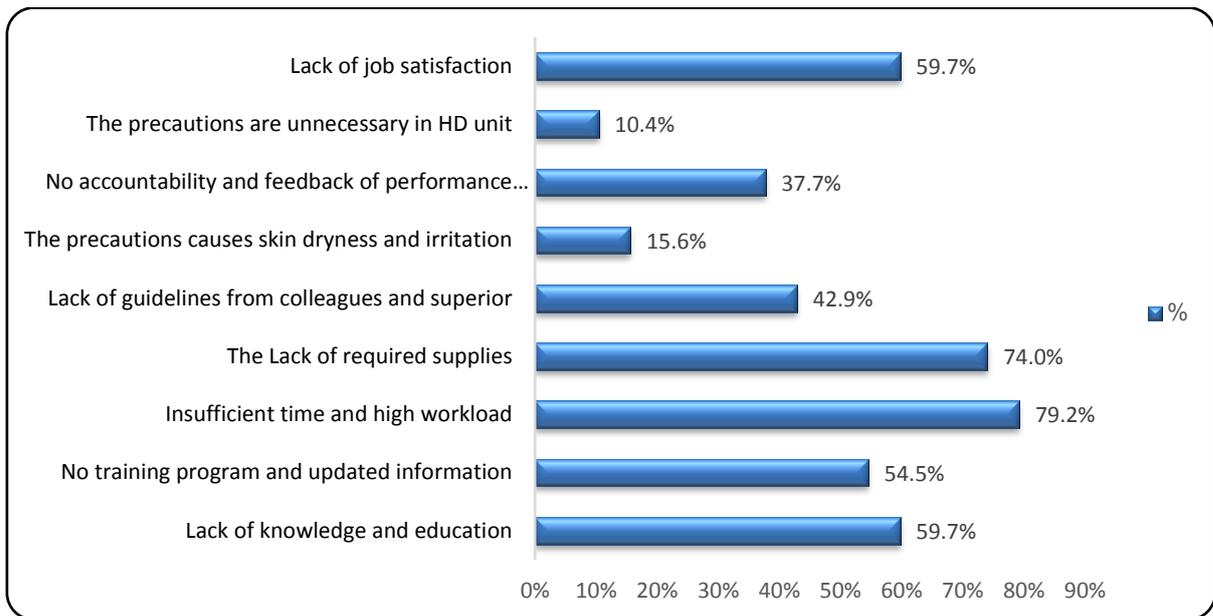
Figure 4.7: Barriers for IPC protocol compliance

Regarding the expected barriers that might prevent health care provider's working in the HDunits from being compliant with IPC protocol, as shown in Fig. (4.7). The study results revealed that 79.2% of the study participants defined insufficient time and high workload as the main barrier for compliance with IPC protocol, 74.03% of the study participants define the Lack of required supplies as the a main barrier for compliance with IPC protocol in the HD units. Also, 59.74% of the study participants referred the low level of compliance with IPC protocol in the HD units to the lack of knowledge and education, 59.74% of the study participants referred the low level of compliance with IPC protocol in the HD units to lack of job satisfaction, 54.55% of the study participants referred the low level of compliance with IPC protocol in the HD units to the inadequate training program and lack of updated information, 42.86% of the study participants reported the lack of guidelines from colleagues and superior as the main reason for the low level of compliance with IPC protocol in the HD units. 37.66% of the study participants informed that the absence of accountability and feedback of performance from administration is the main reason for the low level of compliance with IPC protocol in the HD units, only 15.58% of the study participants perceived that these precautions causes skin dryness and irritation as the main reason for the low level of compliance with IPC protocol in the HD units, and only 10.39% of the study participants says that these precautions are not necessary for the

work in the HD units. The above mentioned barriers were consistent with that of the focus group.

This finding is consistent with Travers and colleagues (2015) in considering the absence of training, increased workload, and lack accountability as the main constrains for implementing and maintaining IPC practice. Moreover, the study findings is also consistent with that of Eljedi & Dalo (2014) local study in considering the lack of training programs, lack of knowledge, scarcity of supplies, increased workload, and lack accountability as barrier for good IPC compliance. Additionally, the researcher see that the hi percentage of lack of job satisfaction can be attributed to the low level of income due to the halt in salary payments as a result of the Palestinian political conflict.

4.1.8 Inferential Statistics of the Self-administered Questionnaire:

Table 4.12: Inferential statistics related to hospitals in the self-administered questionnaire findings

Variable	Hospital	Mean	Std. Deviation	F value	Sig.
Attitude Score	Al Shifa	91.54	9.42839	0.995	0.416
	Nasser	88.33	12.71638		
	Al Aqsa	94.58	6.8183		
	Al Najjar	92.59	8.53348		
	Al Rantisi	95.37	9.18664		
Knowledge Score	Al Shifa	38.82	30.328	1.18	0.327
	Nasser	58.67	34.198		
	Al Aqsa	50	35.59		
	Al Najjar	40	42.426		
	Al Rantisi	37.78	21.082		
Training Score	Al Shifa	17.65	32.292	7.012	0.000*
	Nasser	66.67	30.861		
	Al Aqsa	20	34.96		
	Al Najjar	22.22	26.352		
	Al Rantisi	33.33	25		
Hands Washing Practice Score	Al Shifa	67.12	15.349	3.765	0.008*
	Nasser	79.05	14.02		
	Al Aqsa	67.86	15.058		
	Al Najjar	75.79	13.69		
	Al Rantisi	84.13	11.31		
Wearing Gloves Score	Al Shifa	75.49	24.095	2.43	0.055
	Nasser	90.56	16.019		
	Al Aqsa	77.5	23.911		
	Al Najjar	89.81	9.108		
	Al Rantisi	90.74	10.577		
Waste Disposal Practice Score	Al Shifa	40.62	10.11885	2.147	0.084
	Nasser	44.16	10.15138		
	Al Aqsa	43.12	9.52427		
	Al Najjar	48.61	13.89757		
	Al Rantisi	34.72	12.92674		
Vaccination Score	Al Shifa	54.41	25.72479	0.756	0.557
	Nasser	53.33	22.88689		
	Al Aqsa	50	23.57023		
	Al Najjar	61.11	22.04793		
	Al Rantisi	66.66	25		
Disinfectant Score	Al Shifa	79.85	16.7642	2.12	0.087
	Nasser	75.33	16.19818		
	Al Aqsa	69.5	16.7415		
	Al Najjar	86.11	14.74317		
	Al Rantisi	68.33	17.13914		
Practice Score	Al Shifa	61.6	11.041	3.64	0.01*
	Nasser	70.92	6.721		
	Al Aqsa	62.89	11.826		
	Al Najjar	74.5	10.73		
	Al Rantisi	66.13	8.61		

Table 4.13: Inferential statistics related to the occupation in the self-administered questionnaire findings

Variable	Occupation	Mean		Std. Deviation	t	Sig.
Attitude Score	Physician	94.51	91.88	8.10481	1.362	0.177
	Nurse	91.02		10.17038		
Knowledge Score	Physician	43.16	44.16	36.064	0.152	0.879
	Nurse	44.48		31.798		
Training Score	Physician	23.68	29.87	30.589	0.871	0.386
	Nurse	31.90		37.109		
Hands Washing Practice Score	Physician	69.74	72.54	17.990	0.908	0.367
	Nurse	73.46		14.643		
Wearing Gloves Score	Physician	90.79	82.14	12.390	2.802	0.007*
	Nurse	79.31		22.472		
Waste Disposal Practice Score	Physician	43.75	41.88	11.02396	0.835	0.406
	Nurse	41.27		11.28647		
Vaccination Score	Physician	52.63	55.84	31.06304	0.662	0.51
	Nurse	56.89		21.86136		
Disinfectant Score	Physician	85.52	77.01	13.93385	2.616	0.011*
	Nurse	74.22		17.03458		
Practice Score	Physician	67.50	65.52	11.789	0.89	0.377
	Nurse	64.80		10.741		

* Statistically Significant

Regarding attitude score of the health care providers working in the HD units toward the IPC protocol, which was obtained from the self-administered questionnaire, as shown in Table (4.12), the study revealed a high level of positive attitude among the health care providers, the overall mean score of attitude among the health care providers working in the HD units was 91.88%. The highest attitude score was reported at Al Rantisi hospital with a mean score of 95.37%, while the lowest attitude score was reported at Nasser hospital with a mean score of 88.33%. Moreover, it was observed that the attitude score of physicians working in the HD unit was higher than that of nurses (physicians mean score of attitude was 94.52%, Nurse mean score of attitude was 91.02%), as shown in Table (4.13). One way Anova test was conducted to examine the presence of statistically significant differences among the study settings concerning the attitude score of the study

participants. As shown in Table (4.12), there was no statistically significant difference in the attitude score of the study participants among the study settings with (F=0.995, *P* value=0.416). Moreover, there was no statistically significant differences in attitude score of the study participants regarding their occupation (t Test=1.362, *P* value=0.177), as shown in Table (4.13).

Regarding Knowledge score about the IPC protocol of the health care providers working in the HD units which was obtained from the self-administered questionnaire, the study showed that there was a low level of Knowledge score about the IPC protocol among the health care providers. The overall mean score of Knowledge score of the study participants about the IPC protocol working in the HD units was 44.16%. The highest Knowledge score about the IPC protocol was reported at Nasser hospital with a mean score of 58.67%, while the lowest Knowledge score about the IPC protocol was reported at Al Rantisi hospital with a mean score of 37.78%. Moreover, it was observed that the Knowledge score of physicians working in the HD unit about the IPC protocol was lower than that of nurses (Physicians mean score of Knowledge was 43.16%, Nurses mean score of Knowledge was 44.48%), as shown in Table (4.13). One way Anova test was conducted to examine the presence of statistically significant differences among the study settings concerning the Knowledge score of the study participants, as shown in Table (4.12), there was no statistically significant difference in the Knowledge score of the study participants among the study settings with (F=1.18, *P* value=0.327). Moreover, there was no statistically significant differences in Knowledge score of the study participants regarding their occupation (t Test=0.152, *P* value=0.879), as shown in Table (4.13).

Regarding the training score about IPC protocol among the health care providers working in the HD units, which was obtained from the self-administered questionnaire, as shown in Table (4.12). The study found that there was a low level of training score among the health care providers working in the HD units, the overall mean score of training among the study participants working in the HD units was 29.87%. The highest perceived training score was reported at Nasser hospital with a mean score of 66.67%, while the lowest perceived training score was reported at Al Shifa medical complex with a mean score of 17.65%. Moreover, it was observed that the training score of physicians working in the HD unit was lower than that of nurses (Physicians mean of training score was 23.68%, Nurses mean of training score was 31.9%), as shown in Table (4.13). One way Anova test was conducted to examine the presence of statistically significant differences among the study settings

concerning the training score of the study participants. As shown in Table (4.12), there was a strong statistically significant difference in the training score of the study participants regarding the study settings with (F=7.012, *P* value=0.000). Moreover, Post Hoc - Bonfirroni test has revealed that the significant difference in the training score of the study participants was observed between Nasser and other three hospitals: Al Aqsa hospital (Sig.=0.004), Al Shifa medical complex (Sig.=0.000), and Al Najjar hospital (Sig.=0.011), indicating that the training score of the study participants at Nasser hospital is higher than the other three mentioned hospitals. Moreover, there was no statistically significant differences in training score among the study participants regarding their occupation (t Test=0.871, P value=0.386), as shown in Table (4.13).

Regarding the perceived hand washing practice score of the study participants working in the HD units about the IPC protocol, which was obtained from the self-administered questionnaire, as shown in Table (4.12), the study results revealed an inadequate level of perceived hand washing practice score among the health care providers, the overall mean of the perceived hand washing practice score among the study participants working in the HD units was 72.54%. The highest perceived hand washing practice score was reported at Al Rantisi hospital with a mean score of 84.13%, while the lowest perceived hand washing practice score was reported at Al Shifa medical complex with a mean score of 67.12%. Moreover, it was observed that the perceived hand washing practice score of physicians working in the HD unit was lower than that of nurses (Physicians mean score of hand washing practice was 69.74%, Nurses mean score of hand washing practice was 73.46%), as shown in Table (4.13). One way Anova test was conducted to examine the presence of statistically significant differences among the study settings concerning the perceived hand washing practice score of the study participants. As shown in Table (4.12), there was strong statistically significant difference in the perceived hand washing practice score of the study participants among the study settings with (F=3.765, *P*-value=0.008). Moreover, Post Hoc - Bonfirroni test has revealed that the significant difference in the hand washing practice score was observed between Al Shifa and Al Rantisi hospital (Sig.=0.025), indicating that the perceived hand washing practice at Al Rantisi hospital is higher than at Al Shifa medical complex. Moreover, there was no statistically significant differences in the perceived hand washing practice among the study participants regarding their occupation (t Test=0.908, P value=0.367), as shown in Table (4.13).

