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Assessment of Injection Safety in Primary Health Care Centers - Gaza Governorates

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Assessment of Injection Safety in Primary Health Care Centers - Gaza Governorates

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Dedication

I dedicate this thesis

To my mother and father for their endless love, support and encouragement,

To my brothers and sisters,

To the souls of all martyrs who sacrificed themselves for the sake of Palestine to give us the freedom we deserve,

To all those who encouraged and helped me to complete this work

To all of them I dedicate this work

Maysoon Mahmoud Abu Rabee

Declaration

I certify that this thesis submitted for the degree of Master, is the result of my own research, except where otherwise acknowledged, and this study (or any part of the same) has not been submitted for a higher degree to any other university or institution.

Signed:

Maysoon Mahmoud Abu Rabee

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With respect

Maysoon Mahmoud Abu Rabee

Abstract

Safe injection practice is considered as an important component of basic infection control. It includes measures taken to perform injections in a manner that is safe for patients and providers. Unsafe injection may transmit various blood borne infections. Injection safety is still neglected in low-countries due to overwhelming social, economic and political challenges and put the patients and healthcare providers at risk of infectious and non-infectious adverse events. This study was conducted to assess the injection safety practices and management systems in Primary Health Care centers (PHCCs) in Gaza Governorates.

The design of this study is a mixed-methods one, in which data has been triangulated (quantitative and qualitative). This study is a descriptive analytical cross-sectional one. This design was used to assess the injection safety practices and management in thirty primary health care centers in Gaza Governorates (11 PHCCs in Ministry of Health (MOH) & 19 PHCCs in United Nation Relief and Works Agency for Refugees in The Near East (UNRWA)). A cluster sample from primary health care workers in Ministry of Health and UNRWA health care facilities were selected. In total, 360 health care workers, 5 working stations in 5 Government and 5 UNRWA clinics were included. Beside this In-depth interviews were carried out with six Key informants in both UNRWA and MOH. Data was collected through a self-administered questionnaire, observation checklist and in-depth interviews with key informants with response rate 100%. The statistical Package for Social Science software version 20 was used for the quantitative data entry and analysis while open coding thematic technique was used to analysis qualitative data.

Results revealed that 52.2% of health workers had good knowledge of key injection safety issues. These groups showed higher knowledge score in UNRWA as service providers (P value < 0.01), staff that had training on injection safety (P value 0.002), senior medical officer as job title of the staff (P value 0.003) and diploma holder of staff (P value 0.021). During in depth interview key informant pointed the accumulative experience of head nurses due to attendance of several workshops and seminars of injection safety and two of them said that it's due to the main cause that the role of head nurse is to supervise others, so she supposed to be more knowledgeable Also in this study showed differences in practice of injection safety in relation to health facility and education level of health workers. These groups showed accidental of needle stick injuries accrued more between health workers in MOH health centers, training regarding injection safety was more between health workers in MOH health centers, but these differences did not reach to statistically significant level. Vaccinated against hepatitis B was more among health workers in UNRWA health centers, this difference reached to statistically significant (P value 0.002). Relationship between accidental needle stick injuries, vaccinated of hepatitis B and education level of health workers reached to statistically significant (P value 0.00, 0.002 respectively). Most of health care workers had received full doses of Hepatitis B vaccine and were knowledgeable about at least one pathogen transmitted through unsafe injection practices. Injection safety management policy and waste disposal guideline was not available for viewing in any of the facilities. Although that during in-depth interview with Key informants. All of MOH teams emphasized that no written protocols or guidelines at MOH health facilities, in the other hand all UNRWA team insist that hard and soft copy protocols and guidelines are available and updated in 2010. During observation checklist the researcher observed the office staff who disposed the bio-medical wastes without taking any safety measures. Moreover, none of these staff had received any formal training in waste management but during in depth interview half of key informants said designated staff that handles healthcare waste received training in waste management and other half mentioned that they did not receive training. Improper infection control practices among health providers and poor health care workers protection. All health care workers did not wash their hands by soap and water or cleaned them by alcohol before or after giving injection and the researcher observed 40% of overflowing pierced or open safety boxes in all health facilities.

The study concluded that there are different gaps in injection safety at primary health care centers in the Gaza Strip, all gaps can be bridge through regular and on job training, supported by Information Education and Communication programs. There is need for periodic injection safety assessment in all health facilities by the relevant stake holders.

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List of abbreviations

AD	Auto-Disable
AIDS	Acquired Immune Deficiency Syndrome
BBVDs	Blood Borne Viral Diseases
BCG	Bacillus of Calmette and Guerin
CDC	Centers for Disease Control and Prevention
DFID	Department for International Development
GGs	Gaza Governorates
GS	Gaza Strip
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HCWM	Health Care Waste Management
HCWs	Health Care Workers
HIV	Human Immunodeficiency Virus
IPC	Infection Prevention and Control
IS	Injection Safety
MOH	Ministry of Health
NGOs	Non-Governmental Organization
NSI	Needle Stick Injury
NUG	National Unity Government
PCBS	Palestinian Central Bureau of Statistics
PHC	Primary Health Care
PHCCs	Primary Health Care Centers
PHCWs	Primary Health Care Workers
SIGN	Safe Injection Global Network
SMO	Senior Medical Officer
SOP	State of Palestine
SOPH	School of Public Health
SPSS	Statistical Package for Social Science
UNDP	United Nation Development Program
UNRWA	United Nation Relief and Works Agency for Refugees in The Near East
USEPA	United States Environmental Protection Agency
WHO	World Health Organization

Chapter I

Introduction

1.1 Introduction

In medical care, an injection is the introduction of a drug, vaccine, contraceptive or other therapeutic agent into the body using a needle and syringe. Injections are among the most common health care procedures throughout the world. Sixteen billion injections are administered annually in developing and transitional countries (World Health Organization-WHO, 2012a). In countries where unnecessary injections are common, the average number of injections per person has been estimated to be 3.7 per year and half of them are estimated to be unsafe injections (Hutin et al., 2003).

The term "injection safety" was initially used once it was recognized in terms of being thought of injections as intramuscular. It is the main leading cause of transmitting Human Immunodeficiency Virus (HIV) and hepatitis viruses. Recently, the term has been broadened to include other means of parenteral injection of substances (intravenously), withdrawing of blood (phlebotomy) or for intravenous/intra-arterial access (catheters in veins or arteries). Thus, the term used in this protocol is "injection safety," the safety of additional medical procedures involves intravascular injection (World Health Organization-WHO, 2012B). Injection safety includes practices aims at preventing transmission of infectious diseases between one patient and another, or between a patient and healthcare provider, and also to prevent harms such as needle stick injuries (Perz et al., 2010).

Some injections are often unnecessary and unsafe. These unsafe injections are responsible for millions of cases of Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV), and an estimated one-quarter of a million cases of HIV annually. Re-use of injection equipment without sterilization is frequently a big problem. Therefore, it is important to assess these unsafe injection practices and outcomes with results to aware policy decisions. WHO defined safe injection as an injection that does not harm the recipient, does not expose the health care worker to any avoidable risks and does not result in any waste that is dangerous to the community (WHO, 2010a).

Assessment of safe injection estimates the frequency of unsafe injection practices in specified services. It determines whether a facility where injections are given meets the necessary requirements for equipment, supplies and waste disposal. It also identifies unsafe practices that may lead to infections, such as whether the critical steps of an injection

administration are executed or not. Furthermore, it estimates the proportion of health care facilities where injection practices are safe. Three major considerations are especially relevant in the assessment of potential unsafe injections practices: the safety of the injection recipient, the safety of the health care worker, and the safety of the community. Recommendations following an assessment should focus upon these considerations in regard to injection safety interventions.

1.2 Research Problem

Unsafe injections and improper handling of injection waste stand the risk of acquiring blood borne diseases among many people in developing countries. Globally, in the years 2002, approximately 20 million new HBV infections, 2 million new HCV infections, and 250,000 new HIV infections are associated with using unsafe injection (Ezzati et al., 2002).

The last outbreaks attributed to unsafe injection practices in U.S has appeared substantially over recent years. Since 2001, at least 49 outbreaks have occurred because of extrinsic contamination of injectable medical products at the point of administration (Guh et al., 2012; CDC, 2013). Twenty-one of these outbreaks involved transmission of HBV or HCV; the other 28 represented outbreaks of bacterial infections, primarily invasive bloodstream infections. Nearly 90% of these known outbreaks occurred in outpatient settings. Although hundreds of patients became infected in this outbreak, there is an additional burden of the estimated 150,000 patients during 2001–2012 who required notification advising them to undergo blood borne pathogen testing after their potential exposure to unsafe injections (Guh et al., 2012; CDC, 2013).

Hepatitis C virus (HCV) is a blood borne pathogen responsible for a substantial proportion of cases of post-transfusion hepatitis, liver cirrhosis and hepatocellular carcinoma (CDC, 2013). The most commonly identified routes of HCV transmission in developed countries include intravenous drug use, blood transfusions, haemodialysis, needle-stick injuries among health professionals, tattooing, sexual intercourse and prenatal infections (Ezzati et al., 2002). In developing countries, the reuse of needles and syringes without sterilization for therapeutic injections has been implicated as a vehicle for transmission of blood borne organisms including hepatitis B virus (HBV), human immunodeficiency virus (HIV).

In the 1980s more than 10,000 children were infected with HIV as a result of unsafe healthcare in Romania, and the majority infected by unsafe injections. At the same time there were only 13 adult cases of AIDS reported in Romania. Compared to Egypt one of

five adults has contracted hepatitis C from unsafe medical injections, and liver disease has become a more important cause of death and disability than the diseases the injections were intended to treat them (Strickland, 2006).

Miller and Pisani, (1999) estimated a global financial cost of infection resulting from unsafe injections that lead to costs of 535 million $ per year in direct medical expenses, and calculate that unsafe injection practices are associated annually with 1.3 million deaths and 26 million years of life lost.

Injection safety is a known public health issue in the world but not studied yet in Gaza Strip (GS). This research will assess the existing situation regarding injection safety among different health care providers and health facilities to submit recommendations that could be helpful for decision makers to improve gaps if founded.

1.3 Justification

Injected medicines are commonly used in healthcare settings for the prevention, diagnosis, and treatment of various diseases. Unsafe injection practices expose patients and healthcare providers as well to infectious and non-infectious risk, adverse events and have been associated with a wide variety of procedures and settings. This harm is preventable. Safe injection practices are part of Standard Precautions and are aimed at maintaining basic levels of patient safety and provider's protection. A safe injection is defined as an injection that does not harm the recipient, does not expose the health workers to any avoidable risk and does not result in waste that is dangerous for the community (WHO, 2010b)

Safety injection practices in the PHCCs reflect the quality of supervision, resource allocation and provision of technical support, therefore there is a real need to assist and update the records on injection safety practices in the PHCCs periodically in Gaza Governorates. The study outputs will be used to advise policy makers to promote the capacities of facilities in ensuring good injection safety practices.

In Palestine, the management of medical waste was not given the proper attention (Khala, 2009). In GS the segregation is done only for sharps and there are no colour-coded bags. Medical waste is stored and disposed of with domestic waste in primary health care clinics, and it is incinerated in hospitals, but there are no emission control or safety measures. In addition there are some gaps in knowledge of health care workers, and current practices are inadequate (Massrouji, 2001). This study aimed to assess the knowledge, and practice of injection safety and HCWM is important as increasing the knowledge, positively changing the attitude, practice of injection safety and HCWM through training of the healthcare

workers will go a long way minimizing/eliminating risks associated with unsafe injection practices and improper HCWM.

1.4 Main Objective

The general objective of this study is to assess the injection safety practices and management systems leads to promote injection safety in primary health care centers in Gaza Governorates.

1.5 Specific Objectives

1) To examine the presence of applied guidelines, protocols or other references for injection safety in the PHCCs.

2) To analyze the availability of injection logistics and supplies.

3) To determine the process of medical waste disposal discarded.

4) To provide policy and decision makers with recommendations to modify existing policies or formulate new ones in regard to injection safety in immunization and therapeutic services.

1.6 Study Context

This study will be conducted at PHC centers of GS. Services of PHC influenced by many factors such as: political situation, demography and geography, socioeconomic, and health services in GS.

1.6.1 Demography and Socio- economic Context:

The GS is located in the Middle East (at 3125'N 34º 20'E), on the eastern coast of the Mediterranean Sea, to the north of Egypt and the west southern edge of Palestine. It is approximately 50 kilometers long, and between 6 and 12 kilometers wide, with a total area of 365 square kilometers. The GS has an arid climate, with mild winters, and dry, hot summers subject to drought (Liphchin, 2007). Environmental problems in GS include desertification; water salination, improper sewage treatment and scare water resources (Hamdan et al., 2008).

The total population of Palestine at mid-2014 was about 4.55 million; 2.31 million males and 2.24 million females. The estimated population of GS totaled 1.8 million of which 894 thousand males and 866 thousand females. The percentage of urban population in mid year 2014 was 73.9%, while the percentage of population in rural and camps areas was 16.7% and 9.4% respectively. Data revealed that the population of Palestine is a young

population; the percentage of individuals aged (0-14) constituted 39.7% of the total population at mid 2014 of which 37.6% in the West Bank (WB) and 43.2% in GS. The elderly population aged (65 years and over) constituted 2.9% of the total population of which 3.2% in the WB and 2.4% in GS of mid 2014 as reported by the Palestinian Central Bureau of Statistics (PCBS) (PCBS, 2014).

Gaza economy had come to a near standstill due to a combination of unemployment, closures, and restrictions placed on workers, industries, goods and services (UNDP, 2012). According to the World Bank, Gaza has one of the highest joblessness rates world-wide. The average unemployment rate during 2015 stood at 41.1%, 36 % for men and 59.6 % for women, as reported by the Palestinian Central Bureau of Statistics (PCBS). The picture is even bleaker for youth: in the first quarter of 2016, unemployment rate for Palestine refugee youth stood at 64.5% and for female refugee youth at 78 % with around 5 million refugees in the region reliant on the United Nations for basic services. Israel's blockade of GS has not dislodged Hamas, but the economy, institutions and civil society are all suffering in a process described by the UN as de- development (Gaza Situation Report, 2016). Israel relaxed some access restrictions after the events of summer 2010, but the situation remains bleak and fragile, and future humanitarian crises cannot be ruled (DFID, 2014).

1.6.2 Political Context

The WB and the GS have been under occupation by Israel since 1967. The Palestinian National Authority was established in 1994 following the Oslo agreement. However, there has been ongoing political turmoil and economic decline sparked, in particular, by the second intifada in September 2000 and in 2006, international community withdrew direct financial support for the Palestinian National Authority following the election of Hamas. In February 2007, a National Unity Government was formed but was not widely supported and was short- lived. Factional clashes continued and in Jun 2007 Hamas took over control of the GS. The ongoing Israeli blockade, imposed in June 2007 after Hamas took- over control of the GS. This action crippled the private sector, driving unprecedented numbers of Palestinian into unemployment and poverty. The situation in the GS was further exacerbated as a result of the Israeli military actions during the years 2008, 2012 and 2014. By these wars vital infrastructure was damaged or destroyed, including manufacturing and commercial units, housing and other buildings, electricity, water and sanitation services.

Access to health care for ordinary patients was severely restricted during the conflict and continued as a result of Israeli blockade (Saleh, 2012).

It can be concluded from all above' that any attempts to improve health status and solve health problems in this region will be less effective unless root causes of these problems would be addressed by ending the occupation, eliminating siege and rehabilitation of the economy.

1.6.3 Health Status Context

The Palestinian Ministry of Health (MOH), UNRWA and (NGOs) together provide extensive geographic coverage of public health and non-profit primary health care services, especially preventive health services and immunizations. However, the burden on households is high (39.8% of health expenditure comes from the general population) and two thirds of health expenditure concern curative care. The restrictions imposed on the movement of patients, health staff and goods have hindered the functioning and development of the health system. In recent years, the functioning of the MOH, the main health provider, has been seriously affected by the financial crisis of the Palestinian Authority. This has reduced the MOH's ability to procure adequate stocks of essential drugs and medical disposables; the Ministry reported that for 2013, an average of 29% of essential drugs and 52% of disposables were out of stock in GS. Although referrals increased by 10% compared with 2012 – in part owing to shortages of medicines – the financial crisis has also led to an increase in debts to specialized hospitals for the care of patients referred within and outside the occupied Palestinian territory (PCBS, 2013).

MOH in June 2012 reported that the cumulative number of patients with HIV or AIDS since 1987 reached 72 cases in the Occupied Palestinian Territory. There are 29 cases is GS during the period without referring to transmission means. Eight of whom are still alive and receiving treatment and support from the UNDP Global Fund Programme (UNDP, 2012). During the year 2014, only one case of infection was reported with an incidence rate of 0.06/100.000 population. The same incidence was reported in the years 2012 and 2013, while five cases were reported in the year 2011 with an incidence of 0.31/100.000 population. By the end of the year 2014 in GS, there are a total of 11 cases living with HIV/AIDS with a prevalence of 0.62/100.000 population. According to national adopted treatment protocol, seven of them are under treatment and four are non-eligible for treatment was reported to epidemiological department in GS (Annual epidemiological report, 2014).