Regarding the perceived wearing gloves practice score of the study participants working in the HD units, as shown in Table (4.12), which was obtained from the self-administered questionnaire, the study showed an inadequate level of perceived wearing gloves practice score among the health care providers, the overall mean score of perceived wearing gloves practice score among the study participants working in the HD units was 82.14%. The highest perceived wearing gloves practice score was reported at Al Rantisi hospital with a mean score of 90.74%, while the lowest perceived wearing gloves practice score was reported at Al Shifa medical complex with a mean score of 75.49%. Moreover, it was observed that the perceived wearing gloves practice score of physicians working in the HD unit was higher than that of nurses (Physicians mean score of wearing gloves practice was 90.79%, Nurses mean score of wearing gloves practice was 79.31%), as shown in Table (4.13). One way Anova test was conducted to examine the presence of statistically significant differences toward wearing gloves practice score of the study participants working in the HD units among the study settings. As shown in Table (4.12), there was no statistically significant difference toward wearing gloves practice score of the study participants working in the HD units among the study settings with (F=2.43, *P* value=0.055). Moreover, there was a statistically significant difference in wearing gloves practice of the study participants working in the HD units regarding their occupation (t Test=2.802, *P* value=0.007), as shown in Table (4.13).

Regarding waste disposal practice score of the study participants working in the HD units which was obtained from the self-administered questionnaire, as shown in Table (4.13), the study confirmed low level of waste disposal practice score among the health care providers, the overall mean score of the study participants perceived waste disposal practice score among the HD units was 41.88%. The highest perceived waste disposal practice score the study participants was reported at Al Najjar hospital with a mean score of 48.61%, while the lowest perceived waste disposal practice score the study participants was reported at Al Rantisi hospital with a mean score of 34.72%. Moreover, it was observed that waste disposal practice score of physicians working in the HD unit was slightly higher than that of nurses (Physicians mean waste disposal practice score was 43.75%, Nurse mean waste disposal practice score was 41.27%), as shown in Table (4.13). One way Anova test was conducted to examine the presence of statistically significant differences in the perceived waste disposal practice score among the study participants. As shown in Table (4.12), there was no statistically significant difference in the perceived

waste disposal practice score of the study participants among the study settings with (F=2.147, *P* value=0.084). Moreover, there was no statistically significant differences in waste disposal practice among the study participants regarding their occupation (t Test=0.835, *P* value=0.406), as shown in Table (4.13).

Regarding the vaccination score of the study participants working in the HD units which was obtained from the self-administered questionnaire, as shown in Table (4.12), the study found that there was a low level of vaccination score among the health care providers working in the HD units. The overall mean of vaccination score of the study participants among the HD units was 55.84%. The highest vaccination score of the study participants was reported at Al Rantisi hospital with a mean score of 66.66%, while the lowest vaccination score of the study participants was reported at Al Aqsa hospital with a mean score of 50.0%. Moreover, it was observed that the vaccination score of physicians working in the HD unit was lower than that of nurses (Physicians mean of vaccination score was 52.63%, Nurses mean of vaccination score was 56.89%), as shown in Table (4.13). One way Anova test was conducted to examine the presence of statistically significant differences in mean of vaccination score of the study participants working in the HD units among the study settings. As shown in Table (4.13), there was no statistically significant difference in the vaccination score of the study participants among the study settings with (F=.756, P value=0.557). Moreover, there was no statistically significant differences in the mean of vaccination score of the study participants regarding their occupation (t Test=0.662, P value=0.51), as shown in Table (4.13).

Regarding disinfectant usage score of the study participants working in the HD units which was obtained from the self-administered questionnaire, as shown in Table (4.12), the study found that there was an inadequate level of disinfectant usage score of the study participants working in the HD units, the overall mean score of disinfectant usage score of the study participants among the HD units was 77.01%. The highest disinfectant usage score was reported at Al Najjar hospital with a mean score of 86.11%, while the lowest disinfectant usage score was reported at Al Rantisi hospital with a mean score of 68.33%. Moreover, it was observed that the perceived disinfectant usage score of physicians working in the HD unit was higher than that of nurses (Physicians mean score of disinfectant usage was 85.52%, Nurses mean score of disinfectant usage was 74.22%), as shown in Table (4.13). One way Anova test was conducted to examine the presence of statistically significant differences in the perceived disinfectant usage score among the

study settings. As shown in Table (4.12), there was no statistically significant difference in disinfectant usage score of the study participants among the study settings with (F=2.12, *P* value=0.087). Moreover, there was statistically significant differences in disinfectant usage score of the study participants regarding their occupation (t Test=2.616, *P* value=0.011), as shown in Table (4.13).

Regarding the overall practice score of the health care providers working in the HD units about IPC protocol, which was obtained from the self-administered questionnaire, as shown in Table (4.13), the study showed low level of overall practice score among the study participants working in the HD units, the overall mean score of practice score of the study participants among the HD units was 65.52%. The highest overall practice score of the study participants was reported at Al Najjar hospital with a mean score of 74.5%, while the lowest overall practice score of the study participants was reported at Al Shifa medical complex with a mean score of 61.6%. Moreover, it was observed that the overall practice score of physicians working in the HD unit was higher than that of nurses (Physicians overall mean of practice score was 67.5%, Nurses overall mean of practice score was 64.8%), as shown in Table (4.13). One way Anova test was conducted to examine the presence of statistically significant differences in the overall practice score of the study participants among the study settings. As shown in Table (4.12), there was a statistically significant difference in the perceived overall practice score of the study participants among the study settings with (F=3.64, *P* value=0.01). Post Hoc - Bonfirroni test has revealed that the significant difference in overall practice score was observed between Al Shifa and Al Najjar hospital (Sig.=0.024), indicating that the overall practice at Al Shifa medical complex is less than that at Al Najjar hospital. Moreover, there was no statistically significant differences in overall practice score of the study participants regarding their occupation (t Test=0.89, P value=0.377), as shown in Table (4.13).

4.2 Observational Checklists

4.2.1 Healthcare Providers Practice Observational Checklist:

The checklist included the following: wearing uniform, hand washing, wearing gloves, antiseptics and disinfectant, and sharp disposal. The checklists filled three times for each of HCP in different working shifts working in the HD units to observe the actual practices at all HCPs in relation to IPC and the results presented and discussed in details as follows.

4.2.1.1 Wearing Uniform:
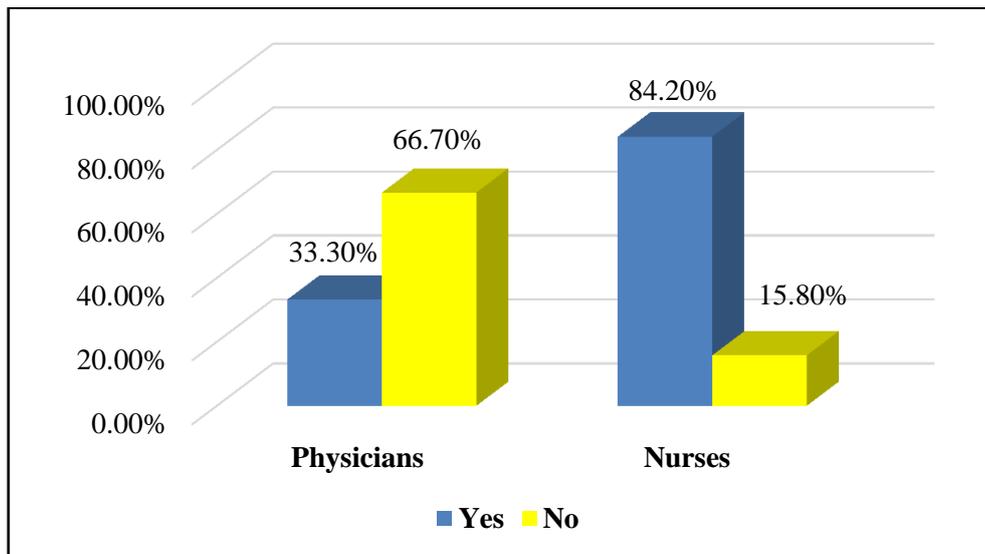
Figure 4.8: Distribution of participants' commitment to wear uniform during working time

As shown in Fig. (4.8), the observational results of checking the compliance of the study participants with wearing the formal health care providers uniform confirmed that only 71.5% of the study participants (33.3% of Physicians, 84.2% of nurses) were committed wearing the formal uniform of the health care staff during working time. This findings showed a statistically significant difference among the study participants practice to wear the formal uniform of the health care staff during working time regarding their occupation (χ^2=54.294, *P*=0.000) (Annex14). This finding is lower than that found in the observational checklist of Eljedi & Dalo (2014) study. Moreover, the researcher found that the percentage of wearing uniform compliance based on the observational checklist was lower than that reported in the self-administered questionnaires.

4.2.1.2   **Hand Washing**:

Table 4.14: Study participants hand washing practice compliance according to the observational checklist

Variable		Physicians		Nurse		Mean %	χ^2-value	P-value
		Yes	No	Yes	No			
Hands were rubbed under running water (30- 60) seconds.	No.	32	25	98	73	57	0.024	0.499
	%	56.1	43.9	57.3	42.7			
Removing jewelry, hand watch, and ring when washing hands	No.	9	48	52	119	26.8	4.663	0.021*
	%	15.8	84.2	30.4	69.6			
Hand washing before touching the patients	No.	3	54	21	150	10.5	2.235	0.102
	%	5.3	94.7	12.3	87.7			
Hand washing after touching blood or body fluids	No.	57	0	169	2	99.1	0.670•	0.562
	%	100	0	98.8	1.2			
Hand washing after working with patients	No.	53	4	156	15	91.7	0.171•	0.461
	%	93	7	91.2	8.8			
Hand washing before performing a septic invasive procedures	No.	31	26	82	89	49.6	0.708	0.246
	%	54.4	45.6	48	52			
Wash my hands after contact with patient surroundings	No.	46	11	90	81	59.6	13.995	<0.001*
	%	80.7	19.3	52.6	47.4			
Drying hands with clean paper towel	No.	39	18	127	44	72.8	0.738	0.244
	%	68.4	31.6	74.3	25.7			
Turn of water after hand washing using paper towel	No.	0	57	7	164	3.1	2.397•	0.129
	%	0.0	100	4.1	95.9			
Overall mean: 52.24% SD: 14.218								

• Fisher's Exact test; * Statically Significant

As shown in Table (4.14), there was inadequate hand washing practice of the study participants working in the HD units; the overall mean score of the study participants hand

washing practice was 52.24% (SD=14.218). This finding is slightly higher than that found in the observational checklist of Eljedi & Dalo (2014) study. Moreover, the researcher found that the percentage of hand washing compliance based on the observational checklist was lower than that reported in the self-administered questionnaires.

Hand washing is considered as one of the most important infection prevention and control procedures, the observed results of hand washing practice revealed poor compliance of the study participants with this important procedure for infection prevention and control.

Regarding the hand wash practice of the study participants working in the HD units, around half (57%) of the study participants (56.1% of Physicians, 57.3% of Nurses) were washing hands for 30-60 seconds using water and soap. This finding showed no statistically significant difference between the study participants in practicing washing hands for 30-60 seconds using water and soap regarding their occupation with (χ^2=0.024, P=0.499).

The study results showed that about one quartile (26.8%) of the study participants (16% of Physicians, 30.4% of Nurses) practiced removing jewelries, watches, and rings during the process of washing their hands, as shown in Table (4.14). There was a statistically significant difference in the practice of removing jewelries, watches, and rings during the process of washing hands among the study participants regarding their occupation with (χ^2=4.663, P=0.021).

The results of the study confirmed that absolute minority (10.5%) of the study participants (5.3% of Physicians, 12.3% of Nurses) working in the HD units wash their hands before contacting with patients. There was no statistically significant difference in the practice of washing their hands before contacting with patients among the study participants regarding their occupation with (χ^2=2.235, P=0.102).

As shown in Table (4.14), the majority (91.7%) of the study participants were washing their hands after taking care of patients. The findings showed no statistically significant difference in the practice of washing hands of the study participants after taking care of patients among participants regarding their occupation with (χ^2=0.171, P=0.461).

The findings of the study revealed that nearly all study participants (99.1%) were washing their hands after any contact with blood, body fluids, secretions, and excretions of

hemodialysis patients. There was no statistically significant difference in the practice of washing hands among the study participants after any contact with blood, body fluids, secretions, and excretions of hemodialysis patients regarding their occupation with (χ^2=0.670, P=0.562).

As shown in Table (4.14), the observational checklist results revealed that around half (49.6%) of the study participants (54.4% of Physicians, 48% of Nurses) were washing their hands before performing invasive procedure for hemodialysis patients. There was no statistically significant difference in the practice of hand washing before performing invasive procedure for hemodialysis patients among the study participants regarding their occupation with (χ^2=0.708, P=0.246).

Around than two-thirds (59.6%) of the study participants (80.7% of Physicians, 52.6% of Nurses) were washing their hands after contacting the surrounding of the hemodialysis patients. This finding showed that there was a statistically significant difference in the practice of hands washing of the study participants after contacting the surrounding of the hemodialysis patients regarding their occupation with (χ^2= 13.995, P=0.000).

As shown in Table (4.14), the study results revealed that more than two thirds (72.8%) of the study participants (70% of Physicians, 75% of Nurses) were drying their hands by using clean paper towel after hand washing procedure. There was no statistically significant difference in the practice of drying hands by using clean paper towel among the study participants regarding their occupation with (χ^2= 0.738, P=0.244). Moreover, the study showed that 3.1% of the study participants (00% of Physicians, 4.1% of Nurses) were used to turn off the water faucet by using paper towel after finishing hand washing procedures. There was no statistically significant difference in the practice of turning off the water faucet by using paper towel after finishing hand washing procedures among the study participants regarding their occupation with (χ^2=2.397, P=0.129). Based on the results of these answers, we can strongly conclude that the health care staff is compliant with hand washing practice as a reaction for protecting themselves rather than protection of the patients.

4.2.1.3   Wearing Gloves:

Table 4.15: Study participants wearing gloves practice compliance according to the observational checklist

Variable		Physicians		Nurse		Mean %	χ^2-value	P-value
		Yes	No	Yes	No			
Wear gloves when contact with blood or other body fluids	No.	55	2	169	2	98.2	1.351•	0.261
	%	96.5	3.5	98.8	1.2			
Wearing sterile gloves when doing invasive procedure	No.	49	8	156	15	89.9	1.306	0.185
	%	86	14	91.2	8.8			
Use clean gloves when handling contaminated instrument	No.	52	5	154	17	90.4	0.067	0.514
	%	91.2	8.8	90.1	9.9			
Overall mean: 92.84% SD: 17.764								

• Fisher's Exact test

As shown in Table (4.15), there was good wearing gloves practice among the study participants working in the HD units; the overall mean score of wearing gloves practice of the study participants was 92.84% (SD=17.764). This finding is nearly double that found in the observational checklist of Eljedi & Dalo (2014) study. Moreover, the researcher found that the percentage of wearing gloves compliance based on the observational checklist was higher than that reported in the self-administered questionnaires. Based on these results, we can conclude that the health care staff is compliant with wearing gloves practice. However, the higher percentage of compliance based on the questionnaire than that of the observational checklist can be attributed to the fact that the health care staff tried to pay more attention to the general problem of scarcity of resources.

The findings of the observational checklist confirmed that, the vast majority (98.2%) of the study participants were wearing gloves while contacting blood or body fluids of the hemodialysis patients (96.5% of Physicians, 98.8% of Nurses). There was no statistically significant difference in the study participants practice of wearing gloves while contacting blood or body fluids of the hemodialysis patients regarding their occupation with (χ^2=1.351, P=0.261).

The results revealed that the majority (89.9%) of the study participants (86% of Physicians, 91.2% of Nurses) were wearing sterile gloves during invasive procedure, as shown in Table (4.15). There was no statistically significant difference in the study participants practice of wearing sterile gloves during invasive procedure regarding their occupation with ($\chi^2=1.306$, $P=0.185$). As shown in Table (4.15), the majority (90.4%) of the study participants (91.2% of Physicians, 90.1% of Nurses) were using clean gloves when handling contaminated instrument. There was no statistically significant difference in the study participant's practice of using clean gloves when handling contaminated instrument regarding their occupation with ($\chi^2=0.067$, $P=0.514$).

4.2.1.4 Antiseptic and Disinfectant:

Table 4.16: Compliance of using antiseptics and disinfectants in the HD units

Variable		Physicians		Nurse		Mean %	χ^2-value	P-value
		Yes	No	Yes	No			
Always cleaning and disinfecting surfaces in the dialysis machine	No.	32	25	98	73	57	0.024	0.499
	%	56.1	43.9	57.3	42.7			
Purge and clean the walls of a week of high efficiency disinfectant	No.	33	24	128	43	70.6	5.925	0.013*
	%	57.9	42.1	74.9	25.1			
Clean and disinfect bed surfaces between patient sessions	No.	13	44	69	102	36	5.713	0.012*
	%	22.8	77.2	40.4	59.6			
Sterilize the dialysis machine from the inside with disinfectant	No.	48	9	171	0	96.1	27.986•	<0.001*
	%	84.2	15.8	100	0			
Clearing all the tools used for the patient before used for the next patient	No.	42	15	131	40	75.9	0.200	0.389
	%	73.7	26.3	76.6	23.4			
Overall mean: 67.11% SD: 23.828								

•Fisher's Exact test; * Statically Significant

As shown in Table (4.16), there was inadequate disinfectant and antiseptic usage by the health care providers working in the HD units; the overall mean score of using antiseptics and disinfectants by the study participants was 67.11% (SD=23.828). This finding is much higher than that found in the observational checklist of Eljedi & Dalo (2014) study.

Moreover, the researcher found that the percentage of disinfectant and antiseptic usage compliance based on the observational checklist was lower than that reported in the self-administered questionnaires. This low level of compliance can be attributed to the fact that the entity responsible for cleaning of the HD unit is the cleaning company. These cleaning companies are not qualified enough to implement good disinfection practice.

Regarding the practice of using disinfectants and antiseptics by the study participants working in HD units, as shown in Table (4.16), the results revealed that nearly half (57%) of the study participants (56.1% of Physicians, 57.3% of Nurses) confirmed that hemodialysis machines surfaces were cleaned and disinfected. There was no statistically significant difference among the study participants confirming of the use of disinfectants and antiseptics in cleaning and disinfecting surfaces of hemodialysis machines regarding their occupation with (χ^2=0.024, P=0.499). However, nearly two-thirds (70.6%) of the study participants (58% of Physicians, 74.9% of Nurses) confirmed that cleaning process of the walls is done by using weak disinfectant. There was a statistically significant difference among the study participants confirmation of the use of weak disinfectants in cleaning of the walls of the HD units regarding their occupation with (χ^2=5.925, P=0.013).

Around one third (36%) of the study participants (22.8% of Physicians, 40.4% of Nurses) confirmed that the hemodialysis machine beds are cleaned and disinfected between patient sessions. There was a statistically significant difference among the study participants confirmation that the hemodialysis machine beds are cleaned and disinfected between patient sessions regarding their occupation with (χ^2=5.713, P=0.012).

The result revealed that the majority (96.1%) of the study participants (80% of Physicians, 100% of Nurses) confirmed that the inside of the hemodialysis machine were sterilized by using disinfectants, as shown in Table (4.16). There was a strong statistically significant difference among the study participant's confirmation that the inside of the hemodialysis machine were sterilized by using disinfectants regarding their occupation with (χ^2=27.986, P=0.000).

As shown in Table (4.16), more than two thirds (75.9%) of the study participants (74% of Physicians, 76.6% of Nurses) were clearing all the tools used for the hemodialysis patient before using it for the next patient. There was no statistically significant difference among

the study participants practice of clearing the tools used for the hemodialysis patient before using it for the next patient regarding their occupation with (χ^2=0.200, P=0.389).

4.2.1.5 Sharp Waste Disposal:

Table 4.17: Sharp waste disposal practice of the study participants

Variable		Physicians		Nurse		Mean %	χ^2-value	P-value
		Yes	No	Yes	No			
Do not Recapping used needles before disposal	No.	16	41	109	62	54.8	21.965	<0.001*
	%	28.1	71.9	63.7	36.3			
Do not Remove used needles from syringes before disposal	No.	36	21	161	10	86.4	34.957	<0.001*
	%	63.2	36.8	94.2	5.8			
Disposal of sharps in Safety box	No.	54	3	170	1	98.2	5.405•	0.049*
	%	94.7	5.3	99.4	0.6			
Labeling and separating waste disposals	No.	36	21	105	66	61.8	0.056	0.471
	%	63.2	36.8	61.4	38.6			
Overall mean: 75.33% SD: 21.44								

• Fisher's Exact test; * Statically Significant

As shown in Table (4.17), the study participants working at the HD units were at high risk of injury due to incorrect sharp materials disposal practice ; the overall mean of safe sharp materials disposal practice score practiced by the study participants was 75.33% (SD=21.44).

The study findings is consistent with that of Eljedi & Dalo (2014) local study in considering there is a big problem in labeling and separating wastes as there is no policy in all hospitals to separate or label waste products and there is an obvious problem in on recapping used needle before disposal. The study findings also is consistent with the findings of Phukan, (2014).

Regarding the study participants practice of sharp materials disposal at the HD units, as shown in Table (4.17), around half (54.8%) of the study participants (28.1% of Physicians,

63.7% of Nurses) were not recapping used needles before disposal. There was a statistically significant difference among the study participants safe disposal practice of used needles regarding their occupation with (χ^2=21.965, *P*=0.000).

The results of the study revealed that 86.4% of the study participants (63.2% of Physicians, 94.2% of Nurses) were not removing used needles from syringes before disposing it. The findings showed that there was statistically significant difference among the study participants safe disposal practice of removing used needles from syringes before disposing it regarding their occupation with (χ^2=34.957, *P*=0.000). As shown in Table (4.17), the majority (98.2%) of the study participants (94.7% of Physicians, 99.4% of Nurses) were disposing sharp materials in Safety boxes. There was a statistically significant difference among the study participants safe disposal practice of sharp materials in Safety boxes regarding their occupation with (χ^2=5.405, *P*=0.049). However, Table (4.17) revealed that nearly two thirds (61.8%) of the study participants (63.2% of Physicians, 61.4% of Nurses) were labeling and separating sharp waste when disposing it. There was no statistically significant difference among the study participants safe disposal practice of labeling and separating sharp waste before disposal regarding their occupation with (χ^2= 0.056, *P*=0.471). This finding was much better than that observed by Tabash study (2016), while it is still lower than that observed by Qeshta study (2016). From the researcher perspective, this can be attributed to the fact that HD unit's generated waste are much more than that generated by dental clinics. Additionally, HD units had higher workload than that observed at dental clinics.

4.2.1.6 Isolating Patients with Known Blood Borne Infection:
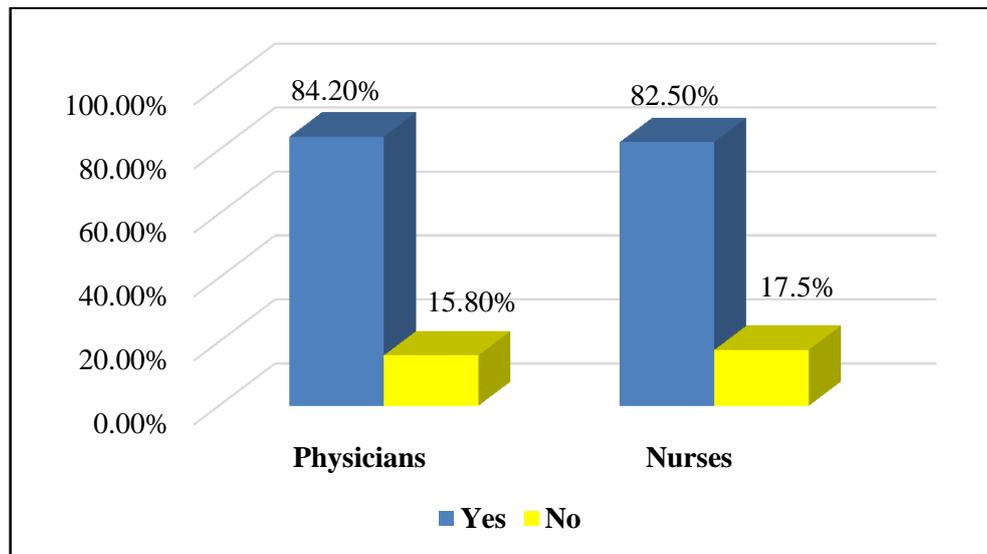
Figure 4.9: Distribution of study participant and isolation of patients with known blood borne infection

Observation checklist results about using sterile equipment by the study participants were shown in Fig. (4.9), the results showed that the majority (82.9%) of the study participants (84.2% of Physicians, 82.5% of Nurses) were using a separate dialysis machine for patients with known blood borne infection. There was no statistically significant difference among the study participants practice of using separate dialysis machine for patients with known blood borne infection regarding their occupation with (χ^2= 0.093, P=0.469) (Annex15).

As shown in Annex16, nearly all (98.2%) of the study participants (100% of Physicians, 97.7% of Nurses) were using a sterile set of equipment for each patient. This finding showed that there was no statistically significant difference among the study participants practice of using a sterile set of equipment for each patient regarding their occupation with (χ^2= 1.351, P=0.314). This finding is consistent with that of Eljedi & Dalo (2014) study. The finding is also consistent with that reported in the self-administered questionnaires.