257 cases of HBV have been recorded in 2014 (6 cases with acute Hepatitis B and 251 with Hepatitis B carriers) and 54 new cases of HCV were reported to epidemiological department in GS without referral to cause of transmission (Annual Epidemiological Report, 2014).

1.6.4 Health Services

The quality of the public health sector needs to be substantively improved. Most public health facilities are unable to provide safe and adequate services and need to be rehabilitated or upgraded. While Israeli authorities permit the access of medical supplies into Gaza, there are frequent breakdowns of medical equipment resulting from power interruptions and water impurities, among other factors. For this and other reasons, many patients are forced to seek treatment outside Gaza for a wide range of medical problems, which is difficult due to the movement restrictions imposed by the blockade (UNRWA Operational Response, 2013).

The MOH of the SOP owns and operates the largest network of facilities, with 72 PHC centers and 18 hospitals in GS. The MOH provides preventive health services through four primary health care levels. Private and nongovernmental organization, hospitals make an important contribution to the provision of tertiary care services. Tertiary services are purchased by the MOH from the local private sector such as the Eastern Jerusalem Hospitals, and from hospitals in Israel, Jordan and Egypt for patients have the health insurance. The majority of cases are referred by MOH medical committees to non- MOH facilities while others are referred by the Humanitarian Aid Committee in the Ministers cabinet. UNRWA beneficiary populations are undergoing a demographic transition: People are living longer and developing different needs, particularly those related to non-communicable diseases (NCDs) and chronic conditions that require lifelong care, such as diabetes, hypertension and cancer. A healthy life is a continuum of phases from infancy to old age, each of which has unique, specific needs, and our programme therefore takes a ‘life-cycle approach’ to providing its package of preventive and curative health services. UNRWA operated mainly PHC services and serves those Palestinians and their descendants, who were displaced in the war of 1948. Nongovernmental organizations operated 26.5% of all PHC centers and 31.1% of hospital (WHO, 2011a).

1.6.5 Primary Health Care Centers (PHC)

Primary health care system (PHC) is a major component of the Palestinian health care system. It provides health care services to all Palestinian people with focus on children and other vulnerable groups. PHC centers in Palestine provide primary and secondary health care services as well as tertiary services. PHC centers are classified from level I to level IV. They offer different kinds of health services according to the clinic level, these services include maternal and child health, care of chronic diseases, daily care, family planning, dental, mental services and other services according to center level. The MOH works with other health sectors in providing the PHC services mainly with UNRWA and NGOs sector. There are 672 PHC centers in Palestine. In GS there are 54 MOH primary health care centers (PHC), 29 of them provide vaccination services, 2 centers out of the 29 PHC centers were completely destroyed and now they are under reconstruction. UNRWA is the second primary health care provider in the GS that plays an important role in health services delivery, providing free of charge PHC and purchasing secondary and tertiary services for the registered Palestinian refugees. The mandate of its health program is to protect, preserve and promote the health status of Palestinian refugees within the agency's five areas of operation (Jordan, Lebanon, Syria, Gaza strip and West bank) through 143 PHC centers, UNRWA operates 53 PHC centers in Palestine, 21 PHC centers are found in refugee camps of GS. UNRW has begun the health reform in October 2011 by adopting the family health team approach and e-health in June 2012 as the core strategy of the reform to strengthen primary health care. Family health team is a family centered, continuous and comprehensive primary health care delivery, focusing not only on curative care, but also on promotion of health and healthy lifestyle. E-health is composed of electronic medical records developed by UNRWA to improve patients' data management and the improvement of the overall health services. The NGO sector operates 178 PHC centers and general centers in Palestine, 57 of them in GS. The health services are distributed throughout Palestine. In addition, MOH provides a number of specific health programs such as: health education community involves community health, immunization, and school health programmes (MOH, 2013).

1.7 Operational Definitions

Healthcare Injection

It defined as a procedure that introduces a substance into the body through a piercing of the skin or a mucosal membrane for the purposes of curative or preventive health care, whether administered in a formal healthcare facilities (for example, a clinic or hospital) or other facilities (such as homes or pharmacies) (WHO, 2010a).

Safety Injection

A safe injection is defined as an injection that does not harm the recipient, does not expose the health workers to any avoidable risk and does not result in waste that is dangerous for the community (WHO, 2011a).

Reuse of Injection Equipment in the Absence of Sterilization

Reuse of injection will be defined as an equipment in the absence of sterilization as the administering of an injection to a recipient with a syringe or a needle that previously used, or reused in the absence of sterilization (WHO, 2011b).

Sharps

Sharps are defined as anything that could cause a cut or puncture leading to wound, like needles, syringes, scalpels, knives, broken glass, etc. form part of sharp wastes (Felicia et al. 2008).

Infections Wastes

Infections wastes are defined as waste that contains pathogens in sufficient construction or quantity that when exposure to it can result in diseases, e.g. waste from surgeries with infectious diseases, contaminated plastic items, etc (Kaseva and Mato, 1999).

Needle Sticks Injury

Needle stick injury is defined as an accidental puncture of the skin with an unsterilized instrument as a syringe (WHO, 2010b).

Chapter II

Literature Review

This chapter illustrates the study conceptual framework and describes the most common factors, (independent factors) background of characteristics of respondents, characteristics of facilities, competence in injection safety practice, availability of logistics and supplies, availability of waste disposal facilities and system and existence of management systems. Then a comprehensive review of the literature study is presented regarding injection safety practices that included safety to recipient, patients and community.

2.1 Conceptual Framework

Implementation of injection safety policy in each health facility focuses on the provision of quality and safe injections and safe disposal of the injection wastes [Figure 2.1]. Good injection safety practice guarantees safety and avoided risks to the provider, the recipient or the client and the community. The recipient can expose to injection high risks in case of reusing inadequately sterile syringes or needles, contamination of equipment or improper reconstitution preparation during injection preparation, or exposure to used sharps within health care settings. Also in health care facilities, injection providers and waste management personnel are the occupational categories are exposed to the highest risk of accidents with used sharps. For injection providers this risk can occur during the action of injection provision or later if used sharps are not adequately disposed of leading to needle sticks injuries. The community can be exposed to risk when used sharps waste is not disposed properly in the environment where waste pickers and other people can be pricked and infected. A good injection practice in health facilities is a reflection of adequate resource allocation, adequate supportive supervision and proper technical support.

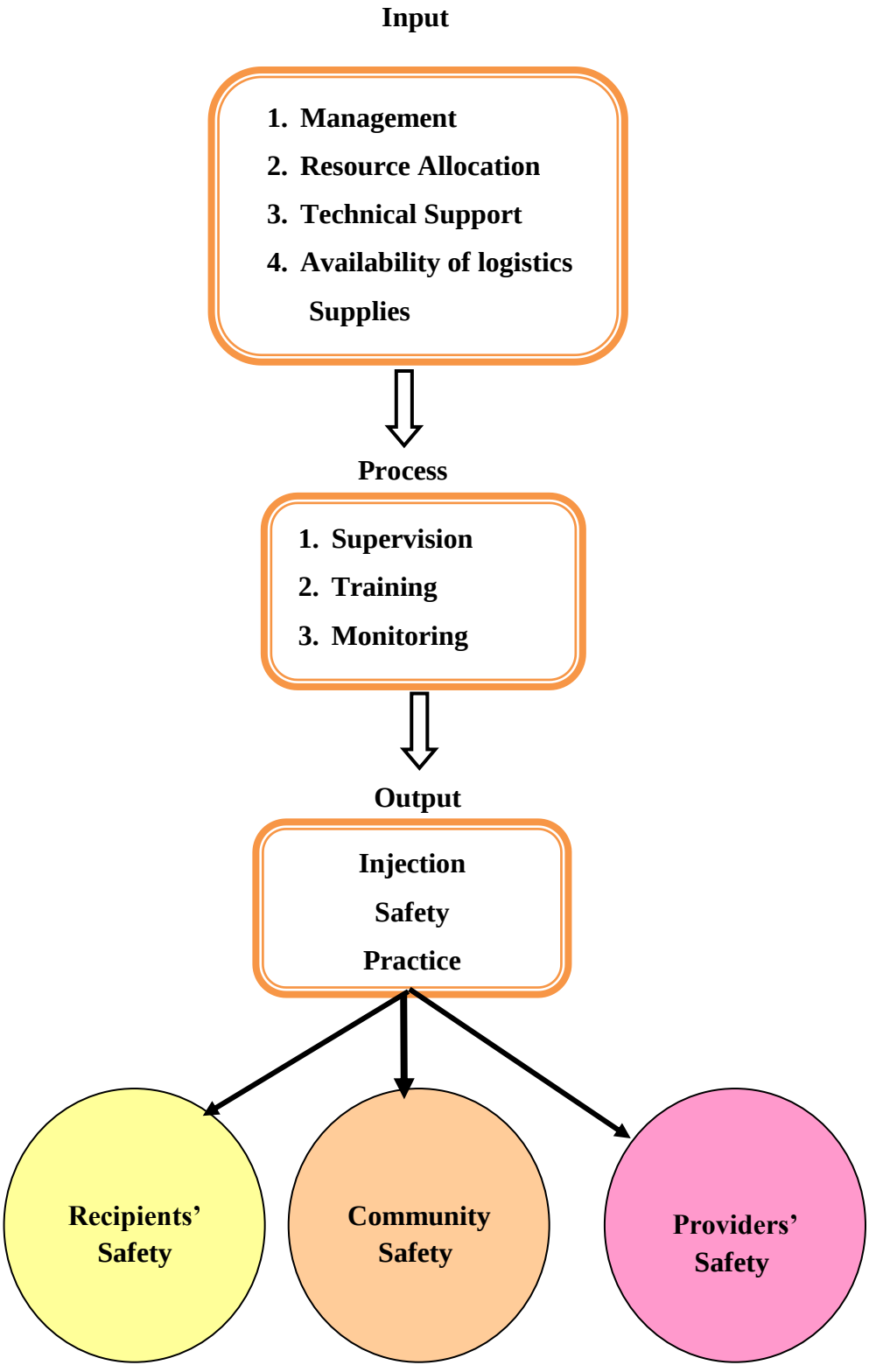


Figure 2.1: Conceptual Framework

The researcher prepared the conceptual framework based on literature review and personal experience in PHC field. The frame helped for assessment the injection safety practices and management systems which included the following elements as shown in Figure 2.1

2.1.1 Input

The logistics management system should be strengthened to ensure sustained availability of supplies and equipment for injection safety and waste management. Appropriate resource mobilization and allocation by all health care institutions must ensure that all the components of the injection safety and medical waste management are effectively implemented.

2.1.2 Process

Supportive supervision, monitoring and evaluation are the key components of the implementation of injection safety at all levels. Strengthening the necessary human resource capacities through training and sensitization on injection safety, communication strategies and materials will be identified at every level to reduce unnecessary injections at health care facilities and within the community.

2.1.3 Output

Injection safety practice guarantees safety and avoidable risks to the provider, the recipient and the community as a whole.

- **Recipients' Safety**

The risk of harming recipient can be avoided by administering useful injection (right medication) with a new sterile single use device, and observing proper technique by qualified and well trained health workers (WHO, 2008). To ensure safety to the recipient there should be a sufficient supply of quality single use devices throughout the year (Mantel et al., 2007).

Druker E, (2001), Kermode M, (2005) and Mantel C, (2007) founded many interventions for improving injection safety that have been developed focusing mostly on the formal sector, attempts should also be taken to include other sectors for better results. If interventions are carried out only in the formal sector, people may visit untrained providers from other sectors and be exposed to a greater risk. This makes the implementation of the safe injection policy challenging (Reeler, 2000). Increasing the awareness of the people

about the injection safety has also to be consideration while planning and implementing injection policy.

- **Provider's Safety**

The injection provider can reduce avoidable risks by disposing used syringe in a puncture proof closed container immediately after use without recapping. Needle stick injury (NSI) is commonly encountered by the provider especially during recapping. Khurram M, (2012) described thirty infectious diseases may be transmitted by NSI but chances of acquiring hepatitis B infection are much higher than other infections. Full immunization against Hepatitis B is important to ensure safety of the health provider according to WHO (2008).These interventions can provide protection for the healthcare workers from occupational infection with BBVDs.

The safety of the provider is a primary importance in developing countries because the protected healthcare workers are confident and encouraged to practice safe injections. They may also discriminate less against patients suffering from HIV/AIDS. Unfortunately less number of the health care workers in developing countries, are vaccinated against Hepatitis B (Khurram et al., 2012) and they work in adverse conditions where the chance of exposure to BBVDs is very high compared to developed countries (Michelle K, 2004).Furthermore, Khurram M, (2012) described the some of the unsafe practice is under reported due to the work overload. Health workers are aware about safe practices but they are unable to reflect this into practice, one of the important reasons for being the heaviest work load (Michelle, 2004; Chowdhury et al., 2011).

- **Safety of the Community**

The safe collection and disposal of used sharps (needles, syringes with fixed needles) are an integral part of the life cycle of injection device. The collection of sharps waste should be got rid in safety boxes immediately. Doing such things help in protecting health care workers and the general public from needle stick injuries.

Simonsen L, (1999) described in developing countries showed that almost half of all injectable are disposed unsafely, while kermode M, (2005) and Riaz H, (2012) described medical waste which was disposed unsafely without a proper segregation along with household trash. In addition, the disposal of the used injection equipment without a proper destruction leaves them vulnerable for scavenging and resale (Drucker et al., 2001; Bhattarai, 2000).

2.2 History of Injection

Syringe was invented in the year 1848(Drucker et al., 2001). Alexander Wood (1853) introduced hollow needle to deliver opioids (Brokensha, 1999). Within few years, syringe became a very valuable medical instrument to inject a number of drugs. In the early nineteen century, handmade syringe of glass and metal were available at a very high cost (approximately 50 $). The popularity of the syringe increased as it was used to inject penicillhin. As the demand and use of the syringe increased, mass production of syringes led to a decrease in the price. Due to continuous development in technology during 1950-60, the sterilizable glass syringe was replaced by the disposable syringe (Drucker et al., 2001).

Simonsen L, (1999) described in the early twentieth century, safe injection initiatives began in the developed countries when it was proved that non-sterile injections transmitted a pathogen that caused jaundice. The safe injection initiatives have been very effective in developed countries, but have not received the required attention in developing countries. At same time, an observed unsafe injection practices can transmit Hepatitis B, Hepatitis C, Human immunodeficiency virus (HIV) and other blood borne pathogens have resulted in substantial burden of preventable blood borne viral diseases (BBVDs).

The unnecessary and unsafe use of injections drew increasing concern among international agencies such as the World Health Organization (WHO) and national health officials and policy makers, doctors and other health workers to develop collaboration between worldwide organizations and individuals sharing a common interest. To ensure the safe and appropriate use of injection worldwide, in 1999, WHO established an international alliance, the "Safe Injection Global Network" (SIGN) has assembled major stakeholders in order to promote and sustain injection safety worldwide. In addition to best practices recommendations on the safe and appropriate use of injections, the network also provides advice to countries on waste management, health care worker safety, and cost effectiveness for injection devices (WHO, 2012a).

2.3 Safe Injection Global Network (SIGN)

Recognizing the need for a multidisciplinary approach, the Safe Injection Global Network (SIGN) was set as a voluntary coalition of stakeholders sharing a common interest in the safe and appropriate use of injections throughout the world. Associates of the network include a diversity of members which collaborate within SIGN to exchange information, advocate better practices, and develop a common strategic framework. These members

include: international organizations, non-governmental organizations, governments, universities, healthcare workers, students, consumer organizations, and industry. The SIGN strategic framework has two broad objectives. The first objective, "Innovation in Approaches" SIGN associates aim to implement pilot interventions targeted at the safe and appropriate use of injections and to introduce newer technologies that support best practices of injections. For example, the auto-disable syringe campaign has been an important tool for promoting injection safety; the reuse prevention feature offers the highest level of safety for patients and HCWs since they can only be used once. The second objective, "Achieving Safe and Appropriate Use of Injections" SIGN aims to influence national policies for the safe and appropriate use of injections and also to promote donor-funded services for injection safety in all areas of concern including waste management. In addetion, this includes SIGN assessments of injection frequencies and safety precautions around the world. The network recognizes the need to evaluate all preventive activities and to take initiatives to achieve cost-effective safe and appropriate injection practices. At the country level, SIGN has created strategies as to ensure the safe and appropriate use of injections based on country ownership, health authority ownership, and monitoring and evaluation. By helping identify gaps and actions needed based on country's requests, the network has been able to help develop national policies and strengthen Nation Regulatory Authority (NRA) for injection devices and sharps container quality control. Furthermore, SIGN promotes a three-part technical strategy for achieving necessary improvements in injection practices. These include: changing the behavior among patients and HCWs, ensuring availability of equipment and supplies, and safely managing sharps waste. Based on these components, intervention strategies have been shown to have a positive effect on improved infection safety in various regions of the world (WHO, 1999).

2.4 Safe Injection Policies

Governments have the primary responsibility for ensuring the safety of the injection processes. Policies are needed to address the following key issues; reduction of total number of unnecessary injections, promotion of safe injection practices, provision of sufficient quantities of appropriate injection equipment and infection control supplies and management of sharp waste. Against the above comes with a budget that can meet needles and syringes, safety boxes, training, incinerator equipment and spare parts, fuel for incinerators, Sterilizing equipment and spare parts (WHO, 2011a).