4.2.1.7 Protect Hemodialysis Patients from Visitors:
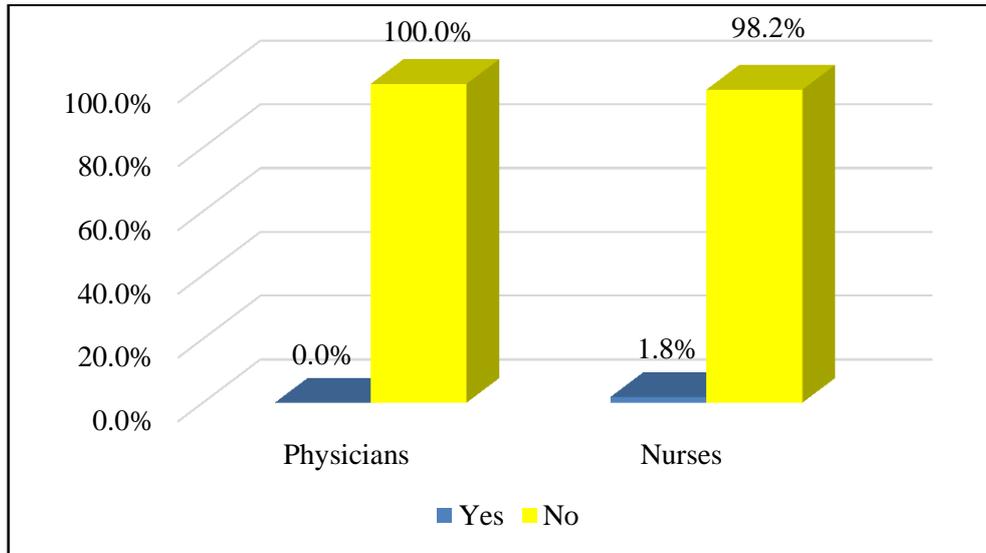
Figure 4.10: Distribution of study participants regarding protection of patients from visitors

Regarding the visitors protective measures implemented by the study participants, as shown in Fig. (4.10), only 1.3% of the study participants (0.0% of Physicians, 1.8% of Nurses) said that the visitors are provided with protective measures before entering the HD unit. This findings showed that there was no statistically significant difference among the study participants practice of providing visitors with protective measures before entering the HD unit regarding their occupation with (χ^2= 1.009, *P*=0.420) (Annex17). This finding is consistent with that reported in the self-administered questionnaires. This finding is much lower than that found in Eljedi & Dalo (2014) study. The researcher believes that the lack of compliance of health care staff with IPC protocol is most likely due to several reasons, the most important are: the lack of interest and support for this issue from the hospital management; the failure of the IPC Committee in promoting health care staff compliance with the protocol; the absence of indicators for measuring health care staff compliance with the IPC protocol; the absence of the General Directorate of Monitoring and Evaluation role in follow-up and documentation of this phenomenon.

4.2.2 Inferential Statistics of the Observational Checklist:

Table 4.18: Inferential statistics related to hospitals in the observational checklist reported practice

Variable	Hospital	Mean	Std. Deviation	F value	Sig.
Observational Practice	Al Shifa	67.25	6.205	12.184	<0.001*
	Nasser	56.72	14.123		
	Al Aqsa	63.88	13.472		
	Al Najjar	69.09	1.809		
	Al Rantisi	70.22	10.832		
Hands Washing Score	Al Shifa	52.2	12.291	13.932	<0.001*
	Nasser	41.88	8.63		
	Al Aqsa	49.16	17.575		
	Al Najjar	58.59	5.025		
	Al Rantisi	63.37	18.442		
Wearing Gloves Practice Score	Al Shifa	94.79	13.093	11.952	<0.001*
	Nasser	92.31	23.522		
	Al Aqsa	75.76	25.376		
	Al Najjar	100	0		
	Al Rantisi	98.77	6.415		
Using Disinfectants Practice Score	Al Shifa	59.17	20.502	6.715	<0.001*
	Nasser	69.23	39.429		
	Al Aqsa	75.15	10.038		
	Al Najjar	80	0		
	Al Rantisi	66.67	22.188		
Wasting Sharp Disposal Practice Score	Al Shifa	86.46	16.188	17.545	<0.001*
	Nasser	63.46	21.342		
	Al Aqsa	60.61	32.494		
	Al Najjar	75	0		
	Al Rantisi	71.3	11.401		

* Statically Significant

Table 4.19: Inferential statistics related to occupation in the observational checklist reported practice

Variable	Occupation	Mean		Std. Deviation	t	Sig.
Observational Practice	Physician	60.35	65.58	14.972	3.371	0.001*
	Nurse	67.32		7.664		
Hands Washing Score	Physician	52.63	52.24	11.976	0.239	0.812
	Nurse	52.11		14.921		
Wearing Gloves Practice Score	Physician	91.23	92.84	24.009	0.633	0.528
	Nurse	93.37		15.176		
Using Disinfectants Practice Score	Physician	58.95	67.11	30.804	2.49	0.015*
	Nurse	69.82		20.392		
Wasting Sharp Disposal Practice Score	Physician	62.28	75.33	29.171	4.292	0.000*
	Nurse	79.68		16.044		

* Statically Significant

Regarding the hand washing practice of the health care providers working in the HD units (before and after contacting patients) which was obtained from the observational checklist, as shown in Table (4.18), the study found that there is an inadequate hand washing practice among the health care providers, the overall mean score of hand washing practice among the health care providers working at the HD units was 52.24%. The highest hand washing practice score was reported at Al Rantisi hospital with a mean score of 63.37%, while the lowest hand washing practice score was reported at Nasser hospital with a mean score of 41.88%. Moreover, it was observed that the hand washing practice score of physicians working in the HD unit was approximately equals that of Nurses (Physicians mean score was 52.63%, Nurses mean score was 52.11%), as shown in Table (4.19). One way Anova test was conducted to examine the presence of statistically significant differences among the study participants at different settings concerning the hand washing practice score. As shown in Table (4.18), there was a strong statistically significant difference in the hand washing practice score of the study participants among the study settings with (F=13.932, P value= <0.001). Post Hoc - Bonfirroni test has revealed that the significant difference was between Al Shifa medical complex and Nasser hospitals (Sig.=0.000) clearly indicating that the hand washing practice at Al Shifa medical complex tend to be better than that observed at Nasser hospitals. Another significant difference was observed between Al Aqsa hospital and both Al Najjar

(Sig.=0.032) and Al Rantisi hospital (Sig.= <0.001), it seems that the hand washing practice at Al Aqsa hospital is less than that observed at the others two hospitals. Moreover, a significant difference was observed between Al Rantisi hospital and Nasser hospital (Sig.= <0.001), indicating that the hand washing practice at Al Rantisi hospital is better than that observed at Nasser hospital. Additionally, a significant difference was observed between Al Rantisi hospital and Al Shifa medical complex (Sig.=0.001), indicating that the hand washing practice at Al Rantisi hospital is better than that observed at Al Shifa medical complex. Finally, a significant difference was observed between Al Najjar hospital and Nasser hospital (Sig.= <0.001), indicating that the hand washing practice at Al Najjar hospital is better than that observed at Nasser hospital. Moreover, there was no statistically significant differences in hand washing practice score among health care providers regarding their occupation (t Test=0.239, P value=0.812), as shown in Table (4.19).

Regarding the wearing gloves practice of the health care providers working in the HD units, which was obtained from the observational checklist, as shown in Table (4.18), the study found that there is a high level of compliance with wearing gloves practice among the health care providers, the overall mean score of wearing gloves practice of the study participants among the HD units was 92.84%. The highest wearing gloves practice score was reported at Al Najjar hospital with a mean score of 100%, while the lowest wearing gloves practice score was reported at Al Aqsa hospital with a mean score of 75.76%. Moreover, it was observed that the wearing gloves practice score of physicians working in the HD unit was lower that of nurses (Physicians mean score was 91.23%, Nurses mean score was 93.37%), as shown in Table (4.19). One way Anova test was conducted to examine the presence of statistically significant differences among the study settings concerning the wearing gloves practice score. As shown in Table (4.18), there was a strong statistically significant difference in the wearing gloves practice score of the study participants among the study settings with (F=11.952, P value=<0.001). Post Hoc - Bonfirroni test has revealed that the significant difference was observed between Al Aqsa hospital and the other four hospitals: Al Najjar hospital (Sig.= <0.001), Al Rantisi hospital (Sig.=0.000), Nasser hospital (Sig.=0.000), Al Shifa medical complex (Sig.= <0.001), it seems that the wearing gloves practice at Al Aqsa hospital is less than that observed at the others four hospitals. Moreover, there was no statistically significant differences in the

wearing gloves practice score among health care providers regarding their occupation (t Test=0.633, P value=0.528), as shown in Table (4.19).

Regarding the using disinfectant practice of the health care providers working in the HD units which was obtained from the observational checklist, as shown in Table (4.18), the study found that there is a low level compliance with using disinfectant practice among the health care providers working in the HD units, the overall mean score of using disinfectant practice among the HD units was 67.11%. The highest using disinfectant practice score was reported at Al Najjar hospital with a mean score of 80.0%, while the lowest using disinfectant practice score was reported at Al Shifa medical complex with a mean score of 59.17%. Moreover, it was observed that the using disinfectant practice score of physicians working in the HD unit was lower that of nurses (Physicians mean score was 58.95%, Nurses mean score was 69.82%), as shown in Table (4.19). One way Anova test was conducted to examine the presence of statistically significant differences of the study participants among the study settings concerning the using disinfectant practice score. As shown in Table (4.18), there was a strong statistically significant difference in the using disinfectant practice score of the study participants among the study settings with (F=6.715, P value= <0.001). Post Hoc - Bonfirroni test has revealed that the significant difference was observed between Al Shifa medical complex and both Al Aqsa hospital (Sig.=0.006) and Al Najjar hospital (Sig.= <0.001), it seems that the using disinfectant practice at Al Shifa medical complex is less than the other two mentioned hospitals. Moreover, there was a statistically significant differences in the using disinfectant practice score among health care providers regarding their occupation (tTest=2.49, P value=0.015), as shown in Table (4.19).

Regarding the sharp waste disposal practice of the health care providers working in the HD units, which was obtained from the observational checklist, as shown in Table (4.18), the study found that there is inadequate sharp waste disposal practice among the health care providers working in the HD units; the overall mean score of sharp waste disposal practice among the HD units was 75.33%. The highest sharp waste disposal practice score was reported at Al Shifa medical complex with a mean score of 86.46%, while the lowest sharp waste disposal practice score was reported at Al Aqsa hospital with a mean score of 60.61%. Moreover, it was observed that the sharp waste disposal practice score of physicians working in the HD units was lower that of nurses (Physicians mean score was 62.28%, Nurses mean score was 79.68%), as shown in Table (4.19). One way Anova test

was conducted to examine the presence of statistically significant differences among the study settings concerning the sharp waste disposal practice score. As shown in Table (4.18), there was a strong statistically significant difference in the sharp waste disposal practice score of the study participants among the study settings with (F=17.545, Pvalue= <0.001). Post Hoc - Bonfirroni test has revealed that the significant difference was observed between Al Shifa and other three hospitals: Al Aqsa hospital (Sig.= <0.001), Nasser hospital (Sig.= <0.001), Al Rantisi hospital (Sig.=0.003), indicating that the sharp waste disposal practice at Al Shifa medical complex is better than the observed at other three hospitals. Moreover, there was a statistically significant differences in the sharp waste disposal practice score among health care providers regarding their occupation (t Test=4.292, P value=<0.001), as shown in Table (4.19).

Regarding the overall observational practice score of the health care providers working in the HD units which was obtained from the observational checklist, as shown in Table (4.18), the study found that there is low overall observational practice score among the study participants working in the HD units, the overall mean score of practice among the HD units was 65.58%. The highest overall observational practice score was reported at Al Rantisi hospital with a mean score of 70.22%, while the lowest overall observational practice score was reported at Nasser hospital with a mean score of 56.72%. Moreover, it was observed that the overall observational practice score of physicians working in the HD unit was lower that of nurses (Physicians mean score was 60.35%, Nurses mean score was 67.32%), as shown in Table (4.19). One way Anova test was conducted to examine the presence of statistically significant differences among the study settings concerning the overall observational practice score. As shown in Table (4.18), there was a strong statistically significant difference in the overall observational practice score of the study participants among the study settings with (F=12.184, P value=<0.001). Post Hoc - Bonfirroni test has revealed that the significant difference was observed between Nasser and the other four hospitals: Al Aqsa hospital (Sig.=0.017), Al Shifa medical complex (Sig.= <0.001), Al Rantisi hospital (Sig.= <0.001) and Al Najjar hospital (Sig.= <0.001), indicating that the overall observational practice at Nasser hospital is less than the observed in the other four hospitals. Moreover, there was a statistically significant differences in the overall observational practice score among the study participants regarding their occupation (t Test=3.371, P value=0.001), as shown in Table (4.19).

4.3 Physical Environment Observational Checklist Results

Table 4.20: Assessment of HD units' infrastructure fitness

Variable	Yes	No
There is adequate distance between HD beds	20%	80%
Customize place to deal with contaminated instruments reusable.	20%	80%
There is Isolation room for patient with blood borne disease	60%	40%
The allocation of nursing staff to treat isolated patients during hemodialysis	60%	40%
Provide adequate space for the storage of clean and sterile materials away from the patient's service area.	40%	60%
Allocation separated area to store contaminated material.	60%	40%
Allocation area appropriately sized for water treatment unit.	100%	0%

Hemodialysis units infrastructure fitness and their conformance to international standards, showed in Table (4.20). There was no appropriate distance in between hemodialysis beds in 80% of hospitals, which is a major obstacle hindering the implementation of the IPC protocol in the HD units. This result is contrary with the international standards of the HD units' areas (Hemodialysis quality and standards, 2012). From the researcher`s perspective, this finding is due to the fact that there was a consecutive increase in the number of hemodialysis patients in last few years, as a result of that, there was an increased number of HD machine installed in these units to meet this need, regardless the available space and design of these units. Also, the results revealed that there was no allotment of certain room as an isolation room for patients with blood borne disease in 40% of hospitals as in Nasser medical complex and Al Najjar hospital. Nearly half of hospitals didn't have nursing staff assign specifically to deal with the isolated patients inside these HD units. Moreover, there was no allotment of certain place or room to clean and disinfect reusable contaminated instruments before sending it to the sterilization section in 80% of hospitals. Three hospitals have no adequate space for the storage of clean and sterile materials inside the HD units. Also, two hospitals didn't have specific place to store contaminated material. Finally, all HD units in the study settings have appropriate area for water treatment units. From the researcher perspective, the finding related to the presence of isolation room for

patients with blood borne diseases in the HD units is a serious point, meanwhile, it can be attributed to the fact that Al Najjar hospital has no isolation room, and all patients with blood borne disease resident in Rafah governorate are referred to Nasser medical complex. Moreover, at Nasser medical complex, only patients with HBV are physically separated from other patients (separate machine in a separate room), while patients with HCV are using separate machine but not separated physically from other patients in another room.

Table 4.21: Availability of IPC protocol resources in the HD units

Variable	Yes	No
Availability of Rubbing Alcohol lotion in the unit.	40 %	60%
Availability of hand washing supplies in the unit	60 %	40%
Availability of sufficient disposables and linen in the unit	40 %	60%
Availability of sharp disposal containers in each room.	100 %	0%
Availability of non-sterile gloves in the unit.	80 %	20%
Availability of sterile gloves in the unit.	80 %	20%
Covering beds by clean linen in the unit.	40 %	60%
Providing necessary tools and materials in isolation room	80 %	20%

Availability of needed resources for IPC practice in the HD units obtained from the observational checklist results was showed in Table (4.21). Alcohol hand rub was available only in two hospitals in a continuous manner and the supplies required for hand wash was available in three hospitals. Moreover, the checklist results revealed that the safety boxes were available in all HD units as stipulated by the IPC protocol. The sterile and non-sterile gloves were available in 80% of HD units in abundance hospital. The researcher noticed that there is a shortage in the availability of clean linens necessary to cover hemodialysis beds. Also the results showed clearly that there was numbers of hemodialysis beds was not covered with clean linens in three hospitals in the study. Finally, the researcher noticed that there was sufficient amount of tools, materials, and equipment necessary for the isolation area of the HD units in 80% of hospitals. These findings are consistent with that of Eljedi & Dalo (2014) study except that in the availability of linen and alcohol rubbing. Whereas, Eljedi & Dalo (2014) study showed higher percentage of availability of both linen and

alcohol rubbing resources. Based on these results we can strongly conclude that the linen and alcohol rubbing availability is an issue for the HD units in the Palestinian hospitals. This problem might be due to two reasons: current resources of both linen and alcohol rubbing are not sufficient to meet the needs; the health care staff and the hospital management does not perform its assigned role in controlling the loss of linens.

Table 4.22: HD unit cleanness level

Variable	Yes	No
Patient units are clean	100%	0%
Doctor's room is clean	80%	20%
Nursing room is clean	100%	0%
General cleanness in HD unit (kitchen, bathroom, toilette)	60%	40%
Accumulation of medical waste inside the hemodialysis unit.	0%	100%

HD unit cleanness level observational checklist results is shown in Table (4.22), the results confirmed that there was high level of compliance in maintaining nursing room and patient units cleanness in all hospitals. Furthermore, the researcher noticed that 80% of physician's rooms were clean in four hospitals. Additionally, there was no accumulation of medical wastes inside the HD units in all study hospitals during the assessment period. The results revealed that there was an acceptable cleanness level in HD unit accessories at 60% of hospitals. These findings are consistent with that of Eljedi & Dalo (2014) study. From the researcher perspective, there is a cleanness issue facing the HD units in the Palestinian hospitals. This problem might be resulted from several reasons: cleaning companies are not performing its assigned role correctly; the number of bathrooms in the HD units is not enough, there is no bathrooms dedicated for patients, health care staff, and visitors.
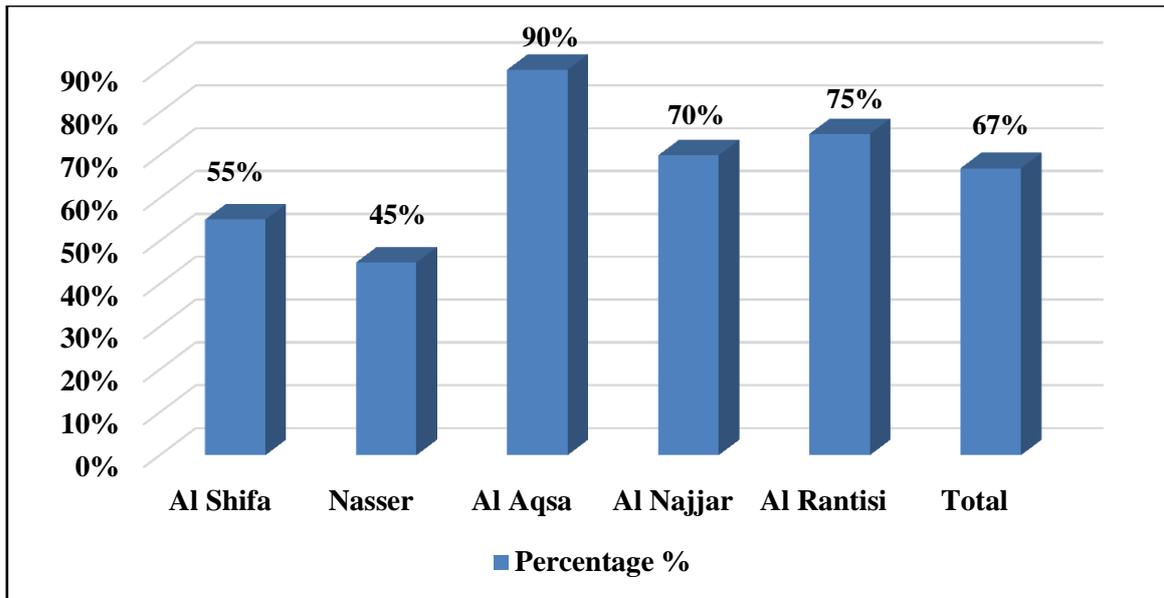
Figure 4.11: Physical Environment Fitness Score at Hospitals

As shown in Fig. (4.11), the observational checklist assessment results showed there was a variation in the overall score level among the study setting, the overall mean score of physical environment fitness score was 67%. The highest score level was reported at Al Aqsa hospital with a mean score of 90%, while the lowest score level was reported at Nasser hospital with a mean score of 45%.

4.4 Focus Groups Findings

The researcher conducted one focus group meeting; it was conducted at the General Directorate of Hospitals. Participants in the meeting included six health care providers with a managerial position related to the work in the hemodialysis units. The participants was included; A chief physician from the General directorate of hospitals; A chief nurse from the General directorate of hospitals; The supervisor nurse of Al Shifa medical complex HD unit; Al Shifa medical complex infection control committee nurse; The MoH central infection control committee chief physician and chief nurse. Notes were taken during the meeting and recorded by an audio recorder. The meeting time lasted for 75 minutes; the discussions were directed by the researcher. Large amount of important and valuable data gathered throughout the meeting required a long procedure of data processing, categorization, and reduction done by the researcher himself.

This process allowed the researcher to interpret non-cleared findings and many deep questions and discussions were conducted during the meeting of the focus group.

The meeting included the following:

1. Importance of using IPC protocols in hemodialysis units at governmental hospitals.

All of participants in the meeting agreed that the IPC protocol is a cornerstone for best practice in hemodialysis units for the following reasons:

a. IPC protocol protects health care providers from the exposure to blood borne disease and improper handling of contaminated medical disposable could be life threatening.

b. Patients in hemodialysis units are immune compromised and their health is at stake.

c. Prevention of diseases is less expensive than the cost of treatment, which could be unavailable.

d. There is a large amount of medical disposables usage at the hemodialysis units, which increases the probability of injury of the health care providers, hemodialysis patients, and visitors.

2. Presence of Palestinian IPC protocols.

Only two thirds (67%) of the focus group participants know about the presence of Palestinian IPC protocols, the first IPC protocol was issued through Maram project (2004). This protocol focused mainly on the reproductive health and did not address infection prevention and control in the services provided in the hospitals at all.

In 2012, the general directorate of hospital adopted the Jordanian IPC protocol. Only one single copy of the Jordanian IPC protocol was sent to each hospital attached in a formal circulation letter. Moreover, the Jordanian IPC protocol circulation was neither followed by a training process for the health care providers, nor followed by an update for its content, which recommended by the Jordanian author himself.

3. Content of the Jordanian IPC protocols.

One half (50%) of the participants in the meeting did not know anything about the content of the Jordanian IPC protocol. Moreover, the Jordanian IPC protocol contains a particular part for health care providers working in the hemodialysis units.

4. National IPC protocol.

The participants in the meeting agreed that there is urgent need to establish a national IPC protocol and the provision the following procedures:

   a. A national funded project.

   b. Full support from all management levels at health care system.

   c. A concerted efforts of all parties

   d. A clear hierarchical structure that identifies the entity responsible for follow up of the IPC establishment process, implementation, monitoring & evaluation, and feedback with a full delegation of authorities.

5. Training program on the content of the Jordanian IPC protocol and monitoring system for implementation.

The participants agreed that all the previous training programs conducted in the hospitals were focusing on general basics of infection prevention and control and did not contain any specified procedures related to the work at the hemodialysis units and its particularity. Moreover, the training course coverage of nurses at Al Shifa medical complex was 40-50%, while the physicians didn't had any training. Additionally, the training course was conducted using a lecture without onsite training and practical procedures. However, they confirmed clearly, that training was contained the basics of IPC needed in all hospital wards and was targeting workers in the intensive care units not the health care providers working in the hemodialysis units.

The meeting results showed that all participants agreed on inadequate practice level of health care providers whom working in the hemodialysis units and they only have the basics of IPC practice. In addition, there is no any evaluating process or measuring indicators for the health care providers practice in the HD units. As a result of that, it is not

possible to assess health care provider's compliance with hemodialysis unit's specific IPC protocols.

6. Vaccination program and policies to protect health care provider working in the hemodialysis units.

The results showed a conflict between the central committee for infection control and the department of preventive medicine in the definition of HB virus vaccination steps necessary for protecting the health care provider working in the hemodialysis units. The department of preventive medicine considers all health care providers whom received three doses of HB virus vaccine are protected against the HB virus regardless examining their Anti body titter. While the central committee for infection control considered the examination of the Anti-bodies titter is a must to ensure that health care providers has an immunity for HB virus.

The participant reported that at recent periods, MoH will doing screening test for the health care provider working in the hemodialysis units in order to know the proportion of vaccinated staff and the number of doses required for their coverage and examine the response to them. Recently MoH did a survey in Al Shifa medical complex and results found that the percentage of nurse who received 3 doses was only 67%.

The participants in the meeting confirmed absence of formal circulate letter within the MoH obligates health care providers working in the hemodialysis units to receive the vaccination.

7. The procedures that the health care providers follow after exposure to injury from sharp contaminated materials.

The participants confirmed that the health care provider after any exposure to injury from used sharp materials, came to the central committee of infection control to fill a special form documenting the incident details. The central committee of infection control sends a formal letter to the hospital management including the recommendations and medical management required to treat the injured health care provider including admitted to hospital if needed. Unfortunately, the participants confirmed that there is a high incidence of injury of health care provider working in the hemodialysis units from used sharp disposables as shown in the self-administered questionnaires findings.

8. **Monitoring system for the infection prevention and control practice inside the hospitals.**

The participants were unanimous that the central committee for infection control is responsible for monitoring infection prevention and control procedures inside hospitals.

9. **Barriers for good compliance with IPC Protocol.**

The participants were unanimous that there are a lot of barriers for good compliance with IPC Protocol in the HD units including the following:

a. Lack of awareness among workers about IPC protocol.

b. A lack of training , follow-up, and supervision

c. Unavailability of some materials needed for the safe disposal of used disposables.

d. Lack of visitor's commitment to follow the IPC protocol instructions.

e. Lack of a sufficient number of workers.

f. Absence of policy and procedures for the IPC in the hemodialysis units.

g. Absence of management support for implementation of the IPC protocol.

h. Existence of a defect in the organizational structure of the infection control staff in the MoH.

10. **Recommendations for improving the compliance with IPC Protocol in the HD units.**

The participants in the meeting were unanimous that there are a lot of recommendations necessary for improving the compliance of the health care providers with the IPC Protocol in the HD units including the following:

a. Adoption of clear written protocol including policies and procedures for the IPC in the HD units.

b. Proper dissemination of hard and soft copies of this protocol.

c. Strengthening the role of the central committee for infection and prevention control.

d. Provide capabilities needed for good infection control practice.

e. Implementation of a comprehensive training program targeting all workers in the hemodialysis units including physicians, nurses, and cleaners.

f. Development of indicators to measure the extent of compliance with the IPC protocol.

g. Renewal of the building in accordance with infection control requirements.

h. Improve the field documentation of injury incidents at work, and provide protection for all HCP.

i. Include the training on infection control within the program of practicing the profession.

j. Modified the organizational structure for the staff assigned to follow up the infection control procedures in hospitals to suit their actual work.