2.5 Injection Safety Assessment

Injection safety assessment includes: competence of the staff on injection practice, the availability of injection equipment, logistics and supplies, injection waste disposal system of the facilities, the availability of injection safety and waste disposal plans and systems.

Injection equipment that can be used to administer inject able vaccines and other medicines include: auto-disable syringes, standard disposable syringes, pre-filled and single dose no reusable devices.

2.6 Unsafe Injection Practices

Drucker E, (2001) & Brokensha G, (1999) described injection as a powerful tool to heal disease especially in developing countries. While Reeler AV, (1994) said patients are pleased and may feel that they have obtained the best care when they administer injections.

These unsafe practices rarely occur in high-income countries, but are often evident in low-income country health facilities. In high-income countries, therapeutic injections are nearly always given by trained allopathic health care providers in health facilities. In contrast, the administration of injections in low-income countries takes place in a variety of facilities, and involves range of providers. These settings are summarized below:

Formal: included doctors, nurses and other health workers.

Informal: includes untrained providers as quacks.

Traditional: healers are often trained by apprenticeship to other healers.

Domestic: injections are administered in home.

Simonsen L, (1999) described a large percentage of injections in developing countries are provided by the informal sector.

In reports of WHO, (2011b) and WHO, (2012a) described an injection to be safe if it does not harm the recipient, does not expose the provider to avoidable risk, and does not result in wastes that is dangerous for the community. This is achieved by administering the injection using a sterile device (syringe, needle), adopting sterile technique by a qualified and well trained person and discarding the used devices in safety boxes specially designed for appropriate disposal. Any breach in this process makes the injection unsafe. Drucker E, (2001), Bhattarai MD, (2000) and Simonsen L, (1999) founded reuse of contaminated syringe and unsafe disposal are very common in developing countries.

2.7 Factors Contributing to Unsafe Injection Practices:-

The reasons for unsafe injection practices in low-income countries are complex and involve a combination of socio-cultural, economic and structural factors.

Wyatt H.V, (1993) and Reeler A, (2000) founded in many low-income countries there is a perception that injections are superior (more efficacious and faster acting) to oral medication. Health workers believe that patients want injections as part of the consultation (which may or may not be true) so they provide one, even though it may not be the most appropriate treatment option. As Sciortino point out, a lack of communication between patients and health care providers may be unnecessarily contributing to unsafe of injections. Health workers give injections because they think that patients want them and patients want injections because the health workers give them. The fact that health workers always give injections and patients are passive receivers, hardly ever refuse them nourishes their mutual expectations. Possible doubts by patients or health workers are not expressed in their daily communication. It is this vicious circle which keeps the practice going. (Sciortino, 1993). Hutin (2003) described in each year some 16, 000, 000 million injections are given in developing and transitional countries. The vast majority (95%) are given for curative care. In certain regions of the world, injections are used far more than really needed, and it is not based on rational medical practice in some cases, as many as 9 out of 10 patients presenting to a primary health care provider in developing countries, receive an injection of which over 70% are unnecessary or could be given in an oral formulation (Simonsen, 1999).

Health workers in low-income countries can be professionally and geographically isolated, making it difficult for them to learn about safe injection practices. Access to educational resources and opportunities for ongoing professional development is often limited. In addition, the health structures required to be effectively implemented, monitor and evaluate changes in practice do not always exist.

(Wyatt, 1986; Reeler, 2000 and Bhattarai, 2000) founded in many low-income countries to buy a range of injectable medications over the counter or on the black market, which are injected by relatives, friends or informal health care providers (e.g. ‘injection doctors’ in market places) using unsterile injecting equipment that is frequently used for more than one patient. Practices such as these facilitate the use of inappropriate medications purchased without medical consultation, administered by untrained personnel, using needles and syringes that are unlikely to be adequately cleaned or sterilized between users.

Study in Bungling district conducted by Gyawali in 2013 among 58 primary health care centers in western Nepal, which that founded most injection providers (90%) reported that none of them had been sent for training on safe injection practice in the last two years. A training solely dedicated to injection safety is needed to bring about positive changes in their attitude regarding safe injection practice. A health safety wing within the department of health services, MOH and a regular curriculum in health safety and health waste disposal for the primary health care worker is needed (Gyawali et al., 2013). The limited availability of financial resources in low-income country health settings affects their capacity to purchase and maintain an adequate supply of appropriate injecting equipment. Additionally, a lack of financial resources is often coupled with the complex issue of corruption, which means that money allocated for health care may not always be used for its intended purpose, and systems put in place to ensure patient and health worker safety can be easily subverted. Certain structures are common to most health settings in high-income countries (infection-control committees, quality assurance systems, occupational safety standards, patient's rights) facilitate the implementation, monitoring and evaluation of elaborate systems of infection control, including injection safety. These structural advantages are not routinely a feature of health settings in low-income countries. Other environmental factors necessary for injection safety include an adequate and reliable supply of water and electricity, and these are not always available in remote areas of most low-income countries.

2.8 Burden of Disease Caused by Unsafe Injection

Put simply, “a safe injection does not harm the recipient, the health care worker, or the community” (WHO, 2012b). This is in accordance to the first fundamental medical principle “first does no harm” however; recent surveys have shown that a very high percentage of injections are unsafe. But it is not just the patient whom is in risk. Transmission of disease can occur from patient to health worker, from health worker to patient, and also to the community at large. In 1999, UNICEF, UNFPA, and the WHO made a statement asking all countries to only use auto-disable (AD) syringes for immunization by 2003 (WHO, 1999). The common agreement to phase out sterilizable syringes was due to the high risks associated with sterilization and the diminishing costs of AD syringes. Although ideally AD syringes should be used under all surroundings, to prescribe such a recommendation would not take into consideration the significant lack of resources in many countries and the importance of discouraging the overuse of injections.

For example, while the cost difference of AD syringes versus sterilizable syringes is almost null (0.04 $), habits of recycling have been ingrained in many cultures as to “save” money but in reality the burden of disease associated with unsafe practices is much more costly. In 2005, a West African survey of 1241 healthcare workers (HCWs) found that approximately 567 individuals (45.7%) had accidentally been exposed to blood in the previous year (80.1% due to percutaneous injury) (Tarantola, 2005). Unsafe injections include a wide-range of practices that directly expose individuals in danger. Whereas the reuse of equipment present direct risks to patients, HCWs and the community are frequently exposed to needle stick injuries. Globally, healthcare workers incur 2 million needle stick injuries per year that cause infections with hepatitis B and C and HIV (Wilburn, 2004).These risks occur when there are lapses in proper infection controls. Of particular concern has been the transmission of blood borne pathogens including HBV, HCV, and HIV all of which can lead to more severe consequences such as disability and death in the years following contamination (Hauri, 2004). Mahfouz and others described in their study conducted in south-western Saudi Arabia in 2009, about 15% of PHC physicians and nurses had experienced needle stick injuries in the previous year, giving rates of 0.21 and 0.38 needle stick injuries per person per year respectively, and 85% of health providers in PHCCS in Abha district recognized the possibility of injection-associated transmission of all the 3 important diseases (HIV, hepatitis B and C) (Mahfouz et al., 2009).

The contribution made by unsafe injection practices to the transmission of BBVs in low-income countries has been slow to emerge. Most infections caused by unsafe injections are likely to go unnoticed because they are rarely associated with symptoms at the time of infection, or the symptoms are rather non-specific. The long incubation period between the time of infection and the development of disease (such as liver cirrhosis, liver cancer and AIDS) means that the connection between the disease and an injection had given months or years earlier is unlikely to be made, especially when injections are such common place events in people's lives. This problem is compounded by a lack of disease surveillance in many low-income countries (Simonsen et al., 1999).

Kane in (1999) described the number of HBV, HCV and HIV infections attributable to unsafe injection practices (defined as the re-use of a syringe or needle from patient to patient without sterilization) in low-income countries has been calculated as 8–16 million HBV, 2.3–4.7 million HCV and 800, 00–160, 000 HIV infections globally every year.

Hepatitis B Virus: particularly dangerous for new-borns who have a 90% risk of developing chronic HBV (which can lead to liver cirrhosis or liver cancer) if infected. It is estimated that unsafe injection practices account for 21 million HBV infections annually (33% of new HBV infections worldwide).

Hepatitis C Virus: without any vaccines to prevent HCV, the danger of infection is presenting for all age groups. Approximately 75-85% of people infected will develop chronic HCV (CDC, 2010). Unsafe injections are the leading cause of HCV infection causing 2 million new infections each year (42% of new HCV infections worldwide).

HIV/AIDS: it is estimated that in 2009, 1.8 million people died as a result of AIDS and 2.6 million people were newly infected with the virus (WHO, 2011a). Recently, 260, 000 (2%) of infected people were caused by unsafe injections.

This research purposes to assess injection safety in GS, analyze the survey data and make recommendations on how injection safety could be improved.

2.9 Misconceptions about the Reuse of Equipment

Many numbers of HCWs do not follow the necessary precautions and procedures when working with injection equipment. Despite the fact that the cost average of an AD syringe is 0.05 $ (WHO, 2002), the reuse of equipment remains an issue needs further discussion. While insufficient resources in certain regions have forced healthcare facilities to more carefully monitor stock, misconceptions on injection reuse have also put millions of individuals in the risk of infection all over the world. Reuse usually occurs when HCWs mistakenly believe that it is safe to reuse the syringe after changing the needle, that it safe to re-enter a multi-dose vial or saline bag with a used needle or syringe, or that a bag or bottle of intravenous solution can be used multiple times (WHO, 2009). Internationally, increased awareness on the dangers of unsafe injections is required. In a survey of clinician practices in US healthcare settings in 2010, 5,446 individuals were asked questions concerning injection practices. 45 (0.9%) of analyzed individuals said that they "sometimes or always" administered medication to more than one patient using the same syringe but a new sterile needle for each patient; 318 (6.0%) individuals claimed to "sometimes or always" using single-dose/single-use vials for more than one patient, and; 797 (15.1%) individuals "sometimes or always" reused a syringe to obtain additional doses from the same multi-dose vial for the same patient of which 51 (6.5%) individuals saved the vial for use on another patient (Pugliese, 2010). In a study conducted by Enwere &

Diwe in 2014 about knowledge, perception and practice of injection safety and healthcare waste management in south east Nigeria, which appeared (82.9%) of HCWs were used disposable syringes and needles for one time only (Enwere & Diwe, 2014). The Centre for Disease Control and US public officials estimate that from 1998 to 2009 there were 51 outbreaks of HBV and HCV infections associated with the misuse of injection equipment of which 620 of 75,000 exposed patients became infected or died from either disease (Pennsylvania Patient Safety Authority, 2011).

Any one can imagine that in developing countries, misconceptions about administering safe injections are more predominant. In a survey of injection practices in Cameroon, 44% of the population sample reported some forms of unsafe injection equipment reuse. In particular, 39% of the sample self-reported routinely reusing either the needle or the syringe on another patient whereas 2% reported reusing a needle and syringe on another patient (Okwen, 2011). In developing countries, the lack of training and insufficient injection equipment feed into the vicious cycle of unsafe injection practices; even if health workers are enthusiastic to adopt best practices as defined by the WHO, the lack of funding and other pressures influence their decisions to continue misusing and reusing injection equipment.

2.10 Misconceptions Leading to Injection

2.10.1 Community Pressures

There is a common misconception that injections are more effective and act faster than oral medication. The pain of injections is often confused as a sign of efficacy, however, in most cases oral alternatives have proven to not only be safer but also more effective and less costly. This culture and attitude towards demanding injections is particularly true in South East Asia and the Middle East, where on average each person receives between 1.2 (in Tanzania and India) and 8.5 (Pakistan—in some regions it is as high as 13.6) injections per year (Kermode, 2004). Although this popularity of injections increases the risk of unsafe practices, this kind of trust in injections has also led to the success of epidemic control programmers. On the other hand, immunization injections represent less than one-tenth of the global total number of injections (Miller**,** 1999).

Societal pressures are often formed based on false information about injection safety. According to an interview conducted by the WHO in rural village in Thailand, most individuals surveyed denied that there were any risks associated with injections (Reeler, 2000). The commonly held belief about injections was that one ampoule equaled 10 pills.

Such community misconceptions place excessive pressures on community health workers and also make it difficult to eradicate popular beliefs about injections. While the solution to ensure best practices in communities lies solely with health care providers, altering demand means educating individuals within the community as well.

2.10.2 Health Care Worker Pressures

Apart from the fact that many injections are unsafe, most injections are also unnecessary. In the developing world common symptoms treated with injections include: fever, upper respiratory infections, colds, ear infections, tonsillitis, pneumonia, and diarrhea (Reeler, 2000), all of which have oral alternatives. Limited access to educational resources in low-income countries contributes to injection overuse, but HCWs faces two other negative pressures to provide patients with injections. On the other hand, primary health cares clinics (especially in rural areas) are encouraged to continue bringing in patients in order to a direct observe therapy progress and compliance with treatment regimens. Thus if patients demand injections, it is difficult for HCWs to turn them away because it is possible that they will seek medical advice in another place. A study in Cambodia found that only 13% of injections were administered in public hospitals (Vong, 2005). The problem with this that it is difficult to control for the standards of hygiene and proper medical procedures in these alternative health clinics Secondly, injections often involve an extra fee which is incentive enough for most health care providers. In Pakistan, Janun N, (2005) described in a survey that was conducted in Sindh province indicated that private health workers were substantially over prescribing injections to the population. With an estimated 13.6 annual injections per person, the ratios of injection per capita were among the highest ever reported. Additionally, it was revealed that the fee average charged for receiving an injection was approximately US $0.8 despite the relatively low price of single-use syringes in the market (0.03$). Such economic incentives and patient preference for injections thus decrease efforts to improve injection safety. Furthermore, the issue has been further exploited by the fact that many rural health care clinics are continuously repackaging used syringes as to seek a higher profit margin.

2.11 Medical and Health-Care Waste

Medical and health-care wastes have sharply increased in recent decades due to the increased population, number, and size of health care facilities, as well as the use of disposable medical products (Mohee, 2005). According to the United States Environmental

Protection Agency (USEPA) medical wastes contain all waste materials generated by health-care facilities, such as hospitals, clinics, physician's offices, dental practices, blood banks, and veterinary hospitals/clinics, as well as at medical research facilities and laboratories (USEPA, 2016), that can include a wide range of materials, such as used needles and syringes, soiled dressings, body parts, diagnostic samples, blood, chemicals, pharmaceuticals, medical devices and radioactive materials (Ananth et al., 2010) . Where it is now commonly recognized that certain types of medical waste are among the most hazardous and potentially dangerous of emerging wastes across many communities (Bdour et al., 2006) where medical waste can be classified into two major groups: general and hazardous waste (Taghipour and Mosaferi, 2009). According to World Health Organization in November 2015:

1. 85% of the total amount of health-care activities generated waste is general, non-hazardous waste.
2. The remaining 15% is considered hazardous material that may be infectious, toxic or radioactive.
3. Every year an estimated 16 billion injections are administered worldwide, but not all of the needles and syringes are properly disposed of afterwards.
4. Health-care waste potentially contains harmful microorganisms, which can infect hospital patients, health workers and the general public.
5. Health-care waste in some circumstances is incinerated, and dioxins, furans and other toxic air pollutants may be produced as emissions (WHO, 2015a).

Improper waste management can lead to environmental pollution (water, air, soil…..), unpleasant smells can foster the growth and multiplication of insects, rodents, and worms, and may lead to transmission of diseases like typhoid, cholera, human immunodeficiency virus (HIV), and hepatitis (B and C) (Abdulla et al., 2008). Exposure to medical waste can cause a disease or injury, were the risk of sharps injury and bloodstained body fluids BBF exposure appeared high in medical waste hospitals (MWHs) (Shiferaw et al., 2012) . The UK reported 40 incidents of sharps injuries associated with medical waste handling (Franka et al., 2009), in developed countries have shown that occupational exposure to waste may result in HBV infection (Dounias et al., 2005).

2.11.1 Health Risks of Medical Waste

Health-care waste contains potentially harmful microorganisms which can infect PHC patients, health workers and the general public. Other potential infectious risks may

include the spread of drug-resistant microorganisms from health facilities into the environment.

Health risks associated with waste and by-products it also includes:

1. Radiation burns.
2. Sharps-inflicted injuries.
3. Poisoning and pollution through the release of pharmaceutical products, in particular, antibiotics and cytotoxic drugs.
4. Poisoning and pollution through waste water; and by toxic elements or compounds such as mercury or dioxins that are released during incineration (WHO, 2015b).

As Enwere & Diwe point out, risks and hazards associated with healthcare waste include: needle stick injuries transmission of infections or diseases, re-use of some types of waste (accidental or intentional), environmental pollution or degradation, exposure to radiation, fires and public nuisance (Offensive smells, unsightly debris). 80% of healthcare waste is general waste or low risk waste, 20% can be dangerous and referred to as risk waste while 1% of risk waste is sharps waste (Enwere & Diwe, 2014).

2.11.2 Sharps-Related

An estimation of 16 billion injections are administered every year worldwide. Not all needles and syringes are disposed safely, creating a risk of injury, infection and opportunities for reuse.