From the researcher's point of view, the findings of the focus group confirmed that of the majority of quantitative part. The study participants of the focus agreed on the necessity and importance of the IPC protocol at the HD units. Additionally, the current IPC protocol need for urgent updating. Moreover, training and dissemination process of the IPC protocol was not done properly and need to be improved. Finally, there is a great necessity to establish our own national IPC protocol, but still there are many obstacles facing this step. The study revealed the presence of obvious problem in the identification of the health care staff immunization measurements between the Department of Preventive Medicine and the Central IPC committee in the MoH. Based on the CDC recommendations, the researcher sees that it is important to test the antibodies titter for health care staff after three doses of HB vaccination to assure the complete protection. Additionally, the study revealed the presence of conflict in the identification of roles and responsibilities of different entities responsible for maintaining Good IPC practice in the MoH. This conflict need to be solved through clarification of the roles and responsibilities of all parties.

Chapter 5: Conclusion and Recommendations

5.1 Conclusion

This is the first study conducted in GG that assesses the HCP's compliance to IPC protocol at HD units. The findings of the study showed positive HCPs attitude toward IPC protocol among the HCPs working in the HD units while knowledge and practice of HCPs about the IPC protocol at the HD units were inadequate.

The compliance of HCPs with the IPC protocol was quantitatively evaluated using two tools: the first was the self-administered questionnaire, while the second was the observational checklist. Focus group discussion was used to deeply understand and interpret unclear findings. Through the self-administered questionnaire findings, the study revealed inadequate IPC training and education programs among the HCPs. There was a good level of wearing gloves practice compliance, while there was insufficient hand washing practice among the HCPs working in the HD units. Around half of the study participants were found exposed to injuries from used needle or sharp instruments. Additionally, the study showed that HCPs are at high risk due to improper sharp disposal practice; moreover, there was inadequate vaccination of the HCPs working in the HD units. The study revealed that nurse staff were committed to wear the formal uniform more than that of physicians, nevertheless, both are not fully comply with wearing the white formal uniform. There was an inadequate disinfectants and antiseptics practice in the HD units. Only half of the study participants confirmed that HD patients were examined for HB and HIV before dialysis. Additionally, the study confirmed that not all HD patients were given three doses of HBV vaccine for non-infected patients, only 1.3% of the study participants revealed that the visitors are provided with protective measures before entering the HD units. Moreover, the majority of the study participants recognized insufficient time, lack of required supplies, lack of knowledge and education, lack of job satisfaction, inadequate training program and lack of updated information, lack of guidelines from colleagues and superior, absence of accountability and feedback from administration, and high workload as the main barriers for good compliance with IPC protocol in the HD units.

Additionally, the findings of the observational checklist were consistent with that reported in the self-administered questionnaire in the Knowledge score, wearing uniform, training score, hand washing practice score, waste disposal practice score, vaccination score,

disinfectant usage score, while wearing gloves practice was more better than the perceived level in the self-administered questionnaire.

Physical environment observational checklist was used to assess the HD units physical environmental fitness needed to satisfy and perform the standard IPC protocol, the assessment revealed the presence of physical environmental obstacles that hinders the implementation of standard IPC protocol, the study found wide variation in the level of physical environmental fitness among different HD units.

The participants in the focus group confirmed that the IPC protocol is a cornerstone for best practice in the HD unit and the absence of national IPC protocol is considered as the main issue. The focus group finding revealed weak performance of the infection control committee, and so the training and education sessions. The participants also confirmed the absence of hospital surveillance program, and scarcity of tools and equipment used in infection prevention practices.

5.2 Recommendations

1. MoH needs to adopt national IPC protocol especially for the HD unit.
2. MoH needs to adopt unified immunization program for HCPs working at the HD unit.
3. MoH needs to implement a continuous education and training programs for healthcare staff concerning the HD units IPC protocol.
4. MoH needs to disseminate printed and softcopies copies of the HD units IPC protocol.
5. MoH has to activate the role of auditing system to improve HCPs compliance with the HD units IPC protocol.
6. There is a need to incorporate items related to the HCPs compliance with the HD units IPC protocol in the annual performance appraisal.
7. MoH needs to identify the roles and responsibilities of different entities responsible for maintaining good IPC practice and have to solve hierarchical conflict.
8. MoH needs to improve the role of Monitoring and Evaluation directorate to improve compliance with the HD units IPC protocol.
9. MoH need to provide capabilities necessary for good IPC practice.
10. MoH need to renew the buildings of the HD units in accordance with IPC requirements.

5.3 Recommendations for Further research

1. Further research studies should be conducted to assess the compliance of HCPs working in other departments with IPC protocols in all governmental, NGOs, and private hospitals.

2. Assessment of the cleaning companies performance at different hospital departments in accordance with IPC protocol.

3. Conduct comparative studies to compare the level of compliance with IPC protocol in the GG governmental hospitals with that in the West Bank governmental hospitals.

4. Conduct comparative studies to compare the level of compliance with IPC protocol in the NGOs and private hospitals with that in the governmental hospitals.

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Annexes

Annex (1): Palestine State Map

Annex (2): Gaza Governorates Map

Annex (3): The Governmental Hospitals in GG that Provides HD Services

N0.	Hospital name	Location	Hemodialysis machine	Bed capacity
1	Al Shifa Medical complex	Middle of Gaza city	32	619
2	Nasser Medical complex	Middle of Khan Younis city	17	322
3	Al Aqsa Martyrs Hospital	Middle of Deir Albalah city	12	129
4	Mohammed Al Najjar Hospital	Middle of Rafah city	12	80
5	Abdelaziz Al Rantisi Hospital	West of Gaza city	8	55

Table number 2: the governmental hospitals in GG (Source: MoH, 2013)

Annex (4): The Study Settings

Al Shifa Medical Complex

Al Shifa medical complex was established in the year 1946 on an area of 42 thousand meter squares. It is located in the western side of Gaza City. Al Shifa Medical complex consists of four hospitals with different medical specialties including medical, surgical, and Obstetric and genecology services with a total beds capacity of 619 beds. In 2013, the total number of admitted cases was 62046 cases; bed occupancy rate was 107%, bed residency rate was 2.9 days (MoH, 2013). Moreover, the hospital provides hemodialysis service for 311 adult ESRD patients resident in Gaza city and north area, the total number of HD machines is 32, the total number of HD sessions provided in 2014 was 36,731 session (MoH, 2015).

Al Aqsa Hospital

Al Aqsa Hospital was established in 2001 on an area of 4 thousand meter squares. It is located in the middle side of Deir El balah City. Al Aqsa hospital provides different medical specialties including medical, surgical and Obstetric and genecology services with a total beds capacity of 129 beds. In 2013, the total number of admitted cases was 15053 cases; bed occupancy rate was 79%, bed residency rate was 4.7days (MoH, 2013). Moreover, the hospital provides hemodialysis service for 65 adult ESRD patients resident in Gaza city and north area, the total number of HD machines is 12, the total number of HD sessions provided in 2014 was 9180 session (MoH, 2015).

Nasser Medical Complex

Nasser medical complex was established in 1960 on an area of 18.4 thousand meter squares; it is located in the western side of Khan Yonis City. Nasser Medical complex consists of three hospitals with different medical specialties including medical, surgical, and Obstetric and genecology services with a total beds capacity of 322 beds. In 2013, the total number of admitted cases was 32428 cases; bed occupancy rate was 80.4%, bed residency rate was 2.8 days (MoH, 2013). Moreover, the hospital provides hemodialysis service for 96 adult ESRD patients resident in Khan Younis governorate, the total number of HD machines is 17, the total number of HD sessions provided in 2014 was 13,721 session (MoH, 2015).

Mohammed Al Najjar Hospital

Mohammed Al Najjar Hospital was established in 2000 on an area of 4 thousand meter squares. Located in the middle area of Rafah City, Al Najjar Hospital provides different medical specialties including medical and surgical services and HD service with a total beds capacity of 40 beds. In 2013, the total number of admitted cases was 6957 cases; bed occupancy rate was 80%, bed residency rate was 3.3 days (MoH, 2013). Moreover, the hospital provides hemodialysis service for 63 adult ESRD patients resident in Rafah governorate, the total number of HD machines is 12, the total number of HD sessions provided in 2014 was 6,372 session (MoH, 2015).

Abdelaziz Al Rantisi Hospital

Abdelaziz Al Rantisi Hospital was established in 2006 on an area of 2.5 thousand meter squares. Located in the western side of Gaza City, Abdelaziz Al Rantisi Hospital is a pediatric hospital provides different medical specialties including HD service with a total beds capacity of 49 beds. In 2013, the total number of admitted cases was 3306 cases; bed occupancy rate was 47%, bed residency rate was 5.5 days (MoH, 2013). Moreover, the hospital provides hemodialysis service for 22 pediatric ESRD patients resident in GG, the total number of HD machines is 8, and the total number of HD sessions provided in 2014 was 2747 session (MoH, 2015).

Annex (5): Self-administered Questionnaire
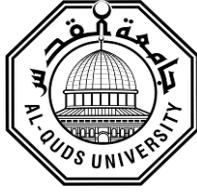
زميلي/ زميلتي العزيز/ة:

يسعدني جدا مشاركتك الفاعلة في بحث بعنوان الالتزام بسياسات واجراءات (بروتوكول) منع ومكافحة العدوى في وحدات غسيل الكلى في محافظات غزة.

وتهدف هذه الدراسة لتقييم مدى التزام مقدمي الخدمات الصحية بوحدات غسيل الكلى التابعة لوزارة الصحة في محافظات غزة ببروتوكولات منع ومكافحة العدوى مما قد يساعد في تقليل العدوى المنقولة داخل هذه الوحدات.

وهذه الدراسة ممولة ذاتيا من الباحث وهي جزء من متطلبات نيل درجة الماجستير في الصحة العامة بجامعة القدس أبوديس – فلسطين.

الوقت اللازم لتعبئة الاستبانة لا يتعدى خمس عشرة دقيقة، ولا يوجد أي احتمال للخطر أو عدم الراحة نتيجة لمشاركتكم، وجميع المعلومات سوف تستخدم لأغراض البحث العلمي فقط وستبقى سرية، ولا داعي لكتابة الاسم على الاستبانة.

يرجى الاجابة على جميع الأسئلة الواردة في الاستبانة وفق ماتراه مناسبا، حيث لا يوجد آراء صحيحة وأخرى خاطئة، سوف اكون موجودا في القسم خلال عملية جمع البيانات وجاهزا لأي استفسار.

لك كامل الحق بالاجابة علي الاستبانة أو رفض المشاركة، كما لك الحق بالانسحاب في أي وقت.

أشكركم علي حسن تعاونكم ومشاركتكم التي ستكون فاعلة.

الباحث/ رائد نصر كشكش

استبانة

التاريخ: __/__/2016   رقم مسلسل: _____

	معلومات شخصية ومهنية			
1.	الجنس: ☐ ذكر 0 أنثى			
2.	العمر: .... سنة			
3.	الحالة الاجتماعية: ☐ متزوج/ة ☐ أعزب ☐ مطلق/ة ☐ أرمل/ة			
4.	المستشفى: ☐ الشفاء ☐ ناصر ☐ شهداء الأقصى ☐ أبو يوسف النجار ☐ عبد العزيز الرنتيسي			
5.	المهنة: ☐ طبيب ☐ ممرض			
6.	أخر شهادة علمية حصلت عليها: ☐ دبلوم ☐ بكالوريوس ☐ ماجستير ☐ دكتوراة			
7.	المسمى الوظيفي: ☐ مدير ☐ رئيس قسم ☐ مشرف فترة ☐ رئيس شعبة ☐ أخرى :			
8.	سنوات الخبرة في وحدات غسيل الكلى: .... سنوات			
9.	سنوات الخبرة الكلية: .... سنوات			
10	الدخل الشهري الفعلي (ما يتقاضاه فعلياً من البنك): .... شيكل			

استبانة

	تقييم المعرفة باجراءات منع ومكافحة العدوى و مدى الالتزام بتطبيقها
11.	هل تعرف عن الاحتياطات المعيارية العالمية لمنع ومكافحة العدوى؟ ☐ نعم لا 0
12.	هل تعرف بوجود بروتوكول معتمد في فلسطين لمنع ومكافحة العدوى؟ ☐ نعم لا 0
13.	هل تعرف بوجود بروتوكول معتمد في فلسطين لمنع ومكافحة العدوى <u>خاص بوحدات غسيل الكلى؟</u> ☐ نعم لا 0
14.	هل يتوفر في القسم <u>نسخة</u> من بروتوكول منع ومكافحة العدوى المعتمد في فلسطين؟ ☐ نعم لا 0
15.	إذا كانت الإجابة نعم: فأين هي موجودة؟ ☐ غرفة العلاج ☐ الخزانة ☐ الدرج ☐ أخرى (............)
16.	هل يتم عمل مراقبة واستقصاء وبائي للعدوى المنقولة داخل المستشفى؟ ☐ نعم لا 0
17.	إذا كانت الاجابة نعم: اذكر اسم الجهة التي تقوم على الاستقصاء الوبائي للعدوى المنقولة داخل المستشفى ....
18.	هل تقدم المستشفى (الوزارة) تعليمات حديثة لمقدمي الخدمات الصحية حول منع ومكافحة العدوى؟ ☐ نعم لا 0
19.	هل شاركت بحضور تدريب وتعليم عن منع ومكافحة العدوى؟ ☐ نعم ☐ لا إذا كانت الاجابة نعم:
20.	كم عدد الدورات التي حصلت عليها؟ ....
21.	ما هو تاريخ أخر دورة حصلت عليها؟ ..../......./.....
22.	هل حصلت على معلومات كافية عن منع العدوى من خلال التدريب؟ ☐ نعم ☐ لا
23.	هل تقوم المستشفى (الوزارة) بتعزيز منع ومكافحة العدوى؟ ☐ نعم ☐ لا

	24.	إذا كانت الاجابة نعم: تقوم المستشفى بتعزيز منع ومكافحة العدوى بواسطة...

☐ تعليم داخلي ☐ تذكير في مكان العمل (بوسترات) ☐ تشجيع الأداء الجيد

☐ معاقبة الأداء السيء ☐ تعليمات مكتوبة ☐ أخرى

	25.	هل سبق وتلقيت تطعيم التهاب الكبد الوبائي؟

☐ نعم 0 لا

	26.	إذا كنت قد تلقيت تطعيم فكم جرعة ؟

☐ جرعة 0 جرعتين ☐ ثلاث جرعات

	27.	هل قمت بعمل فحص نسبة الأجسام المضادة لالتهاب الكبد الوبائي بعد التطعيم (Antibodies Titter)

☐ نعم ☐ لا

	28.	هل سبق وتعرضت لوخز إبر أو أدوات حادة مستخدمة؟

☐ نعم 0 لا

	29.	هل تعتقد بأنك تطبق احتياطات منع ومكافحة العدوى؟

☐ نعم 0 لا ☐ لا أعرف

	30.	حسب رأيك ما يعيق الالتزام ببروتوكولات منع ومكافحة العدوى؟ يمكنك اختيار اكثر من سبب ؟

☐ عدم وجود معلومات كافية حول منع ومكافحة العدوى

☐ عدم وجود تدريب حول منع ومكافحة العدوى

☐ زيادة ضغط العمل.

☐ نقص الأدوات اللازمة لتنفيذ منع العدوى.

☐ عدم وجود تعليمات مكتوبة.

☐ الاجراءات الوقائية التي تسبب مضاعفات مثل جفاف الجلد وتهيجه.

☐ عدم قيام الإدارة بالمحاسبة أو مراجعة الأداء.

☐ اجراءات منع ومكافحة العدوى غير ضرورية في وحدات غسيل الكلى.

☐ عدم وجود الرضا الوظيفي.

من فضلك تسجيل مدى توافقك مع العبارات التالية بوضع إشارة (√) في الخانة المناسبة

أوافق بشدة	أوافق	محايد	أعارض	أعارض بشدة	العبارة	
☐	☐	☐	☐	☐	منع ومكافحة العدوى مهم في وحدات غسيل الكلى	31.
☐	☐	☐	☐	☐	غسيل الأيدي باستمرار مهم لمنع العدوى	32.

	دائما	غالبا	أحيانا	نادرا	أبداً		
☐	☐	☐	☐	☐	استخدام الحواجز الوقائية (مثل القفازات والنظارات وغطاء الفم والانف والملابس الواقية) عند ملامسة اي من سوائل الجسم يقلل نقل العدوى	.33
☐	☐	☐	☐	☐	التعامل الصحيح مع الأدوات الملوثة يمنع أو يقلل نقل العدوى	.34
☐	☐	☐	☐	☐	تنظيف وتعقيم الأدوات التي تستخدم للمريض بشكل دوري يحد من العدوى	.35
☐	☐	☐	☐	☐	التخلص الصحيح والآمن من المخلفات الطبية يقلل أو يمنع خطر العدوى	.36

من فضلك تسجيل مدى التزامك بتنفيذ التعليمات التالية بوضع إشارة (√) في الخانة المناسبة

دائما	غالبا	أحيانا	نادرا	أبداً		
☐	☐	☐	☐	☐	ألتزم بارتداء الزي الخاص اثناء العمل	.37
☐	☐	☐	☐	☐	اغسل يدي لمدة (30-60) ثانية باستخدام الصابون والماء	.38
☐	☐	☐	☐	☐	أخلع الساعة أو المجوهرات عند غسل الأيدي	.39
☐	☐	☐	☐	☐	اغسل يدي قبل مخالطة المريض (المصافحة بالأيدي، مساعدة المريض على الحركة، الفحص السريري)	.40
☐	☐	☐	☐	☐	أغسل يدي بعد خطر التعرض لسوائل الجسم مباشرة (التعرض للدم من جهاز الغسيل الكلوي، سحب الافرازات، سحب الدم، التخلص من النفايات)	.41
☐	☐	☐	☐	☐	أغسل يدي بعد مخالطة المريض (المصافحة بالأيدي، مساعدة المريض على الحركة، فك المريض عن جهاز الغسيل الكلوي)	.42

دائما	غالبا	أحيانا	نادرا	أبداً	العبارة	
☐	☐	☐	☐	☐	أغسل يدي قبل مهمة التطهير لعمليات سحب الدم، تضميد الجروح، ادخال قسطرة وريدية طرفية أو مركزية، و تركيب المريض على جهاز الغسيل الكلوي)	.43
☐	☐	☐	☐	☐	أغسل يدي بعد مخالطة محيط المريض (تغيير مفروشات السرير، تعديل سرعة التروية، التوثيق على الملفات بعد التعامل مع ماكينة الغسيل الكلوي)	.44
☐	☐	☐	☐	☐	أرتدي قفازات لتجنب تعرض اليدين للدم او السوائل الأخرى من مرضى الغسيل الكلوي أو الأسطح الملوثة بما في ذلك جهاز الغسيل	.45

					العبارة	
					الكلوي	
☐	☐	☐	☐	☐	أرتدي قفازات معقمة عند القيام بأي اجراء يخترق الدفاعات الطبيعية للجسم وتركيب جهاز وريد مركزي أو قبل توصيل المريض بجهاز الغسيل الكلوي عن طريق الناصور الشرياني الوريدي.	.46
☐	☐	☐	☐	☐	أرتدي قفازات عند ملامسة اي ادوات ملوثة	.47
☐	☐	☐	☐	☐	اجراء فحوصات لقيروسات الكبد الوبائي والايدز مع بداية أول عملية غسيل	.48
☐	☐	☐	☐	☐	اعطاء المرضى غير المصابين بالتهاب الكبد الوبائي ثلاث جرعات من التطعيم.	.49
☐	☐	☐	☐	☐	عزل المرضى المصابين بالفيروسات المنقولة بالدم وتخصيص جهاز خاص لكل نوع من أنواع الفيروسات	.50
☐	☐	☐	☐	☐	استعمل ادوات معقمة وبطريقة معقمة للإجراءات الطبية التداخلية(قسطرة، وريد مركزي،..الخ)	.51
☐	☐	☐	☐	☐	أقوم باعادة تغطية أو ثني او كسر الإبرة قبل القائها	.52
☐	☐	☐	☐	☐	اقوم بفصل الإبرة المستخدمة عن السرنج قبل القائها	.53
☐	☐	☐	☐	☐	أقوم بإلقاء الإبرة والسرنج المستخدم في الصندوق الآمن	.54
☐	☐	☐	☐	☐	يتم تزويد الزوار بالألبسة الوقائية عند دخولهم وحدة غسيل الكلى	.55
☐	☐	☐	☐	☐	يتم استخدام المطهرات عالية الكفاءة في تنظيف وحدة المريض	.56
☐	☐	☐	☐	☐	يتم تطهير وتنظيف الجدران اسبوعيا بالمطهرات عالية الكفاءة.	.57
☐	☐	☐	☐	☐	يتم تطهير وتنظيف أسرة غسيل الكلى بين المريض والآخر	.58

دائما	غالبا	أحيانا	نادرا	أبداً	العبارة	
☐	☐	☐	☐	☐	يتم تعقيم جهاز غسيل الكلى من الداخل بالمطهرات وفقاً للشركة المنتجة	.59
☐	☐	☐	☐	☐	يتم تطهير جميع الأدوات المستخدمة للمريض بعد انتهاء عملية الغسيل وقبل استخدامها للمريض التالي (جهاز الضغط، السماعة)	.60
☐	☐	☐	☐	☐	يتم فرز النفايات وفقاً للدليل اللوني لاكياس النفايات	.61

شكرا لمساهمتك

Annex (6): Observational Checklists

I. Observation checklist for infection control practices

Profession: ☐ Doctor ☐ Nurse   Date: __/__/____

Serial No: _____   Hospital: _____

		Yes	No
1.	Wearing protective clothing as white coat (uniform).	☐	☐
2.	Hands were rubbed and residual soap was removed under running water (30- 60) seconds.	☐	☐
3.	Removing jewelry, hand watch, and ring when washing hands.	☐	☐
4.	Hand washing before touching the patients.	☐	☐
5.	Hand washing after touching blood or body fluids.	☐	☐
6.	Hand washing after working with patients.	☐	☐
7.	Hand washing before performing a septic invasive procedures.	☐	☐
8.	Wash my hands after contact with patient surroundings.	☐	☐
9.	Drying hands with clean paper towel.	☐	☐
10.	Turn of water after hand washing using paper towel.	☐	☐
11.	Wear gloves when contact with blood or other body fluids.	☐	☐
12.	Wearing sterile gloves when doing invasive procedure.	☐	☐
13.	Use clean gloves when handling contaminated instrument.	☐	☐
14.	Always cleaning and disinfecting surfaces in the dialysis station.	☐	☐

15.	Purge and clean the walls of a week of high efficiency disinfectant.	☐	☐
16.	Clean and disinfect environmental surfaces between patients.	☐	☐
17.	Sterilize the dialysis machine from the inside with disinfectant according to the company producing.	☐	☐
18.	Clearing all the tools used for the patient after washing and before the end of the process used for the next patient (pressure device, handset, tweezers, scissors).	☐	☐
19.	Use a separate dialysis machine for patients with known blood borne Infection.	☐	☐
20.	Use a sterile set of equipment for each patient.	☐	☐
21.	Recapping used needles before disposal.	☐	☐
22.	Remove used needles from syringes before disposal.	☐	☐
23.	Disposal of sharps in Safety box.	☐	☐
24.	Labeling and separating waste disposals.	☐	☐
25.	Visitors wear protective clothing before entering hemodialysis unit.	☐	☐

II. Observation checklist for Physical Environment

Date: __/__/____   Serial No: _____

Hospital: _____

		Yes	No
1.	There is adequate space around each bed for easy movement of the team.	☐	☐
2.	Rubbing Alcohol lotion are available in the unit.	☐	☐
3.	Patient units are clean (no blood, dust, or other dirty).	☐	☐
4.	Doctor's room is clean (no blood, dust, or other dirty).	☐	☐
5.	Nursing room is clean (no blood, dust, or other dirty).	☐	☐
6.	The unit in general is clean (kitchen, bathroom, toilette …etc	☐	☐
7.	All supplies for hand washing are available (water source, a sink, soap bar, or liquid soap, and tissue paper).	☐	☐
8.	There are sufficient disposables and linen to prevent re use.	☐	☐
9.	There are sharp disposal containers in each room.	☐	☐
10.	The non-sterile gloves are available in the unit.	☐	☐
11.	The sterile gloves are available in the unit.	☐	☐
12.	Each bed in the unit is covered by clean linen.	☐	☐
13.	Customize place to deal with contaminated instruments reusable.	☐	☐
14.	There is Isolation room in each department for patient with blood borne disease.	☐	☐
15.	The allocation of nursing staff to treat isolated patients during hemodialysis.	☐	☐
16.	Provide all the necessary tools and materials in the isolation area and be separate from those for other patients.	☐	☐
17.	Provide adequate space for the storage of clean and sterile materials away from the patient's service area.	☐	☐
18.	There is an accumulation of medical waste inside the hemodialysis unit.	☐	☐
19.	Allocation area appropriately sized for water treatment unit.	☐	☐
20.	Allocation separated area to store contaminated material.	☐	☐

Annex (7): List of Experts

No.	Name	Position
1.	Dr. Bassam Abu Hamad	School of public Health Al Quds University
2.	Dr. Yahia Abed	School of public Health Al Quds University
3.	Dr. Shereen Ayoub	Ministry of Health
4.	Dr. Mazen Abu Qamar	School of public Health Al Quds University
5.	Dr. Mohammad Tabash	Al-Azhar University
6.	Dr. Rami Alabadla	Ministry of Health
7.	Dr. Marwan Arafat	Ministry of Health
8.	Mr. Suliman Eledaini	Ministry of Health

Annex (8): Helsinki Approval

المجلس الفلسطيني للبحث الصحي
Palestinian Health Research Council

تعزيز النظام الصحي الفلسطيني من خلال مأسسة استخدام المعلومات البحثية في صنع القرار

Developing the Palestinian health system through institutionalizing the use of information in decision making

Helsinki Committee
For Ethical Approval

Date: 03\08\2015   Number: PHRC/HC/48 /15
Name: الاسم: رائد نصر كشكش

We would like to inform you that the   نفيدكم علماً بأن اللجنة قد ناقشت مقترح دراستكم
committee had discussed the proposal of
your study about: حول:-

Health Care Provider's Compliance with the Infection Control Practices in
Hemodialysis Units- Gaza Governorates

The committee has decided to approve   و قد قررت الموافقة على البحث المذكور عاليه
the above mentioned research.   بالرقم والتاريخ المذكوران عاليه
Approval number PHRC/HC/48 /15 in its
meeting on 03/08/2015

Signature

Member   Member

Chairman

Genral Conditions:-   Specific Conditions:-
٢٨. Valid for 2 years from the date of approval.
٢٩. It is necessary to notify the committee of any change
in the approved study protocol.
٣٠. The committee appreciates receiving a
copy of your final research when
completed.