Injections with contaminated needles and syringes in low- and middle-income countries have reduced substantially in recent years, partly due to efforts to reduce the reuse of injection devices. Despite this progress, in 2010, unsafe injections were still responsible for 33, 800 new HIV infections, 1.7 million hepatitis B infections and 315 000 hepatitis C infections (Pepine et al., 2014).

Additional hazards occur from scavenging at waste disposal sites and during the manual sorting of hazardous waste from health-care facilities. These practices are common in many regions of the world, especially in low- and middle-income countries. The waste handlers are at immediate risk of needle-stick injuries and exposure to toxic or infectious materials.

2.11.3 Environmental Impact of Medical Waste

Treatment and disposal of healthcare waste may pose health risks indirectly through the release of pathogens and toxic pollutants into the environment.

1. Landfills can contaminate drinking water if they are not properly constructed. Functional risks exist at disposal facilities that are not well designed, run or maintained.
2. Incineration of waste has been widely practiced, but inadequate incineration or the incineration of unsuitable materials results in the release of pollutants into the air and of ash residue. Incinerated materials containing chlorine can generate dioxins and furans, which are human carcinogens and have been associated with a range of adverse health effects. Incineration of heavy metals or materials with high metal content (in particular lead, mercury and cadmium) can lead to the spread of toxic metals in the environment.
3. Only modern incinerators operating at 850-1100 °C and fitted with special gas cleaning equipment are able to comply with the international emission standards for dioxins and furans.

Alternatives to incineration are now available in developed countries, such as autoclaving, microwaving, steam treatment integrated with internal mixing and chemical treatment (WHO, 2015a).

2.11.4 Unsafe Sharps Management

Lack of awareness about the health hazards is related to health-care waste, inadequate training in proper waste management, absence of waste management and disposal systems, insufficient financial and human resources and the low priority which is given to the topic are the most common problems connected with health-care waste. Many countries either do not have appropriate regulations, or do not enforce them.

Improper management and disposal of injection equipment is a common danger for HCWs and the community to contract blood borne pathogens. Wherever waste is generated, safe and reliable methods for handling are essential. However in reality, health workers in developing and transitional countries are less likely to adhere to standard precautions for sharps management. This double issue involves the collection and the disposal of sharps waste.

Safe collection of injection equipment requires the use of puncture-proof disposal containers. This limits the risk associated with recapping needles since they are disposed of immediately after use and encourages a safe working environment for healthcare providers. But the use of safety boxes in health care clinics is rarely an issue by itself. Two most common causes of needle stick injuries are two-handed recapping and the unsafe collection

and final disposal of sharps waste (WHO, 2003). For many developing countries, scarcity of resources has ingrained habits of reusing and recycling and thus an absence of sharps waste collection. Internationally, less than 10% of syringes are supplied with special safe disposal boxes (Miller, 1999). A study in sub-Saharan Africa revealed that among the injection providers who had sustained a needle stick injury, 11% reported that there was no safe container available on their latest injury while 4% reported that the nearest containers was in a different ward. Furthermore, recapping of used needles was estimated to be related to 13% of all needle stick injuries reported (Nsubuga & Jaakkola, 2005). The study showed the strongest predictor for needle stick injuries to be the lack of training. However, inadequate resources in the region have made it difficult to implement best practices. In study conducted by Ganesh, 2015 in India, which appeared the prevalence rates of exposed to needle stick injury between nurses was 25.6% (Ganesh et al., 2015). This study appeared the cause of NSI due to lack of training about injection safety and management of sharp waste.

The use of AD syringes and safety boxes greatly reduce the risk of transmission of blood borne pathogens for patients and HCWs. These methods also increase the amount of waste generated by clinics. Contaminated sharps waste is usually considered as highly hazardous healthcare waste and may create a variety of health risks to communities. More unfortunate is the fact that the issue of the disposal of sharps has been neglected in national policies throughout the world. Approximately 50% of non-industrialized countries have reported to use open burning of syringes in 2004 an unacceptable practice according to WHO procedures on safe waste management (WHO, 2000), In developing and transitional countries the major obstacle to health care waste management is the lack of financial resources.

In Karachi, Pakistan, with a population of over 10 million people and one of the highest injection rates in the world, the reuse of syringes is very common. In a study to evaluate the resale of used syringes, pathologists identified 44 clinical laboratories and interviewed 17 housekeeping employees and 26 scavengers. What was discovered was that 59% of the clinical laboratories were found to be dumping used syringes in community waste sites and subsequently putting members of the community in the risk of transmission of disease. Of those interviewed, housekeeping staff reported zero to five needle stick injuries per week (Mujeeb, 2003). The enforcement of waste management programs in such regions is essential in order to disband the resale of injection equipment.

2.11.5 Management of Sharps Waste:

The management of health-care waste requires an increased attention and diligence to avoid the substantial disease burden associated with poor practice, including exposure to infectious agents and toxic substances.

Key elements in improving health-care waste management are:

1. Building a comprehensive system, addressing responsibilities, resource allocation, handling and disposal.
2. A raising awareness of risks related to health-care waste, and safe practices.
3. Selecting safe and environmentally-friendly management options, to protect people from hazards when collecting, handling, storing, transporting, treating or disposing the waste.

Government commitment and support is needed for universal, long-term improvement, although immediate action can be taken locally

As the use of Auto destruct syringes increased, so the need for all injection supplies has to be disposed properly. Used syringes and other injection waste are not dumped in open places where people might step on or come in contact with them in any other way. Disposal of sharps could take the forms of disposal of the whole syringe with needle attached; the whole syringe with needle attached is dropped in a safety box for onward incineration. Separations of needles from plastic syringes, the needles are removed from the syringe with a simple device with a receptacle that receives the needles. The needles are either encapsulated and buried in a protected burial in an onsite pit or disposed off in a sharp pit. The syringes are either shredded before burial in an onsite pit or they are treated with 0.5% chlorine solution for 30 minutes or boiled for 20 minutes and then offsite disposal or recycled. The need to manage contaminated sharps has prompted the development of tools to assist countries with planning and policy development. These tools include an assessment tool for health care waste management that examines current practices. Level of awareness of risks and the country regulatory framework is to provide essential information for designing an action plan.

2.11.6 Safety Boxes:

Safety boxes or sharp containers are puncture-resistant containers into which Auto destruct syringes and needles are placed immediately after use temporarily stored until they can be destroyed. They should be supplied in sufficient quantity such that they are always within reach of a vaccinator, even during outreach sessions.

Approximately 100 2ml syringes and needles fill 5 liters safety box. 5ml and 10 ml syringes take up more space therefore fill 20 liters safety box. Waste disposal and destruction filled safety boxes are supposed to be incinerated. If an incinerated is not available, a much less desirable but effective alternative is to use kerosene to burn them. In planning waste disposal in a health facility, managers should consult medical waste policies and environmental regulations for the national and local levels. The plans must include; Location of disposal facilities, Disposal of filled safety boxes, Schedule and budget for destruction of safety boxes, Logistics, Training and Incineration equipment (Immunization essentials Report, 2003).

In the study conducted by Eljedi (2014) in the Gaza Strip evaluating the compliance of HCWs with the Palestinian IPC Protocol and assessing ways in which the implementation of the Protocol could be facilitated. The findings revealed that the most important reasons for non-compliance with the IPC Protocol were the absence of education or training programmes (61.5%), lack of knowledge (52.4%) and the scarcity of the required supplies (46.9%). Only 2.3% of respondents had a copy of the national IPC Protocol, while 65.8% did not know of its existence. Only 16.9% of respondents had participated in training sessions about general IPC procedures while 66.1% had been exposed to an injury from used needles. The observation checklist revealed a lower level of compliance in all infection control practices than was perceived by the HCWs in self-administered questionnaires. Nurses were more compliant to the most of IPC practices than other groups of HCWs. Observations of the health facility environment indicated a lack of certain essential equipment and materials, such as covered waste containers and heavy-duty gloves (Eljedi et al., 2014).

In Palestine the current system of medical waste management (including collection, separation, transportation and disposal) is under development and is in urgent need of immediate attention and improvement. Improper practice is evident from the point of waste production to final disposal. The separation of medical waste into the appropriate waste categories is incomplete in PHCCs. There is much concern for the lack of correct waste management practices adopted for hazardous waste. Of these, there is a general trend to handle sharps more carefully than other waste materials by most HCWs, who separate them in special boxes.

Chapter III
Methodology

This chapter will address issues related to methodologies used to answer the research objectives. The chapter commences with study design, study population, study setting, period of the study, sample size, and sampling. It presents construction of the questionnaire, piloting, ethical consideration, data collection and data analysis.

3.1 Study Design

The design of this study is a mixed-methods one, in which data has been triangulated (quantitative and qualitative). This study is a descriptive analytical cross-sectional one. This design was used to assess the injection safety practices and management in primary health care centers in Gaza Governorates. Cross sectional design reflects the existing facts at the same point of data collection time. In this study, methodological triangulation would provide combination between quantitative (self administered questionnaire with health providers) and qualitative paradigms (observation checklist in PHCCs and in depth interview with key informants in MOH and UNRWA).

3.2 Study Setting

GS composed of main five governorates which are North Gaza, Middle Zone, Khan Younis and Rafah Governorates. Rafah and Khan Younis are in the south. This study was conducted in UNRWA and MOH PHC centers at five Gaza governorates according to the geographical distribution of people.

3.3 Study Population

The target population consists of all health care who is working in PHC centers at MOH and UNRWA in the Gaza Governorates at the time of the study. There were 75 PHC centers, 21 in UNRWA and 54 in MOH. The study population was selected from health care providers work in UNRWA and governmental PHC centers of different governorates in GS. Study population was around 1800 health care providers in PHCCs in GS (1016 in PHCCs in UNRWA 784 in PHCCs in MOH).

3.4 Eligibility criteria

3.4.1 Inclusion criteria for health providers

- Fixed term health providers who are working in PHCCs in MOH and UNRWA.

3.4.2 Exclusion criteria for health providers

- The health providers who are working in PHCCs in NGOs and private sectors

3.5 Period of the study

The study took 11 month in execution; it started in November, 2015 and completed by October 2016. This study was initially proposed in November, 2015. The research proposal has been submitted to and defended in the front of SOPH assigned committee in December 2015. At its development, the research proposal described the entire process and provided information and design of the data collection and data analysis methods and tools. Upon the approval, the researcher prepared the required tools of his study in addition to the demographic question. The researcher has consulted a group of 10 experts at arbitration stage before the finalization of the tool. The arbitration stage lasted for two weeks including refining of tools in the light of reviewers and the academic supervisor's feedback. In March 2016, the tool was ready to go for data collection. Piloting took place between 2 and 6 March 2016. Actual data collection started on 15 March through 28 April 2016. The researcher identified daily work hours to start at 08.00 am through 01.00 pm in order to increase the likelihood of distributing the questionnaires as many participants as possible.
Initial analysis of quantitative data was done between May and June 2016. The researcher extracted findings, created descriptive tables and performed inferential statistical analysis. After finishing quantitative part, qualitative data collection started in September 2016. The researcher stayed about 6 weeks in collection and analysis of qualitative data. Observation checklist were done first then in depth interviews. The drafted report "thesis" has been frequently enriched and edited by the research supervisor. The final draft for defense was handed on 14 November, 2016.

3.6 Sample Size and Sample Process

In order to calculate the required sample, the researcher gathering the needed data, as shown in Table 1. Each birth cohort is around 60,000 live births; the distribution of children for BCG vaccine reflected the size of work in UNRWA and Government in each Governorate. The researcher used Epi –Info program version 7 to calculate the sample size

(Annex I), number of all health care providers work in primary health care centers in GS are nearly 1800, taking the highest estimate of sample size we will consider 50% expected frequency from all injection practices to be safe in each year, with the worst estimate 45% and consider the confidence interval is 95% so the sample size was 317 health care providers. To overcome non-respondents 360 health care providers were included in the study.

The sampling of quantitative paradigm (Self-administering questionnaire) includes thirty PHCCs in GS (11 UNRWA PHCCs and 19 UNRWA PHCCs), the researcher select a cluster of 12 health professionals from each health center (medical health officer, one physician who provide well baby clinic services, 3 general physicians, head nurse, one dentist, two nurses who provide vaccination, one nurse who provides curative services and 2 lab technicians collecting blood sample in each health center) as shown in Table 1.

The sampling of qualitative paradigm (Observation checklist) is selected from pervious sample, it includes a cluster of 5 health professionals sites (dental room, injection room, vaccination unit, lab unit and the stores and the waste disposal sites. For this purpose in each Government we selected 2 clusters, one UNRWA and the other is Government with total 50 clusters.

Distribution among Gaza Governorates area was according to their representation from the total population. The representation of each center was based on the number of children who received BCG vaccine as shown in Table 1. Approximately for each 2000 BCG given we selected one center with total 30 centers.

Table 1: Sample size of quantitative paradigm (Self-administering questionnaire)

Area	Institute	BCG	Number of Health Centers	Sample Size Each Cluster = 12
North	UNRWA	6546	3	36
	MOH	2942	2	24
	TOTAL	9488	5	60
Gaza	UNRWA	12088	6	72
	MOH	9017	5	60
	TOTAL	21105	11	132
Mid	UNRWA	7634	3	36
	MOH	696	1	12
	TOTAL	8330	4	48
Khan Yonis	UNRWA	7254	4	48
	MOH	4279	2	24
	TOTAL	11533	6	72
Rafah	UNRWA	6416	3	36
	MOH	965	1	12
	TOTAL	7381	4	48
Grand Total	UNRWA	39938	19	239
	MOH	17899	11	121
	TOTAL	57837	30	360

Source: Epidemiological department in Rimal clinic

Multi-stage sampling technique was used to select primary health care centers in both UNRWA and MOH PHC facilities. First, proportional stratified cluster-sampling method was proposed as the easiest method to obtain a representative sample of health care facilities (Bennett, et al., 1991). Then, in such a cluster sampling, self-weighting is ensured through (1) choice of regions in which clusters were selected using probability proportional to population size, and (2) equal numbers of sampling units within each cluster

1- Gaza Strip by regions**:** Gaza Strip was divided into 5 governorates include (North Gaza, Gaza, Mid Gaza, Khan Yonis and Rafah).

2- Selection of governorates with a probability proportional to population size: From the whole Gaza Strip, 5 geographic regions selected with a probability proportional to population size.

3.7 Study Instruments

Three instruments were used for achieving the study objectives, including: self-administering questionnaire with health providers, in-depth- interviews with medical health officers, information system managers in both (MOH & UNRWA), and observation checklist of injection processes. I used the standardized WHO/SIGN tool (Tool C) after modified to conduct structured self-administering questionnaire and observation checklist (WHO, 2001).

1. Self-administering Questionnaire

Self-administering questionnaire was designed to health care providers in Gaza governorates aiming to examine if the health care providers comply to meet WHO standard practices during giving injection or not? if not why, to collect demographic variables, knowledge and capacity regarding of injection safety surveillance, burden of disease attributable to unsafe injection practices and the presence of guidelines and protocols related to injection safety and other relevant variables.

2. In-depth Interviews

In-depth interview was held with medical health officers and information system managers in their work places. In separate visits the researcher fills in a post- questionnaire of primary results in order to assess the existing guidelines and protocols related to injection safety and to explore possible options to improve inter and intra-sectorial cooperation and coordination in injection practices.

3. Observations Checklist

In each facility observations checklist was done at the injection rooms, blood sample collection rooms, vaccination rooms, dental rooms, the stores and the waste disposal sites.

3.8 Ethical and Administrative Consideration

1. Approval letter obtained from public health school at Al Quds University.
2. Approval letter from general directorate of MOH and UNRWA in GS (Annex 9 & Annex 10).
3. An official letter of approval to conduct the study obtained from the Helsinki Committee in the GS (Annex 8).

4. Consent forms administered to respondents before interviews and observation (Annex 3).
5. The confidentiality of the responses from the respondents assured by explaining how the information recorded and used.
6. I exercised discretion by intervening to prevent potential harm to recipient in the event of an attempt to conduct an unsafe injection practice and also I provided technical advice for instant correction.

3.9 Pilot Study

Before starting the actual data collection process, pilot study was carried out for 10 health workers outside the selected clinics prior to the beginning of data collection to check applicability, identify problems in research questionnaire that is used for data collection and measure validity and reliability. Pilot study will be used to examine the clarity and ambiguity, length and suitability of questions before the data collection process starts (Polit & Beck, 2004). During pilot study in self administering questionnaire in the question talk about guideline and protocol of injection safety, the researcher observed after asked the health providers, there is no present of guidelines in health facility but only present of circulation by MOH in health facility, therefore the researcher separates of this questions into two parts, one part asked about guideline/policy but another part asked about circulation of injection safety by MOH in health facilities.

3.10 Data Collection

Data collection is defined as the precise, systematic gathering of information related to the research purpose or specific objectives, questions, or hypothesis of the study (Burns & Grove, 2003). The researcher used the standardized WHO/SIGN tool (Tool C) after running some modifications to fit the Palestinian health context for assessing injection practice. The tool was used to conduct structured of self administering questionnaire and observation checklist.

Quantitative Part

After the pilot study, the researcher conducted the data collection, they started by distributed of the questionnaire to health providers who are working in selected MOH and UNRWA health centers and asking them to self administered. The researcher started from the health centers in north and Gaza then to middle and south area. The researcher will be

illustrated some questions that may be vague of health providers. Time collection for each questionnaire ranged between 25-30 minutes. Privacy was maintained during gathering the completed questionnaire.

Qualitative Part

The second component of the data collection was conducted after the analysis of quantitative part in September and October 2016. Observation checklist within in ten PHCCs in GS and in depth interview with six key informants in MOH and UNRWA were done. Prolonged engagement and probing techniques were used to make sure that ideas are reasonably reflected. The researcher conduct 50 Observation checklist in deferent departments in PHCCS as (the injection rooms, blood sample collection rooms, vaccination rooms, dental rooms, the stores and the waste disposal sites), and each observation checklist last around one hour, also the researcher conduct in depth interview with key informants in MOH and UNRWA, each interview last 45 minutes, the researcher recorded in depth interview to allow further capturing of information.

3.11 Reliability and Validity

3.11.1 Reliability

Reliability is referred to repeatability or how far the investigator will repeat the same measurement if the investigation are conducted more than one time. Last defined reliability as "the degree of stability exhibited when a measurement is repeated under identical condition". Reliability refers to the degree to which a measurement procedure can be replicated (Last, 1983).

The researcher considered reliability of the instruments as an important issue and tried to ensure it through filling the whole number of questionnaires, the researcher leaved clear instruction for in data collection. The same tools were used for all respondents and after data collection completion all filled forms were checked for completeness. Tool and implementation were standardized.

3.11.2 Validity

Validity refers to the degree to which a study accurately reflects or assesses the specific concept that the researcher is attempting to measure. While reliability is concerned with the accuracy of the actual measuring instrument or procedure, validity is concerned with the study's success at measuring what the researchers set out to measure.

3.11.3 Face validity

It is concerned with how a measure or procedure appears. Does it seem like a reasonable way to gain the information the researchers are attempting to obtain? Does it seem well designed? Does it seem as though it will work reliably? Unlike content validity, face validity does not depend on established theories for support (Fink, 1995). The study tools were checked for face validity when the pilot study was conducted. The researcher asked the pilot study respondents to give their opinions about the format, layout, structure and type-writing clarity of study instruments.

3.11.4 Content Validity

Content validity is defined as the extent to which a test reflects the variables it seeks to measure (Holm & Liewellyn, 1986). The questionnaire was sent by the researcher to 10 experts to assess the instrument from clarity, relevancy to the topic and holism point of view. The experts have good experience in the field of medicine, public health, management and research. The experts were asked to add any suggested modifications that will enrich the research tools. Their suggestions and comments were considered and modifications were introduced. Since instruments are used for measurement validity that is known as the degree to which an instrument measures what is supposed to measure (Polit & Beck, 2004).

3.12 Data Management

Data management is the way that the research is becoming more data intensive. The ability to make research data available for further use delivers a series of benefits including individual and institutional reputation (through data citation), better research and data validation, improved cost benefit ratios, and compliance with emerging open access agendas. Data sharing will further reduce duplication and will enable more targeted future research. It also supports complex, international research projects. Data management includes data entry and data analysis.

3.13 Data Entry and Data Analysis

After checking and reviewing all filled questionnaires on the same way data was entered computer using SPSS (Statistical Package for Social Science) software version 20 to be analyzed. After finishing the data entry process, check codes was used to avoid double entries. Pretesting of the tools were done to eliminate inconsistencies and made the

questions related to the local settings. Data cleaning was done to account for missing values in a bid to ensure integrity and reliability.

The collected data was captured and analyzed using SPSS (Statistical Package for Social Sciences) version 20. Frequencies cross tabulations and graphs were used to analyze data. First data cleaning was done to ensure that all data entered accurately and in appropriate way. Data cleaning was conducted through selecting and checking out of a random number of the filled questionnaires, and also through operating frequencies and descriptive statistics for almost all dependent and independent variables. A cross tabulation between of the socio-demographic characteristics of the respondents and their knowledge and practice of injection safety, inferential statistic to compare means between dependent and independent variables. There for we applied ANOVA test, t test, Chi Square and level of significance will be set at a P value of less than 0.05. Knowledge score depends on total "Yes" and then the total score was categorized to high and low.

3.14 Limitation of the Study

1. Observation of practice may be biased through observer-induced changes in practice.
2. Information was not readily available on the costs [amount of funds that are spent annually] of injection safety practice and waste disposal.
3. Absence of unified guideline and protocols for safe injection procedure.
4. Time limitation because of the nature of researcher work and life condition.
5. The study is not including the NGOs and the private sectors.

Chapter IV

Results and discussion

This chapter presents the main results of our based on the results collected by the self-administering questionnaire, observation checklist and In-depth interview with the key informant health professionals. In the descriptive analysis the percentage distribution provides a description of data including socio demographic characteristic, job title, years of experience, knowledge, practices and attitudes of health care providers to injection safety. The second part of this chapter will present inferential analysis used to illustrate different determinants affecting safety injection applied by health providers. The results are based on 360 self-administering questionnaire, 50 observation checklist and six in-depth interviews, all the respondents consented to the administered questionnaire, observation checklist and interviewer giving a response rate of 100%.

The results of this study could help the researcher in raising and suggestions and recommendations to prevent and reduce unsafe injection practices in primary health care centers in GS.

4.1 Descriptive statistics of Self-administering Questionnaires and In-depth Interview.

4.1.1 Socio-Demographic Characteristics of the Study Population:

The represented sample of the health care providers included in the study was 360 HCWs, who were distributed in regard to selected health facilities (MOH & UNRWA) and socio-demographic characteristics including, governorates, gender, education level and age as shown in Table 4.1.The study sample consisted of 360 health care workers distributed across 30 primary health care centers in GGs. In depth interviews with the decision-makers included 3 decision-makers from MOH and 3 decision-makers from UNRWA to assess their knowledge and attitude related to injection practices, two of them were females and four of them were males.

Table 4.1 Distribution of the study population by health facility (n=360)

Variable	Category	Total	
		Number	Percentage
Health Facility	UNRWA	228	63.3%
	MOH	132	36.7%

As shown in Table 4.1 total of 30 health facilities participated in the study: 11 MOH PHCCs and 19 UNRWA PHCCs. Two thirds of study population was in UNRWA PHCCs represent 63.3% while MOH PHCCs represent 36.7%; these finding are different of results raised by El- Khateeb, 2014 that appeared 49.5% of health care providers were from MOH, while 17.6% were UNRWA, 14.3% were NGOs and 18.7% were private laboratories (El-Khateeb, 2014). This difference varies according to the type of the study, in this study the researcher focuses on injection safety in PHC centers and our sample was proportional for service provision.

As shown in Table 4.2 the study population consisted of 360 health care workers distributed across the GGs. More than one third of participants were from Gaza City (33.3%) followed by the North, Middle Zone, Khan Younis and Rafah that represent (16.7%). These results were according to the population density of Gaza City and response rate.

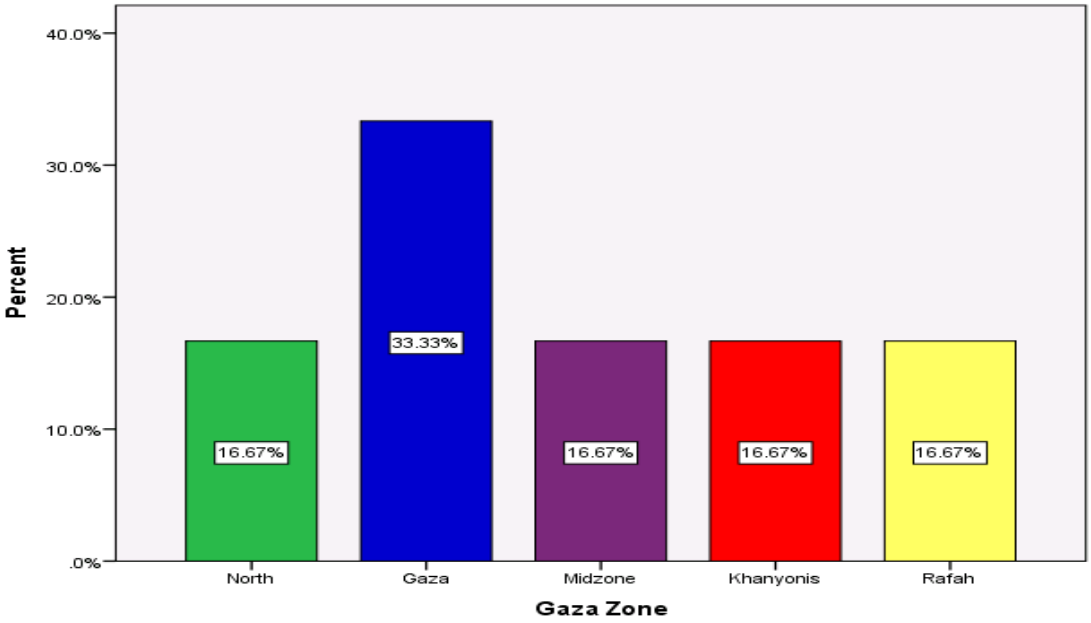


Figure 4.2: Distribution of the study population by governorate

Table 4.2 Distribution of the study population by socio demographic characteristic (n=360)

Variable	Category	Total	
		Number	Percentage
Governorate	Gaza	120	33.3%
	North	60	16.7%
	Midzone	60	16.7%
	Khan Younis	60	16.7%
	Rafah	60	16.7%
Gender	Female	195	54.2%
	Male	165	45.8%
Education Level	BA	236	65.6%
	Diploma	66	18.3%
	M.A.&PHD	58	16.1%
Age (years)	≤ 35 years	123	36.8%
	36-45 years	120	35.9%
	≥ 46 years	91	27.2%

As shown in Table 4.2, the females were more represented in this study than males 54.2% females and 45.8% males. This is consistent with the expected increase in female labour force participation in health departments from 50.2% to 51.7% reported by International Labour Organization (ILO) in 2010. These results are consistent with El- Khateeb results (El- Khateeb, 2014). Two thirds of education levels from our participants hold BA 65.6%, while 18.3% hold Diploma and 16.1% hold M.A & PHD degree. The age of health providers divided into three main groups, the majority of HPs at age group ≤ 35(36.8%), followed by age group 36-45 (35.9%). Health providers at age group ≥ 46 represented the lest score (27.2%). Kitaneh & Hamdan, (2012) study in Palestinian revealed that population (Physcian and nurces) age groups were ≤ 30 years, 31-40 years and 41-60 years were 37.1%, 43.3% and 19.6% respectively (Kitaneh & Hamdan, 2012). In this study the majority of respondents were females (54.2%), younger than 46 years old (27.2%), hold a bachelor's degrees about (65.6%). But in study conducted by Kitaneh & Hamdan, 2012 showed that the majority of respondents were females (59.2%), nurses (65.8%), younger than 41 years old (80.4%), holding a bachelor's or higher degree (76.2%) (Kitaneh & Hamdan, 2012).

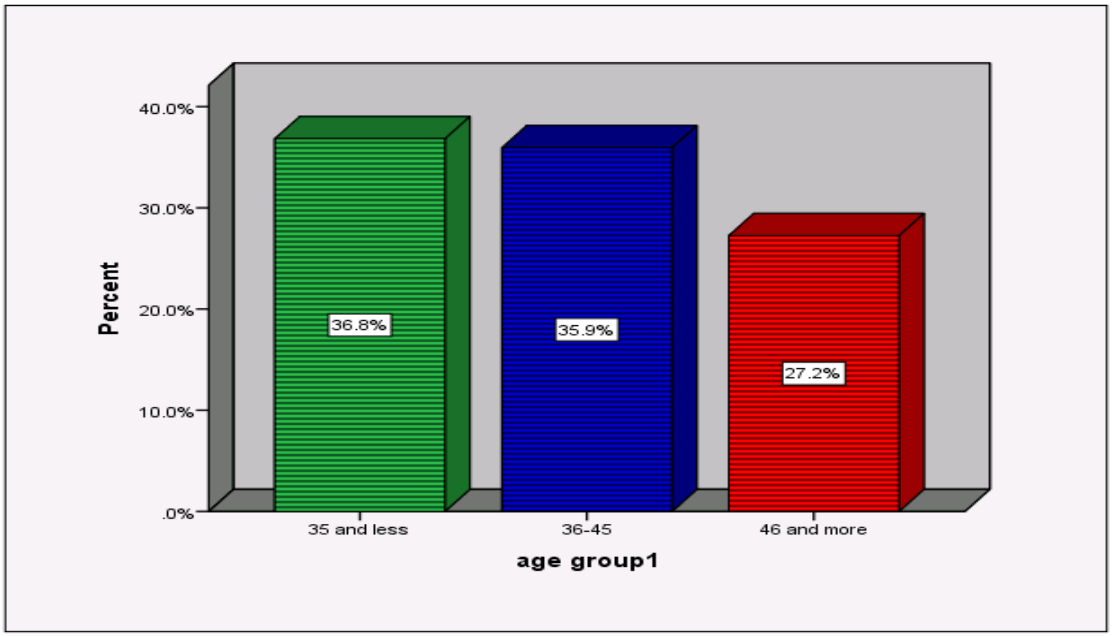


Figure4.3: Distribution of the Study Participants by Age

Table 4.3: Distribution of the study population by Job Title and Years of Experience Characteristics (n=360)

Variable	Category	Total	
		Frequency	Percentage %
Job Title	Physician	122	**33.9%**
	Nurse	90	**25%**
	Lab Tech.	60	**16.7%**
	Head nurse	30	**8.3%**
	SMO	29	**8.1%**
	Dentist	29	**8.1%**
Years of experience inside Gaza	≥ 11 years	225	**63.2%**
	≤ 10 years	131	**36.8%**
Total		**356**	**100%**
Years of experience outside Gaza	< 5 years	92	**80%**
	≥ 5 years	23	**20%**

As shown in Table 4.3 the study population includes six jobs doctors and nurses represent 33.9% and 25% respectively followed by lab technicians, head nurses, dentists and senior medical officers only represent (8.1%), this due to sample size chosen in this study. These results are more than the results produced by Onyemocho (2013) in Nigerian Prison. The Onyemocho (2013) study showed that population jobs were forty one that represent (29.7%) of the community health extension workers, 21.7% were auxiliary medical staffs, 25.4% were nurses, while doctors constitutes the least (2.9%) professional workforces (Onyemocho, et al., 2013). In our study more than half of study population jobs from doctors and nurses (58.9%) but in the study conducted by Onyemocho, 2013 (45%) of study population jobs from auxiliary medical staff and nurses. Years of experience divided into two parts inside Gaza and outside Gaza each part is divided into two groups; Two third of population (63.2%) had experience inside Gaza ≥ 11years while ≤ 10 years represented 36.8%. But (80%) had experience in the years of work outside the GS is located in category < 5 years, while category ≥ 5 years represented only 23%. These results are more than the results produced by Onyemocho (2013) in Nigerian Prison, which represented (36.2%) of population had over 10 years of work experience while (8.7%) of population had less than 10 years of experience (Onyemocho et al., 2013).

4.1.2 Knowledge of injection safety

Table 4.4: Distribution of the study population by knowledge (n=360)

Variable	Yes		No		Don't know	
	N	%	N	%	N	%
Use of syringes and needles one time	346	96.1%	13	3.6%	1	0.3%
Use sterile equip during work	348	96.7%	12	3.3%	1	0.3%
Injection Safety policy	234	65%	89	24.7%	37	10.3%
Injection Safety guideline	266	73.9%	51	14.2%	43	11.9%
Medical waste disposable policy	257	71.4%	64	17.8%	39	10.8%
Medical waste disposable guideline	267	74.2%	48	13.3%	45	12.5%
Education material or counseling for blood and body fluid exposures	213	59.2%	87	24.2%	60	16.6%

As emphasized by Table 4.4, most of the participants (96%) used syringes and needles for one time only and used sterile equipment during work. (4%) from participants mentioned not used syringes and needles for one time only, they were mainly from physicians This result is consistent with Enwere & Diwe, 2014 results in south east

Nigeria, which appeared (82.9%) of HCWs used disposable syringes and needles for one time only (Enwere & Diwe, 2014). More than two thirds of our participants (65%) mentioned that there is presence of injection safety and medical waste disposable policy and guideline. More than half of participants (59.2%) mentioned that the education materials for blood and body fluid exposure are available. During in depth interviews, all of MOH team emphasized that there are no written protocols or guidelines at MOH health facilities, in the other hand all UNRWA team insist that hard and soft copy protocols and guidelines are available and updated in 2010. These results are more than Eljedi, 2014 study in GS, which showed that 59.3% of the participants believed that they knew international guideline infection prevention and control (IPC), 34.2% knew of the existence of a set of national IPC guidelines and absence of an educational program (61.5%) for Palestine (Eljedi, 2014). In regard to Murad (2010) study in GS, which reported that (35.1%) of respondents said there are availability of guidelines and clear policy for procuring and ordering medical equipment and (47.9%) of them said that there are no guidelines and policy (Murad, 2010). During the depth interviews , 90% of key informants defined injection safety according to WHO, which is: "Safe injection is an injection that does not harm the recipient, does not expose the health worker to any risk and does not result in waste that puts the community in risk".