The subject was approved following the World Medical Association Declaration of Helsinki-Ethical principles for medical research
involving human subjects, adopted by the 18th World Medical Association General Assembly, Helsinki, Finland, June 1964 and
amended by the 59th WMA General Assembly, Seoul, Korea, October 2008.

E-Mail:pal.phrc@gmail.com

Gaza - Palestine   غزة – فلسطين
شارع النصر - مفترق العيون

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Annex (9): MoH Approval

The Palestinian National Authority	السـلطة الوطنية الفلسطينيـة
Ministry of Health	وزارة الصحــة
Directorate General of Human Resources Development	الإدارة العامـة لتنميـة القـوى البشـريـة

التاريخ:2015/07/15م   الرقم :..........

لجميع الإخوه مدراء المستشفيات برجاء الإطلاع والإيعاز ...

الأخ / د. عبد اللطيف الحاج   المحتـرم،،،

مدير عام المستشفيات

السلام عليكم ورحمة الله وبركاته،،،

الموضوع/ تسهيل مهمة باحث

بخصـــوص الموضـــوع أعــــلاه، يرجــى تســهيل مهمــة الباحـــ .... انـد نصـير كشــكش

الملتحــق ببرنـــامج ماجســتير الصـحة العامـة– مسـار الإدارة الصـحية – جامعـة القـدس فـي

إجراء بحث بعنوان :-

"Health Care Providers Compliance with the Infection Control Practices in Hemodialysis Unit, Gaza Governorates"

حيث الباحث بحاجة لتعبئة استبانه من عدد من الأطباء والممرضين العاملين في أقسام غسيل الكلى وتعبئــة

نموذج ملاحظة خاص بالإجراءات المتبعة لمكافحة العدوى في أقسام غسيل الكلى في المستشفيات، وكــذلك

عقد مجموعة بؤرية للجان مكافحة العدوى والمسئولين في أقسام غسيل الكلى، بما لا يتعارض مع مصلحة

العمل وضمن أخلاقيات البحث العلمي، و دون تحمل الوزارة أي أعباء أو مسئولية.

وتفضلوا بقبول التحية والتقدير،،،

د. ناصر رأفت أبو شعبان

مدير عام تنمية القوى البشرية

الإدارة الصحة
الإدارة العامـة للمستشفيات
وارد
الرقم : 8114
التاريخ: 26 / 7

صورة لــ/
- الإدارة العامة للرقابة الداخلية
- صاحب العلاقة

15/1000
٢٥ 7 21

الإدارة العامة للمستشفيات
صادر
رقم:....7039
التاريخ: 7/2015

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Annex (10): Distribution of participants' commitment to wear uniform during working time

Variable		Physicians		Nurse		Mean %	χ²-value	P-value
		Yes	No	Yes	No			
Wearing uniform	No.	10	9	54	4	83.11	16.488•	0.000*
	%	52.6	47.4	93.1	6.9			

• Fisher's Exact test; * Statically Significant

Annex (11): Distribution of participants' injury during working time

Variable		Physicians		Nurse		Mean %	χ²-value	P-value
		Yes	No	Yes	No			
Injury from used sharp medical instruments	No.	7	12	36	22	55.8	3.694	0.049*
	%	36.8	63.2	62.1	37.9			

* Statically Significant

Annex (12): Distribution of isolation of patients with known blood borne diseases

Variable		Physicians		Nurse		Mean %	χ²-value	P-value
		Yes	No	Yes	No			
Isolating patients with known blood borne infection	No.	16	3	55	3	92	2.216•	0.156
	%	84.2	15.8	94.8	5.2			

• Fisher's Exact test

Annex (13): Distribution of study participants practice in protection of patients from visitors

Variable		Physicians		Nurse		Mean %	χ²-value	P-value
		Yes	No	Yes	No			
Protection of hemodialysis patients from visitors	No.	5	14	14	43	25	0.023•	0.550
	%	26.3	73.7	24.6	75.4			

• Fisher's Exact test

Annex (14): Distribution of participants' commitment to wear uniform during working time

Variable		Physicians		Nurse		Mean %	χ²-value	P-value
		Yes	No	Yes	No			
Wearing uniform	No.	19	38	144	27	71.5	54.294	0.000*
	%	33.3	66.7	84.2	15.8			

* Statically Significant

Annex (15): Distribution of study participant and isolation of patients with known blood borne infection

Variable		Physicians		Nurse		Mean %	χ²-value	P-value
		Yes	No	Yes	No			
Isolating patients with known blood borne infection	No.	48	9	141	30	82.9	0.093	0.469
	%	84.2	15.8	82.5	17.5			

Annex (16): Distribution of study participants regarding using a sterile set of equipment for each patient

Variable		Physicians		Nurse		Mean %	χ²-value	P-value
		Yes	No	Yes	No			
Using a sterile set of equipment for each patient	No.	57	0	167	4	98.2	1.351	0.314
	%	100	0	97.7	2.3			

Annex (17): Distribution of study participants regarding protection of patients from visitors

Variable		Physicians		Nurse		Mean %	χ²-value	P-value
		Yes	No	Yes	No			
Protection of hemodialysis patient from visitors	No.	0	57	3	168	1.3	1.009•	0.420
	%	0	100	1.8	98.2			

• Fisher's Exact test

Abstract in Arabic

مدى إلتزام مقدمي الخدمة الصحية في وحدات الغسيل الدموي في قطاع غزة ببروتوكول منع و مكافحة العدوى

اعداد الباحث / رائد نصر خالد كشكش

اشراف/ د. أشرف يعقوب الجدي

ملخص الدراسة:

يعـرف مـدى إلتـزام مقدمـي الخدمـة الصحية بروتوكـول منـع و مكافحـة العـدوى بمـدى تطـابق الممارســة العمليـة مــع توصـيات بروتوكــول منـع و مكافحـة العـدوى. تعتبـر العـدوى هـي السـبب الكثـر إنتشـارا للتـداوي بالمستشـفيات و تعتبـر كـذلك السـبب الثـاني الأكثـر شـيوعا للوفيـات بـين مرضـى الغسـيل الـدموي بعـد أمـراض القلـب و الأوعيـة الدمويــة. و تعـاني الخـدمات الصـحية المقدمـة بالمستشـفيات مـن العبـئ المـالي المرتفــع علــى النظـام الصـحي النـاتج عـن مضـاعفات إنتشـار العـدوى داخـل المستشـفيات و التـي تصـيب مئـات الملايـين مـن المرضـى سـنويا و التـي قـد تـؤدي مضاعفاتها الى الوفاة.

الهدف من الدراسة:

الهـدف العـام مـن هـذه الدراسـة هـو تقيـيم مـدى إلتـزام مقدمـي الخدمـة الصـحية فـي وحـدات الغسـيل الـدموي فـي قطـاع غـزة ببروتوكـول منـع و مكافحـة العـدوى مـن أجـل خفض معدل المراضة و الوفيات لمرضى الغسيل الدموي.

منهجية الدراسة:

الدراســــة عبــــارة عــن دراســـة وصـفية تحليليــة شــملت البيانــات الكميــة و النوعيــة. تـم جمـع البيانـات بإسـتخدام أربعـة أدوات أولاهـا إسـتبانة يـتم تعبئتهـا بواسـطة مقـدمي الخدمــة الصـــحية فــي أقســام الغســيل الــدموي بالإضافة الــى قائمــة فحـص تخـتص بتقيـيم اداء مقـدمي الخدمــة الصـحية فـي أقسـام الغسـيل الـدموي كـذلك قائمـة فحـص اخـرى تخـتص بتقيـيم جاهزيـة أقسـام الغسـيل الـدموي مـن حيـث بيئـة العمـل بالإضافة الــى عقـد جلسـة مـع مجموعـة بؤريـة فـي الموضـوع المحـدد. فـي المجمـوع، تـم جمـع 77 اسـتبانة ذاتيـة التعبئـة مـن مقـدمي الخدمـة الصـحية فـي أقسـام الغسـيل الـدموي ، 228 قائمـة فحـص تخـتص بتقيـيم اداء مقـدمي الخدمـة الصـحية فـي أقسـام الغسـيل الـدموي، و 5 قـوائم فحـص تخـتص بتقيـيم جاهزيـة أقسـام الغسـيل الـدموي مـن حيـث بيئـة العمـل ، و جلسـة مـع مجموعـة بؤريـة فـي الموضـوع المحـدد . تـم تحليـل البيانـات باسـتخدام برنـامج الحزمـة الإحصـائية للعلـوم الاجتماعيـة (SPSS) حيـث أجريـت التوزيعـات، التكـرارات والنسـب المئويـة، الجـداول، كمـا حسـبت النسـب المئويـة العامـة وجـداول المتقاطعـة و تـم اسـتخدام Chi-Square بالإضافة الــى بعـض التحاليـل الأخرى لإيجاد العلاقات بين المتغيرات.

أهم النتائج:

أظهـرت نتـائج الدراسـة أن مسـتوى التـدريب و المعرفـة لـدى مقـدمي الخدمـة الصـحية فـي أقسـام الغسـيل الـدموي المشـاركين فيهـا عـن بروتوكـول منـع و مكافحـة العـدوى ليسـت عاليـة. ومـع ذلـك، هنـاك موقـف إيجـابي بـين مقـدمي الخدمـة الصـحية فـي أقسـام الغسـيل الـدموي حـول بروتوكـول منـع و مكافحـة العـدوى و و أهميتـه. واتفـق

غالبية المشاركين في الدراسة على أهمية ضرورة تطبيق بروتوكول منع و مكافحة العدوى في الخدمة المقدمة في أقسام الغسيل الدموي. وكشفت نتائج الدراسة أن إدارة المستشفى لا تمارس دورها بكفاءة في تشجيع مقدمي الخدمة الصحية في أقسام الغسيل الدموي للإلتزام ببروتوكول منع و مكافحة العدوى.

و أظهرت نتائج الإستبانة أن معدل الإلتزام بإرتداء الزي الخاص بالعمل كان 83.11%، معدل الإلتزام بغسيل الأيدي كان 72.54%، معدل الإلتزام بإرتداء القفازات كان 82.14%، معدل الإلتزام بإستخدام المطهرات كان 77.01%، معدل الإلتزام بممارسات العمل الآمنة كان 41.88%، بينما اظهرت نتائج تقييم الاداء الميداني لعملهم أن معدل الإلتزام بإرتداء الزي الخاص بالعمل كان 71.5%، معدل الإلتزام بغسيل الأيدي كان 52.24%، معدل الإلتزام بإرتداء القفازات كان 92.84%، معدل الإلتزام بإستخدام المطهرات كان 67.11%، معدل الإلتزام بممارسات العمل الآمنة كان 75.33%. و أظهرت نتائج الدراسة أن 55.8% من مقدمي الخدمة الصحية في اقسام الغسيل الدموي قد أصيبوا بوخزات من إبر أو أدوات مستخدمة، 67.5% من مقدمي الخدمة الصحية في اقسام الغسيل الدموي قد تلقوا ثلاثة جرعات تطعيم ضد مرض إلتهاب الكبد الوبائي. و أخيرا، أظهرت نتائج الدراسة أن أهم معايقات تطبيق بروتوكول منع و مكافحة العدوي في اقسام الغسيل الدموي هي نقص الأدوات التجهيزات اللازمة، نقص المعرفة و التدريب، ضعف الإشراف الإداري، غياب المحاسبة و التغذية الراجعة، و ضغط العمل.

الخلاصة:

هنـاك حاجـة ماسـة الـى اعتمـاد بروتوكـول وطنـي شـامل لمنـع و مكافحـة العـدوي يخـتص بأقسـام الغسـيل الـدموي، تنفيـذ بـرامج توعيـة و التـدريب المسـتمر حـول بروتوكـول منـع و مكافحـة العـدوى، توزيـع نسـخ مـن البروتوكـول، تفعيـل نظـام المتابعـة و التـدقيق لمـدى الإلتـزام ببروتوكـول منـع و مكافحـة العـدوى، إجـراء المزيـد مـن الدراسـات والأبحـاث، بمـا فـي ذلـك الابحـاث ذات الطـابع الكمـي بالإضـافة الـى الأبحـاث النوعيـة ذات الفهـم عميـق لجميـع العوامـل ذات الصـلة التـي قـد تـؤثر علـى مدى إلتزام مقدمي الخدمة الصحية ببروتوكول منع و مكافحة العدوى.

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