Table 4.5: Distribution of the study population by knowledge score (n=360)

Variable	Category	MOH	UNRW	Total	
				Frequency	Percentage%
Overall knowledge score	High	49	139	188	**52.2%**
	Low	83	89	172	**47.8%**

As shown in Table 4.5, the overall knowledge score on key issues of injection safety was good (52.2%), knowledge of injection safety between health providers in UNRWA was more than knowledge between health providers in MOH, these results are smaller than the results produced by Onyemocho, 2013 study in Nigerian Prison, which appeared that overall knowledge score of the respondents of injection safety was good (54.3%). While my results are more than the results produced by Acharya, 2014 study in India, which described that the knowledge about injection safety was poor 23% (Acharya et al., 2014).

Table 4.6: Distribution of the study population by knowledge about HIV, Hepatitis B and C as transmitted diseases by unsafe injection and knowledge score (n=360)

Variable	Category	Total	
		Frequency	Percentage%
Disease transmitted by unsafe injection	Three diseases	215	**65%**
	Two diseases	73	**22.1%**
	One disease	27	**8.2%**
	Others*	16	**4.8%**

* Others= Disease not mentioned in the list as: septicemia, infection and abscess

As demonstrated in Table 4.6, more than two thirds of participants (65%) knew that three HIV, HBV and HCV could be transmitted by unsafe injection practices, while (22.1%) knew that HIV and HBV could be transmitted by unsafe injection practices, only (4.8%) have poor knowledge about diseases transmitted by unsafe injection practices. Among those with poor knowledge, some of them had misconceptions of abscess and infection. These results were similar to the results produced by Onyemocho (2013) study in Nigerian Prison, which shows (65.9%) of participants knew that HIV, HCV and HBV could be transmitted by unsafe injection practices, while (19.6%) had poor knowledge of the diseases that could be transmitted via unsafe injection practices. Among those with poor knowledge, some had misconceptions of breast cancer (Onyemocho et al., 2013). Regarding to Acharya (2014) study results in India, almost all the participants (98%) had good knowledge about diseases which can be contracted by unsafe injections, namely HIV, hepatitis B and hepatitis C (Acharya et al., 2014).

4.1.3 Practices Related to Injection Safety

In this part we focused on three major practices categories: Needle stick injuries, receiving training of injection safety and vaccinated against hepatitis B.

4.1.3.1 Needle Sticks Injury

Table 4.7: Distribution of the study population by NSI

Variables	Yes		No	
	N	%	N	%
Accidental of NS injury in last years	148	41.4%	211	58.6%
Report of NS injury of supervisor	53	35.8%	95	64.2%
Counseling after reported of NS	52	94.5%	1	5.5%
Treatment or test after NS injury	65	43.9%	83	56.1%

As emphasized in Table 4.7, more than half of participants (58.6%) were not exposed to needle stick injury (NSI), while (41.4%) of participants exposed to needle stick injury. This result was more than the result produced in study conducted by Ganesh, 2015 in India, which reported the prevalence rates of exposed to needle stick injury between nurses was 25.6% (Ganesh et al., 2015). In my study among those exposed to NSI (64%) of participants did not notify the supervisors. While more than one third (35.8%) of them notified to supervisors, these results were higher than the results produced by Gyawali, 2013 study in Baglung, which showed nearly one-third (29.8%) of injection providers reported needle-stick injuries in the last 6 months (Gyawali et al., 2013), most of participants in my study (94.5%) received counseling from supervisors after notified to them. More than two thirds of participants (56.1%) did not receive any treatment or diagnostic test after NSI, while (43.9%) received treatment or diagnostic test. During in depth interviews, UNRWA team said that the reported of needle stick injury cases were referred immediately to preventive medicine department in the MOH, while MOH team said that they deal with NSI cases according to the nature of the case, If the needle stick from hepatitis B patient, if the health provider is vaccinated no action taken, if the health worker is not vaccinated or partially vaccinated, both active and passive vaccine administered. If the needle stick from the patient has hepatitis C (diseased or carrier) no action taken and blood sample from health provider collected to confirm if he had the disease or not. If the needle stick from the patient has HIV prophylactic treatment is given and blood sample collected after 3 months to confirm that he did not got the virus. In study conducted by Ismail in Gharbiya governorate, Egypt (2007), the prevalence rate was

higher than my result 56.5% of the respondents take post exposure prophylaxis immediately after sharp object injuries (Ismail et al., 2007) .

Table 4.8: Distribution of the study population by Times of Needle sticks injury and Type of treatment received.

Variable	Category	Total	
		Frequency	Percentage %
Times of Needle stick injury	None	211	58.6%
	1-3	104	90%
	More than 3	44	10%
Type of treatment	HBsAB diagnosis + poster dose HBV as treatment	24	36.9%
	Hep(B+C) diagnosis	12	18.5%
	Hep(B+C) diagnosis and antibiotics	16	24.6%
	Hepatitis and HIV screen	13	20%

As emphasized in Table 4.8, the participants exposed of NSI were (90%) of them exposed of NSI 1-3 times. This result is higher than the result in the study conducted by Jahangiri, 2015 in Iran, which described a total of 128/168 (76%) of the studied nurses reported at least one NSI in the total of their job tenure, and 69 individuals (54%) experienced at least one NSI in the previous year (Jahangiri et al., 2015). The participants received Hep (B+C) diagnosis and poster dose of HBV after NSI represented (36.9%) followed by (24.6%) received Hep (B+C) diagnosis and antibiotics and (20%) Hepatitis and HIV screening, while in the study of Jahangiri, 2015 showed 70.2% reported washing the injury site with soap and running water is the first treatment after an injury relating to a needle stick. However, pressing the injury site was the second common measure taken by the nurses to protect them from blood borne pathogens after any NSI. Regarding to the study produced by Enwere & Diwe (2014) in Nigeria, which appeared the largest proportion of healthcare providers who had a needle stick injury in the last one year were doctors (50%). Only 30.7% (42/137) knew there was a hospital Needle-Prick Injury Accidents management (NPIAM) protocol and register for post-exposure prophylaxis (Enwere & Diwe, 2014).

4.1.3.2 Receiving Training of Injection Safety and Vaccinated Against Hepatitis B

Table 4.9: Distribution of study population according to training regarding IS and vaccinated against hepatitis B

Variables	Yes		No	
	N	%	N	%
Training regarding IS	120	33.3%	240	66.7%
Vaccinated against Hepatitis B	334	92.8%	26	7.2%

As emphasized in Table 4.9, more than two thirds of our participants (66.7%) mentioned that they did not receive training in regard to injection safety, this result was higher than the result produced by Isamil in Gharbiya governorate, Egypt (2007), which appeared 50.8% of participants did not receive training in regard injection safety (Ismail, et al., 2007). Most of our participants (92.8%) vaccinated against hepatitis B. This result is higher than the result in study conducted by Ganesh, 2015 in India, which showed that (46.5%) of participants have received hepatitis B vaccination, while 53.5% of participants were not vaccinated against hepatitis B (Ganesh et al., 2015).

Table 4.10: Distribution of the study population according to doses of hepatitis B vaccinated

Variable	Category	Total	
		Frequency	Percentage %
Hep B vaccine doses	Three doses	270	82.3%
	Four doses	26	7.9%
	Two doses	20	6.1%
	One dose	7	2.1%
	Five doses	5	1.5%

As shown in Table 4.10, most of participants (82.3%) received three doses of hepatitis B vaccine, while others received four doses, two doses, one dose and five doses 7,9%, 6.1%, 2.1% and 1.5% respectively. These results were good because of vaccinated program which is one of most successful and effective public health interventions programs in Palestine, the coverage rate is almost 99. 8%. These results were higher than the results

produced by Astal study, 2004 in GS, which showed 63.2% of the participants, were vaccinated against hepatitis B. From those, 79.8% had completed hepatitis B vaccination schedule and 20.2% did not complete the three doses of vaccine, where the coverage rate of vaccination in 2004 was less than 90% (Astal et al., 2004). In my study the results were better than the condition reported in the study carried out by Nakarmi in Pokhara city in Dubai (2010), which showed only 71% of HCWs (including doctors) received vaccination against hepatitis B (Nakarmi et al., 2010).

4.1.4 Supply and Logistic of Injection

In this part we focused on two categories of supplies and logistics of injection: Medical disposable supply, distribution and medical waste management.

4.1.4.1 Medical Disposable Supply and Distribution

Table 4.11: Distribution of the study population by medical disposable supply

Variables	Yes		No		Don't know	
	N	%	N	%	N	%
Stock out of needles or syringes	48	13.3%	240	66.7%	72	20%
Stock out of safety boxes	3	0.8%	285	79.2%	72	20%
Designated staff to deal with MW	153	42.5%	119	33.1%	88	24.4%
Designated staff received any training	78	51%	23	15%	52	34%
Emergency order is placed for deficiency in equipment	150	41.8%	49	13.6%	160	44.6%
You placed any emergency order in last 6 months	49	13.6%	238	66.1%	73	20.3%

As illustrated in Table 4.11, 66.7% of our participants mentioned that there is no stock out of needles, syringes and safety boxes. While (13.3%) mentioned that there is stock out of needles and syringes. These results are lower than the results conducted by health situation report in GS 2014, which showed 31.4% of medical equipment and disposable items, such as bandages, syringes, and plaster was lacking (Dvaladze, 2014), this is due to the siege that Israel had imposed on the GS since Hamas took control over GS in June 2007 which

had greatly harmed Gaza's health system. 42.5% of our participants mentioned that there is no presence of designated staff to deal with medical waste, While (33%) of participants mentioned yes there is a presence of designated staff to deal with MW. Nearly half of participants (51%) answered there is a present of designated staff mentioned designated staff received training to deal with MW, while (34%) answered that they don't know, while all decision makers during in depth interviews said yes there is a designated staff that disposes health care waste, half of them said that the designated staff that handles healthcare waste received training in waste management and other half mentioned that they did not receive training. The study results are smaller than results produced by Kahissay (2014) study in Ethiopia, which showed (83%) of cleaners and sanitarians had participated in training related HCW management (Kahissay et al., 2014). 44.6% of our participants don't know if presence of emergency order is placed for deficiency in equipment, while (41.8%) mentioned there is emergency order is placed for deficiency in equipment. More than two thirds (66%) mentioned no placed any an emergency order in last 6 months, while (13.6%) mentioned there was a placed emergency order in the last 6 months, in the same time all decision makers during in depth interviews said that when there is shortage in injection equipment, they placed emergency order for equipment and all of them said that there were placed emergency orders for injection equipment in the last six months and it was compensated within the same day from health facility to another or within 24 hours from main store to health facility. This result is better than the result produced in Health situation report (2014), which showed that they stopped work in departments when occur of shortage in equipment as syringes and needles (Dvaladze, 2014).

Table 4.12: Distribution of study population by period of stock out of needles, syringes and safety boxes and period of emergency order take to arrive.

Variable	Category	Total	
		Frequency	Percentage %
Period of needles and syringes out of stock	1-2 months	25	53.2%
	3-6 months	11	23.4%
	Less than one month	9	19.1%
	Don't know	3	4.3%
Period of safety boxes out of stock	3-6 months	2	0.6%
	Don't Know	1	0.3%
Emergency order take to arrive	Less than one week	142	84.3%
	1-2 weeks	5	9.8%
	More than 2 weeks	2	3.9%
	Don't know	1	2%

As shown in Table 4.12, 53.2% of participants mentioned 1-2 months period stock out of needles and syringes. Most participants answered there is no stock out of safety boxes, there for only 0.6% mentioned 3-6 months stock out of safety boxes. 84.3% of participants mentioned less than one week emergency order tacked to arrive. In the study conducted by Abdul Aziz (2013) in Ghana, which showed (100%) in Bongo and (77.8%) in Talensi Nabdam had tacked one week of supply of disposable/AD syringes to arrive (Abdul Aziz et al., 2013). According to Initial Health Assessment Report (IHAR) in GS (2012), which appeared that after the Israeli siege (in place since 2007) and by the political division between WB and Gaza, the main challenge in the health sector in GS before and during this crisis was the availability of drugs and medical supplies; more than 50% of medical supplies were out of stock before and during the crisis (IHAR, 2012).

Table 4.13: Distribution of study population according to methods used to deal with shortage in equipment

Variable	Category	Total	
		Frequency	Percentage %
How deal with shortage in equipment?	Notify in charge person	120	33.3%
	DK	37	10.3%
	Borrowing from other health center	26	7.2%
	No shortage occurred	23	6.4%
	Stop work	22	6.1%
	Notify in charge person and borrowing from other health center	11	3.1%
	Refer to hospital	8	2.2%
	Send SDN from central pharmacy	4	1.1%
	Make control of use syringes	2	0.6%
	Patient buy	2	0.6%
	Borrowing from other health center or patient buy	1	0.3%
	We rely on donation or stop work	1	0.3%
	Notify in charge person and stop work	1	0.3%

As shown in Table 4.13, more than one third of participants (33.3%) mentioned notify to a charged person as method to deal with shortage in equipment, while (10.3%) don't know, (7.2%) borrowing from other health center, (6%) mentioned no shortage in equipment occurred and (6%) mentioned stopped the work in case of shortage in equipment. In the report about health situation in Gaza (2014) shown that 31% of vital medical equipment is lacking after three wars. There is also a grave shortage of replacement parts for equipment and of disposable items, such as bandages, syringes, and plaster for casts lead to stopped work in Palestinian MOH departments (Dvaladze, 2014). In the study conducted by Ismail (2007) in Gharbiya Governorate, Egypt, which founded lack of infection control policies in all the facilities and a lack of many supplies needed for safe injection.

4.1.4.2 Medical Waste Management

Table 4.14: Distribution of study population according to kind of protective equipment used to deal with medical waste

Variables	Category	Total	
		Frequency	Percentage %
Kind of protective equipment used to deal with medical waste	Gloves	145	40.3%
	Gloves, Mask, Gown, Hat and Boots	83	23.1%
	Gloves, Mask and Gown	60	16.7%
	Gloves and Gown	32	8.9%
	None equip	30	8.3%
	Gown	4	1.1%
	Others as safety boxes	2	0.6%
	Gloves and others as safety boxes	2	0.6%
	Gloves, Boots, Mask, Hat, Gown and others	1	0.3%
	Gloves, Mask and Hat	1	0.3%
	Don't know	1	0.3%

As illustrated in table 4.14, more than one third (40%) of participants mentioned gloves as protective equipment used to deal with medical wastes in PHCs, (23%) mentioned (gloves, boots, hat, mask and gown), (16.7%) mentioned (gloves, mask and gown) and 8.9%, 8.3% mentioned (gloves and gown) and no equipment used to deal with medical wastes respectively. These results were lower than results produced by Onyemocho (2013) in Nigerian, which that appeared (86.2%) of the participants wear gloves when handling hospital wastes, but only (7.2%) of them wear single use gloves before administering injections (Onyemocho et al., 2013). In Nigeria, Gyawali (2013) in Baglung district, western Nepal showed that all waste handlers do not use industrial gloves when handling wastes, only 16.7% use boots while working. Over half (58.2%) of the respondents routinely use an apron/overall during working (Gyawali et al., 2013).

Table 4.15: Distribution of study population according to dealing with safety boxes after filling

Category	MOH	UNRWA	Total	
			Frequency	Percentage %
Transfer it to nearest hospital	60	112	172	47.8%
Don't know	27	40	67	18.6%
Kept in secured place	22	21	43	11.9%
Kept in lock secured place and transfer it to nearest hospital	9	25	34	9.4%
Transfer it to central garbage	11	21	32	8.9%
Kept in lock secured place, transfer it to nearest hospital and transfer it to central garbage	1	5	6	1.7%
Incinerated inside health center	0	3	3	0.8%
Kept in lock secured place and transfer it to central garbage	1	1	2	0.6%
No good method to remove safety boxes	1	0	1	0.3%

As emphasized in Table 4.15, nearly half of participants (47.8%) transferred the safety boxes after filling to the nearest hospital, while (18.6%) answered with don't know how to deal with safety boxes after filling, (11.9%) kept them in secured place, nearly (9%) answered they kept the safety boxes in lock secured place and transfer them to the nearest hospital and (9%) answered transfer the safety boxes to the central garbage. In the study conducted by Akum (2014) in Ghana, which showed (80%) of the cleaning workers said that the medical waste is transferred to the large storage containers and (20%) indicated that needles are put in sharps boxes and kept at incinerator (Akum, 2014). Regarding to Gyawali (2013), the main waste disposal technique for disposing used injection equipment was incineration (burning) in a pit 80% (Gyawali et al., 2013).

4.2 Inferential statistic of self-administering questionnaire

4.2.1 Knowledge of injection safety

4.2.1.1 Knowledge of injection safety and Health facility

Table 4.16: Relationship between knowledge and health facility

Variables	Category	N	Mean	SD	t test	P value
Health facility	MOH	132	3.07	1.569	5.784	0.00
	UNRWA	228	4.01	1.334		

As illustrated in table 4.16, there are differences in knowledge score among participants by health facility. These differences are statistical significant (t-test = - 5.784 and P- value = 0.00). In these results we observed mean of UNRWA health facilities (4.01) more than mean of MOH health facilities (3.07), this mean of staff work in UNRWA health facilities had more knowledge of injection safety compared to staff work in MOH health facilities. Decision makers explained that as follow: five out of six said that it's due to continuous training and follow up, five out of six said that it's due to continuous supervision, four out of six said that it's due to clear guidelines and protocols, One from MOH and another from UNRWA said that it's due to commitment and accountability among UNRWA health workers more than MOH health workers.

4.2.1.2 Knowledge and Socio-demographic Factors

Table 4.17: Relationship between knowledge and socio demographic factors

Variables	Category	N	Mean	SD	t test	P value
Gender	Male	165	3.53	1.524	1.529	0.127
	Female	195	3.77	1.461		
Years of experience inside Gaza	≤ 10 years	131	3.49	1.459	1.630	0.104
	≥ 11 years	225	3.76	1.508		
Years of experience outside Gaza	< 5 years	92	3.54	1.486	0.818	0.415
	≥ 5 years	23	3.83	1,466		

As illustrated in table 4.17, there are differences between means of knowledge score of injection safety and sex of participants, mean of females represented in this study (3.77) more than mean of males (3.53). These differences did not reach to statistical significant (t test = -1.529, P value = 0.127). This result was different from the result showed by

Omorogbe (2012), which revealed that there was a statistically significant association between the sex (P value = 0.022) of the respondents and their knowledge of injection safety (Omorogbe et al., 2012). Differences between knowledge score of injection safety and years of experience of participants inside and outside Gaza did not reach to statistical significant (t test = -1.630, -0.818, P value = 0.104, 0.415) respectively, the mean of participants had 11 years of experience and more inside GS (3.76) that is more than mean of participants who had 10 years and less experience inside GS (3.49), the same of participants had experience outside GS, this is due to more knowledge of injection safety between participants who had more years of experience in their work. This result was also different from result reached by Onyemecho (2013) in Nigeria, which showed years of experience in injection safety protocols were significantly related to knowledge and practice of injection safety (P value =0.032 and 0.003 respectively) (Onyemecho et al., 2013) and results conducted by Mahfouz (2009) in south-western Saudi Arabia, which showed a statistically significant association between years of experience (P value < 0.05) of the respondents and their knowledge of injection safety, The knowledge increased due to the years of experience (Mahfouz et al., 2009). But my results were consistent with the results in the study conducted by Ismail (2014) in Saudi Arabia, which showed that there was no statistical significant between knowledge and years of experience of health providers in primary health care centers (P value = 0.91) (Ismail et al., 2014).

Table 4.18: Relationship between knowledge, education level, age by years and job title

Variables	Category	N	Mean	SD	F	P value
Education level	Diploma	66	4.39	0.95	3.898	0.021
	BA	236	3.96	1.23		
	M.A&PHD	58	3.89	1.19		
Age (years)	35 and less	123	4.01	1.22	2.829	0.06
	36-45	120	3.83	1.25		
	46 and more	91	4.23	1.096		
Job title	SMO	29	4.31	0.96	3.600	0.003
	Physician	122	3.73	1.27		
	Head nurse	30	4.4	1.03		
Job title	Dentist	29	3.8	1.33		
	Lab technician	60	4	1.14		
	Nurse	90	4.03	1.19		

As illustrated in table 4.18, which shows differences between knowledge score of injection safety and education level, the differences between the 2 groups have statistical significant (F = 3.898, P value = 0.021). Mean of participants who they had diploma certificate are (4.39) more than mean of other certificates, this mean decreases in level of education, increase in knowledge of injection safety. Post hoc test shows that the main statistical significant was reported among the two categories diploma and BA (P value = 0.03), this is due to health providers who had diploma certificate exercise more for injection practices, so they have more knowledge of injection safety. These results were different from results reached by Ismail (2014), which showed no statistical significant between knowledge and education level (P value = 0.74). While differences between knowledge and age by years did not reach to statistical significant (F= 2.829, P value 0.06), mean of participants more than 46 years old (4.29) and is more than the mean of other age groups, this is due to increase in the age of health providers, increase in knowledge of injection safety. Although Post hoc test shows there are statistical significant differences among the two categories ≥ 46 years and 36-45 years (P value = 0.047). This result is different from result conducted by Omorogbe (2012) in Nigeria, which appeared there was a statistically significant association between the age (P = 0.005), of the respondents and their knowledge of injection safety. The knowledge increased with increasing age of respondents (Omorogbe et al., 2012). Also in table 4.15, showed that there were differences between knowledge of injection safety and job title, differences between two groups reached to statistical significant (F= 3.600, P value = 0.003), we observed according to the means the mean of head nurses (4.4), SMO (4.31), nurses (4.03) and lab technician (4.4) are more than dentist (3.8) and physicians (3.73) as described in table 4.15, this means that physicians have less knowledge of injection safety but, head nurses and nurses have more knowledge of injection safety. Post hoc test shows that the main statistical significant was reported among the two categories physician and nurse (P value = 0.037). More knowledge was founded between medical staff that who used injection during work as head nurses, nurses and lab technician. During in depth interview key informants pointed the accumulative experience of head nurses due to attendance of several workshops and seminars of injection safety and two of them said that it's due to the main cause that the role of head nurse is to supervise others, so she supposed to be more knowledgeable. These results are consistent with results conducted by Onyemecho (2013), which appeared a statistically significant relationship between the cadre of health worker and knowledge of injection

safety P value < 0.005, more knowledge founded between nurses (Onyemecho et al., 2013).

Table 4.19: Relationship between knowledge and governorates

Variables	Category	N	Mean	SD	F	P value
Governorates	North	60	3.71	1.31	3.457	0.009
	Gaza	120	3.85	1.26		
	Midzone	60	4.18	1.03		
	Khan Younis	60	4.35	1.11		
	Rafah	60	4.21	1		

As shown in table 4.19, there are differences between knowledge score of injection safety and governorates, the differences reached to statistical significant (F = 3.457, P value = 0.009), according to mean the researcher observed the highest knowledge of injection safety between health providers in Khan Younis governorate (mean = 4.35) followed by Rafah (mean = 4.21), Midzone (mean = 4.18) then Gaza (mean = 4.18). The least knowledge between health providers in North (mean = 3.71). Post hoc test shows that the main statistical significant was reported among the two categories Khan Younis and North (P value = 0.028). During in depth interview one from MOH and two from UNRWA said that it's due to less population density in the south governorate and less work over load, one mentioned that because of the HWs have more commitment to the work and due to continuous supervision and two said that they have no explanation.

4.2.1.3 Knowledge and Practices Related to Injection Safety

Table 4.20: Relationship between knowledge and times of needle stick injury and Hepatitis B vaccine doses.

Variables	Category	N	Mean	SD	F	P value
Times of needle stick injury	None	220	4.06	1.19	0.517	0.596
	1-3	104	3.93	1.20		
	More than 3	36	4.11	1.11		
Hepatitis B vaccine doses	One dose	7	4.14	1.214	0.554	0.697
	Two doses	20	3.7	1.218		
	Three doses	270	4.09	1.17		
	Four and five doses	31	4	1.27		

As illustrated in table 4.20, which showed differences between knowledge score and times of needle stick injury, These differences were not statistical significant (F = 0.517 and P value = 0.596). The mean of participants exposed to NSI more than 3 times (4.11) more than mean of participants not exposed of NSI (4.06) and participants exposed from 1-3 times of NSI (3.93). This result is consistent with result in study conducted by Mahfouz (2009), which showed relationship between knowledge of injection safety and times of NSI not statistically significant (P value = 0.38). Also as described in the same table the differences between Hepatitis B vaccine doses and knowledge was not statistical significant (F = 0.554 and P value = 0.697), mean of participants vaccinated by one dose of hepatitis B (4.14) more than means of other participants received two, three, four and five doses of hepatitis B vaccine, this is due to the most of participants believe that a single dose of hepatitis B vaccine capable of protecting them from disease. This result was different from result in study conducted by Garapti & Peethala (2014) in India, which appeared relationship between Knowledge and hepatitis B vaccine doses was statistically significant (CI: 38.1- 45.3) (Garapti & Peethala, 2014).

Table 4.21: Relationship between knowledge and different variables of practices related to injection safety

Variable	Variable	Category	SD	Mean	t test	P value
Knowledge	Training regarding injection safety	Yes	0.00	2	3.256	0.002
		No	0.376	1.83		
	Reported of needle stick injury	Yes		1	1.629	0.1
		No	0.447	1.74		
	Vaccinated against hepatitis B	Yes	0.00	1	3.036	0.004
		No	o.359	1.15		

As illustrated in table 4.21, which showed differences between knowledge score of injection safety and training of health providers on injection safety, these differences reached to statistical significant (t test = 3.256, P value = 0.002), this mean increased in knowledge of injection safety between health providers who received training of injection safety. This result is consistent with the study conducted in Syria Arab Republic, which appeared after having the training program in injection safety of the HCWs and waste management as intervention program their behavior is completely changed, needle recapping significantly reduced and safety boxes use increased (Mantel et al., 2007). Also

this result was similar to result conducted by Onyemecho (2013), which appeared that the training of workers on injection safety protocols were also significantly related to the knowledge of injection safety (P value = 0.032) (Onyemcho et al. 2013), and differences between knowledge and vaccination against hepatitis B reached to statistically significant (t test = 1.629, P value = 0.004). This result was consistent with result in study conducted by Garapti & Peethala (2014), which showed that the knowledge of participants on the importance of preventive hepatitis B immunization was statistical significant (CI: 65.7-76.5) and P value < 0.05. In the same table the researcher observed the differences between knowledge score of injection safety and reported of needle stick injury did not reach to statistical significance (t test = 3.036, P value = 0.1).

4.2.1.4 Knowledge, Supply and Logistic of Injection Safety

Table 4.22: Relationship between knowledge, kind of protective equipment and deal with safety box after filling

Variables	Variable	N	Mean	F	P value
Knowledge	Kind of protective equipment	360	42.420	3.839	0.005

As illustrated in Table 4.22, the relationship between kind of protective equipment and Knowledge was statistically significant (F = 3.839 and P value = 0.005), this mean increase use of protective equipments by health providers who have more knowledge of injection safety. Post hoc test shows that the main statistical significant was reported among two categories health providers answered two questions from five questions about knowledge and health providers answered all questions about knowledge (P value = 0.017).

Table 4.23: Relationship between knowledge and deal with safety box after filling

Variables	Variable	N	Mean	F	P value
Knowledge	Deal with safety boxes after filling	359	2.095	0.652	0.626

As shown in Table 4.23, there are relationship between knowledge score of injection safety and methods used to deal with safety boxes after filling, but this relationship did not reach to statistical significance (F = 2.095 and P value = 0.626).

Table 4.24: Relationship between knowledge and designated staff received training of waste management

Variable	Variable	Category	Mean	SD	t test	P value
Knowledge	Designated staff received training of waste management	Yes	2.50	0.837	1.065	0.306
		No	2.20	0.626		

As illustrated in table 4.24, the researcher observed differences between knowledge score of injection safety and designated staff received training of waste management did not reach to statistical significance (t test = 1.065 and P value = 0.306), according to differences in mean designated staff received training of waste management had more knowledge of injection safety.

4.2.2. Practices of Injection Safety

4.2.2.1 Practices of Injection Safety and Health Facility

Table 4.25: Relationship between accidental of needle stick injury, training regarding IS, vaccinated against hepatitis B and health facility.

Variable		MOH		UNRWA		P value
		Freq.	%	Freq.	%	
Accidental of NSI in last year	Yes	58	43.9%	91	39.9%	0.45
	No	74	56.1%	137	60.1%	
Total		132	100%	228	100%	
Training regarding IS	Yes	48	36.4%	72	31.6%	0.35
	No	84	63.6%	156	68.4%	
Total		132	100%	228	100%	
Vaccinated against hepatitis B	Yes	115	87.1%	219	96.1%	0.002
	No	17	12.9%	9	3.9%	
Total		132	100%	228	100%	

As illustrated in table 4.25, there are relationship between accidental of NSI in last year among participants and health facilities, Chi Square test reveals that the highest prevalence rate of NSI in last year was among MOH health centers (43.9%). The relationship was not statistically significant (P value 0.45). These results were consistent with the results conducted by Gyawali (2015) in Western Nepal, which founded differences between needle stick injury and participants in primary health centers in rural and urban area. Accidental of NSI occurred more between health care providers in primary health centers

in rural area, this relationship did not reach to statistical significance (P value > 0.05) (Gyawali et al., 2015). In the same table we showed relationship between training regarding IS and health facility, according to Chi Square test the highest prevalence rate of raining regarding IS was among MOH health centers (36%). This relationship not reaches to statistically significant (P value 0.35). These results were different from results conducted by Ismail (2014) in Jazan region, Saudi Arabia, which founded differences in training of injection safety between health providers in rural and urban area. Health providers in urban area received more training of injection safety, these differences reached to statistically significant (P value 0.023) (Ismail, 2014). Also as described in the same table the differences between health providers vaccinated against hepatitis B and health facility reached to statistically significant (P value 0.002). Chi Square test reveals that the highest prevalence rate of health providers vaccinated against hepatitis B in UNRWA health centers (96.1%). These results were different from results conducted by Mahfouz (2009) in south-western Saudi Arabia, which founded differences between vaccination of hepatitis B and health providers in primary health care centers, according to Chi Square nurses vaccinated against hepatitis B more than physician. This relationship did not reach to statistically significant (P value > 0.05) (Mahfouz et al., 2009).

4.2.2.2. Practices of injection safety and Socio-demographic Factor

Table 4.26: Relationship between practices of injection safety and education level

Variable		Diploma		BA		M.A. & PHD		P value
		Freq.	%	Freq.	%	Freq.	%	
Accidental of NSI in last year	Yes	42	63.6%	89	37.7%	18	31.6%	0.00
	No	24	36.4%	147	62.3%	40	68.4%	
Total		66	100%	236	100%	58	100%	
Training regarding IS	Yes	28	42.4%	76	32.3%	16	28.1%	0.28
	No	38	57.6%	160	67.8%	42	71.9%	
Total		66	100%	236	100%	58	100%	
Vaccinated against hepatitis B	Yes	60	90.9%	219	92.8%	55	96.5%	0.002
	No	6	9.1%	17	7.2%	3	3.5%	
Total		66	100%	236	100%	58	100%	

As shown in table 4.26, which shows differences between accidental of NSI in last year and education level of health care providers, differences between two groups reached to statistical significance (P value 0.00). Chi Square test shows that the prevalence rate of accidental of NSI in last year among health providers have diploma certificate (63.6%), followed by prevalence rate among health providers have bachelors certificate (37.7%) and

the least prevalence was among master degree and PHD (31.6%), this is due to health providers who had diploma certificate exercise more for injection practices. These results were consistent with results in a study conducted by Fayez (2014), which founded differences between accidental of NSI and different certificates reached to statistical significant (P value < 0.01) (Fayez et al., 2014). As described in table 4.23, the differences between training regarding IS and education level of health care providers did not reach to statistically significant (P value 0.28), Chi Square test shows that the prevalence rate of training regarding IS among health providers have diploma certificate (42.4%), followed by prevalence rate among bachelors certificate (32.3%) and the least prevalence rate was among master and PHD degree (28.1%). These results were different from results conducted by Onyemecho (2013), which showed training of injection safety among health providers were statistically related to degree of certificates (P value 0.003) (Onyemecho et al., 2013). In the same table we showed the differences between vaccinated against hepatitis B and education level of health providers reached to statistically significant (P value 0.002), the prevalence of vaccinated against hepatitis B among health providers have master and PHD degree were (96.5%), followed by prevalence rate among bachelors certificates (92.8%) and the least prevalence rate among diploma certificates (90.9%), this is due to number of health providers have master degree and PHD are less than the rest certificates. These results were consistent with results conducted by Yacoub (2010) in Syria, which founded differences between vaccinated against hepatitis B and education level of health providers were statistically significant (P value 0.00), according to Chi Square test prevalence rate of hepatitis B among nurses have diploma certificates (68.6%) more than others certificates (Yacoub et al, 2010).

4.3 Descriptive Statistics of Observation Checklist

4.3.1 Characteristics of Observation Checklist:

To get more accurate and actual information, I chose to do observation checklist to assess the physical environment of HCWs practices during the work hours to stand on real situation and to compare their actual practices with what they answered on the questionnaire. The study was conducted at 10 health facilities, (5 MOH & 5 UNRWA) distributed in Gaza governorates in equal percentage, North Gaza, Gaza, Mid zone, Khan Younis and Rafah (2 health centers in each governorate), each health center included a cluster of 5 health professionals (dental room, injection room, vaccination unit and lab unit). I observed the stores and the waste disposal sites in each governorate.

Table 4.27 Distribution of observation checklist by health facility and Gaza Governorates (n=10)

Variable	Category	Total	
		Number	Percentage
Health Facility	UNRWA	5	50 %
	MOH	5	50 %
Governorates	North Gaza	2	20%
	Gaza	2	20%
	Mid zone	2	20%
	Khan Younis	2	20%
	Rafah	2	20%

As shown in Table 4.27, total of 10 health facilities participated in the study: 5 MOH PHC centers and 5 UNRWA PHC centers. 50% of observation checklist was in UNRWA PHCs represented and 50 % represented in MOH PHCs; two health centers in each governorate (MOH & UNRWA) represented 20% in each governorate.

Table 4.28: General observation in the health care center based on checklist list

Variable	Yes		No	
	N	%	N	%
Loose disposable needles and syringes inside health facility	0	0	10	100 %
Loose disposable phlebotomy equipment inside health facility	0	0	10	100 %
Loose disposable intravenous infusion equipment inside facility	0	0	10	100 %
There is any multi-dose vial with a needle left in the diaphragm	4	40 %	6	60 %
There are used sharps in an open container in any area of the facility	0	0	10	100 %
There are any containers separate according to medical wastes	0	0	10	100 %
There is at least one puncture resistant and leak proof sharps container in all areas	9	90 %	1	10 %
There are reminder or job aid for injection safety	0	0	10	100 %
All safety boxes completely closed before destruction	7	70 %	3	30 %
All sharp container stored in locked area	6	60 %	4	40 %
There are used sharps on the ground outside the health facility	2	20 %	8	80 %

As shown in Table 4.28, in all health facilities (100%) no needles, syringes, phlebotomy equipment and intravenous infusion equipment loose inside health facility. This result is better than the result in the study conducted by Bolarinwal (2012) in Nigeria, which showed that (33.3%) used needles were seen inside the floor of health facilities (Bolarinwal et al., 2012). 40% of health facilities left multi dose vials with needles in diaphragm, while (60%) of health facilities did not leave any multi dose vials with needles in diaphragm. This result was higher than the result in the study conducted by Gyawali (2015) in Western Nepal, which found (31.7%) of wards in primary health care left multi dose vials and needles in diaphragm (Gyawali et al., 2015). And in the study conducted by Garapati & Peethala (2014) in India, which showed (21.5%) of participants were leaving the needle to draw additional doses of medicine or vaccine in diaphragm (Garapati & Peethala, 2014). As described in table 4.29, 100 % there was no presence of open container in any area of health facilities. This result was better than the result conducted by Mahfouz (2009) South-western Saudi Arabia, which found (69.8%) boxes to collect needles was not closed. In our study I observed 100% there was no present of separate containers of medical waste. In study conducted by Gadzama (2014) Northeastern Nigeria, which showed only 7.4%, of units surveyed had separate waste boxes for infectious non-sharps (Gadzama et al., 2014). In our study observed there is at least one puncture resistant and leak proof sharps container in all areas in (90%) of health facilities, while (10%) of health facilities I did not observe safety boxes in all areas of health facilities. These results were lower than the results produced by Gyawali (2015), which showed (22.6%) of health providers did not have the safety box near them. In our study (100%) there was no present to any job aid or reminder of injection safety inside health facilities. These results are worse that the result produced by USAID (final report) in Ethiopia (2009), which observed only (15%) available of guideline or reminder of injection safety inside the wards of health facilities. (70%) of health facilities in our study are completely closed of safety boxes before destruction, while (30%) of health facilities are not completely close the safety boxes before destruction. These results are lower than results conducted in USAID final report in 2009, which showed (48%) of full safety boxes, were not tightly sealed. As described in table 4.29, 40% of health facilities have no store sharp containers in locked area. This result is higher than the result conducted by Ismail (2014) in Jazan Region, Saudi Arabia, Which found (27%) full sharp containers are stored in a locked area (Ismail, et al., 2014). In this study there is presence of 20% of used sharp on the ground outside the

health facility. These results are better than the result produced by Gyawali (2015) in Western Nepal, which found sharp scattered around healthcare facilities 20% in health facilities in rural area.

Table 4.29: Percentage of hygiene in general observations classified by the site inside the clinic

Hygiene practices observed	Injection room	Vaccination room	Dental room	Laboratory	Total percentage
Presence of source of clean water	80%	60%	100%	70%	77.5%
Presence of soap	70%	60%	50%	40%	55%
Presence of clean hand towel	0 %	10%	10%	0	5%
Presence of disinfected surface	90%	100%	100%	90%	95%
Washing hands with soap before injection	0	0	0	0	0
Cleaning hands with alcohol before injection	0	0	0	0	0
Preparation of injection on cleaned table	70%	80%	100%	90%	85%
Sterilization of dental syringes	_	_	100%	_	100%
Preparation of injection using sterilization technique	0	0	20%	0	5%
Cleaned the rubber cap with antiseptic in multi doses vial	10%	0	_	_	5%
cleaned the rubber cap which previously used swab in multi doses vial	0	0	_	_	0
The patient's skin cleaned with alcohol before the injection	100%	100%	_	100%	100%
Presence of used swap in work place	40%	20%	50%	30%	35%
Cleaned the work area with disinfectant after the procedure if present blood	100%	90%	80%	100%	92.5%
Cleaning hands after injection	10%	0	0	0	2.5%
Any other sterilization method being used to sterilize devices	0	0	0	0	0

As emphasized by table 4.29, availability of source of clean water in primary health care centers in GSs represents (77.5%). This result is better than the result conducted by WHO (2015), which appeared access to water in Sierra Leone in primary health care facilities was (61%) (WHO, 2015), in the same table we observed availability of soap in departments of PHCs only (55%). This result is lower than the result observed by WHO, 2015 which showed Access to soap for hand washing is (65%) in PHCs in the African Region, in my study availability of clean hand towel in PHCs (5%). According to WHO, 2015 this result was lower than the result which found (35%) of health care facilities in low and middle income countries don't have sanitation materials such as clean hand towel. In my study we observed the availability of disinfected surface and preparation of injection on cleaned table (95%, 85%) respectively in PHCs. This result is better than the result conducted by Gadzama (2014) in northeastern Nigeria, which showed (77.3%) of the observed vaccination and therapeutic injections, respectively, were prepared on a clean, dedicated table or tray where contamination of the equipment with blood, body fluids, or dirty swabs was unlikely (Gadzama et al., 2014). As shown in table 4.30, health providers don't care to hand washing practices or cleaned their hands by alcohol before and after injection procedure. These results were worse in compared with the results conducted by Ismail (2014) in Jazan region, Saudi Arabia, which observed more than 80% of HCWs washed their hands by soap and water or cleaned them by alcohol before and after giving injection (Ismail, et al., 2014). In our study we observed sterilization of dental syringes (100%) by autoclave and no other sterilization method being used to sterilize devices, this result is better than the result conducted by Ahmad (2013) in Dhaka city in Bangladesh, which showeded that (73.6%) of respondents sterilize the equipment by autoclave 16 (14.5%) by hot air oven, 55 (50.0%) by boiling device and 74 (67.3%) by chemical method (Ahmad et al., 2013). We observed (20%) of health facilities used sterilization method during preparation of injection. This result is lower than the result conducted by Ahmad, 2013 which showed (39%) of respondent used sterilization technique during injection preparation in dental rooms. As shown in table 4.30, only (5%) of health providers in health centers cleaned the rubber cap of multi doses vial with antiseptic swabbed. This result is lower than the result conducted by Gyawali (2015) in Western Nepal, which found (52.2%) of health providers cleaned the rubber cap with alcohol swabbed (Gyawali, et al., 2015). We found all health providers (100%) cleaned the patient's skin with alcohol before the injection, this result is higher than the result conducted by Garapati & Peethala (2014)

in India, which found only half of the (52.7%) service providers were cleaning the injection site before giving injections due to inadequate supply of disinfectant (alcohol) (Garapati & Peethala, 2014). In our study we observed (35%) used swab in work area and (92.5%) of health providers cleaned the work area with disinfectant after the procedure. This result is lower than the result conducted by Reglow (2006) in Pakistan, which that founded (42%) used swabbed in work area and (59%) of health providers cleaned the work area with alcohol after procedure (Reglow et al., 2006).

Table 4.30: Percentage of practices of injection safety observations classified by the site inside the clinic

Injection practices observed	Injection room	Vaccination room	Dental room	Laboratory	Total percentage
Patient do not move during injection procedure	100%	100%	100%	100%	100%
Safe and enough space for safe injection	100%	100%	100%	100%	100%
Sterile syringe/ packet opened in front of patient	100%	100%	100%	100%	100%
Sterile needle packet opened in front of patient	100%	100%	100%	100%	100%
Volume of dose to be administered correct	100%	100%	100%	100%	100%
Diluents of vaccine or drug from the same manufacturer	0	100%	_	_	50%
Syringe and needle each were taken from a sterile unopened packet	100%	100%	100%	100%	100%
The needle removed from the rubber cap of each multi dose-vial after withdrawing each dose for administration	50%	0	100%	_	50%
Used small gauze pad to protect fingers when breaking the top from the glass ampoule	0	0	_	_	0
Finger not touching the needle	80%	90%	100%	100%	92.5%
Needles re-capped	10%	0	90%	0	25%
The health provider recap a needle using two hands	10%	0	90%	0	25%
Heat of vaccines vial is kept between +2/+8°C during injection preparation and administration	_	100%	_	_	100%
After the procedure, the health provider used a clean gauze pad and gently apply pressure to the puncture site to stop bleeding	100%	100%	100%	100%	100%
If a hematoma developed during a procedure the health provider terminate the procedure and apply pressure on hematoma	100%	-	-	100%	100%
The health provider transferred blood from a syringe/needle into a vacuum tube by inserting the needle directly into the tube, she/he use two-handed transfer technique	-	-	-	100%	100%

As shown in table 4.30, all patients do not move during injection procedure, all health centers that are included in this study have enough space for injection, all health providers in health centers used sterile syringes and needles from packet opened in front of patient, all health providers drew volume of dose to be administered correctly, these results are better than the results conducted by Abkar (2013) in Yemen, which found (98%) of syringes and needles are disposable and taken from sterile packet, (98%) of health providers drew correct dose and injected in correct site (Abkar et al., 2013). We observed (50%) diluents of vaccines or drugs used from the same manufacture of vaccines or drugs. This result is lower than the result conducted by Gyawali (2015), which found all diluents of vaccines or drugs are from the same manufacture of vaccines or drugs. As described in table 4.31, (50%) of health providers removed the needle from the rubber cap of each multi dose-vial after withdrawing each dose for administration, this result is higher than the result reported by Garapati & Peethala (2014), which found (21.5%) of health providers were leaving the needle to draw additional doses of medicine or vaccine. In our study we observed all health providers did not use of small gauze pad to protect fingers when breaking the top from the glass ampoule and (92.5%) of them reported that their fingers did not touch the needle, these results are different from the results conducted in different studies, in a study conducted by Gyawali (2015), which observed (41.9%) of health providers used small gauze pad to protect fingers when breaking the top from the glass ampoule for injection, in a study conducted by Abker (2013), (63.2%) of participants did not touch the needles during injection. 25% of health providers in our study recapped needles by using two hands, this result is better than the result conducted by Kahissay (2015) in Ethiopia, which found in all health facilities there was no recapping practice seen during observation (Kahissay et al., 2015). Also we observed in our study in all health facilities vaccines vial is kept between +2/+8°C during injection preparation and administration, after the procedure, all health providers used a clean gauze pad and gently apply pressure to the puncture site to stop bleeding, if a hematoma developed during a procedure all health providers terminate the procedure and apply pressure on hematoma and all health providers transferred blood from a syringe/needle into a vacuum tube by inserting the needle directly into the tube, she/he uses a two-handed transfer technique. These results are higher than the results conducted by Kahissay (2015) in Ethiopia, which observed in (77.8%) cases, vials of heat sensitive vaccines were kept between +2/+8°C and (89%) of health providers gently apply pressure to the puncture site to stop bleeding.

Table 4.31: Percentage of availability of disposable material observations classified by the site inside the clinic

Disposable material observed	Injection room		Vaccination room		Dental room		Laboratory	
	Category	%	Category	%	Category	%	Category	%
Type of syringes	2, 3,5ml	20%	0.5ml	20%	Dental syringes	100%	2,3,5ml	70%
	1, 2, 3, 5, 10ml	20%	0.5, 1, 2, 3, 5ml	20%				
	1, 2, 3, 5ml	50%	BCG, 0.5, 1, 2, 3, 5ml	20%			2,3,5,10ml	30%
	2, 3, 5, 10ml	10%	BCG, 0.5ml	20%				
			0.5, 2ml	20%				
Size of needles	21, 22G	20%	23G	20%	27G	40%	21,22G	30%
	21,22,23,25G	60%	21,22,23,25G	40%			21,22,23,25G	50%
	21,24G	20%	23,25G	20%	27,30G	60%	21,22,24,25G	10%
			23,27G	20%			21,24G	10%
Gloves used	New gloves used	0	0		100%		0	
	Gloves not changed	10%	0		0		10%	
	No gloves used	90%	100%		0		90%	
Safety box in each area of health center	Yes	100%	100		100%		100%	
	NO	0	0		0		0	

As illustrated in table 4.31, which shown (1, 2, 3, 5ml) syringes volumes were available in 50% of injection rooms, (BCG, 0.5, 1, 2, 3ml) syringes volumes were available in 20% of vaccination rooms, dental syringes were available in 100% of dental rooms and (2, 3, 5ml) syringes volumes were available in 70% of laboratories in PHCCS. These results are lower than the results produced by Ismail (2014) in Saudi Arabia, which observed (97%) from all syringes volumes were available in rural and urban area in Jazan governorate (Ismail et al., 2014). As shown in the same table we observed (21, 22, 23, 25G) needles sizes were available in 60% of injection rooms, (21, 22, 23, 25G) needles sizes were available in 40% of vaccination rooms, 60% of (27, 30G) needles sizes were available in dental rooms and

(21, 22, 23, 25G) needles sizes were available in 50% of laboratories in PHCCs. These results are lower than the results produced by Kihassy (2105) in Ethiopia, which showed 88% of (21, 22, 23, 24, 27, 30G) needles sizes were available in health care centers (Kihassy et al., 2015). The percentage of using a new pair of gloves for every injection was 25% in PHCCs; this result is lower than the result conducted by Ismail (2014) in Saudi Arabia, which observed the percentage of using a new pair of gloves for every injection was 80.0% in Jazan. Availability of safety boxes in PHCCs 100% in all departments where injections are given. This result is nearly similar to a result conducted by Kihassy (2105) in Ethiopia, which observed almost all health facilities had sufficient puncture proof safety boxes in stock and in areas where injections are given, while this result is better than result conducted by MOH in Senegal (2005), which observed access to safety boxes increased by almost 90% (MOH, Senegal, 2005).

Table 4.32: Percentage of waste collection and disposal profile observations classified by the site inside the clinic

Waste collection and disposal profile	Injection room	Vaccination room	Dental room	Laboratory	Total percentage
Collection of sharps complete with syringe in safety box after the injection	100%	100%	100%	100%	100%
Presence of syringes and needles in other container except safety box	0	20%	30%	0	12.5%
Presence of overflowing pierced or open safety box	60%	30%	10%	60%	40%
Filled safety boxes kept in a secure place	100%	100%	100%	100%	100%
Evidence of used sharps or syringes around the part in clinic	0	0	0	0	0
Evidence of nuisance caused by waste disposal	10%	0	40%	30%	22.5%

As emphasized in table 4.32, which shown all health facilities collected of sharps and syringe in safety boxes after the injection practice, this result is better than the result conducted by Yakob in South West Ethiopia (2015), which observed (79.2%) of health care workers disposed sharp materials and syringes in safety boxes after injection (Yakob et al., 2015). In our study we observed (12.5%) of syringes and needles found in other containers rather than safety boxes, this result is lower than a result conducted by Mahfouz in south-western Saudi Arabia (2009), which observed (69.8%) of health care workers disposed used syringes and needle in safety boxes and (30.2%) of used needles and

syringes disposed in other containers (Mahfouz et al., 2009). As described in table 4.33, which found (40%) of overflowing pierced or open safety boxes in health care facilities, this result is higher than the result conducted by Esena in Ghana (2013), which observed there was no overflowing pierced or open safety boxes in health care centers (Esena et al., 2013). 100% filled safety boxes are kept in a secure place, no evidence of used sharps or syringes around different rooms in PHCCs and (22.5%) evidence of nuisance caused by waste disposal in our study, these results are better than the results conducted by Gyawali in Western Nepal (2015), which observed (8.7%) of sharp scattered around departments of healthcare facilities and study conducted by Bolarinwal in Nigeria (2012), which observed (80%) of nuisance caused by used needles found outside safety boxes in health facilities (Bolarinwal et al., 2012). During observation checklist of the waste disposal sites in Nasser hospital, where it's disposal site of medical wastes result from PHCCs in Mid zone, Khan Younis and Rafah governorates, and Chifa hospital, where it's disposal site of medical wastes result from PHCCs in North and Gaza governorates. I observed that the used needles, syringes and open safety boxes around destruction site of medical waste are stored and incinerated in hospitals, but there are no emission control or safety measures, in addition there are some gaps in knowledge of health care workers. The current practices are inadequate and the operation of incinerators in these hospitals are un acceptable because of the emissions of smoke and smells which affect health and the environment of the area, this result is similar to the result conducted by Sarsour (2014) in GS, which showed lack of incinerators and low quality of operation and improper treatment of hazardous hospital waste (Sarsour et al., 2014).

Chapter V

Conclusion and Recommendations

This chapter provides the main conclusions of this study as well as recommendations for decision makers that help to improve knowledge and practices of injection safety among health providers.

5.1 Conclusion

Injections are one of the most common health care procedures. Injection safety is defined as an injection that does not harm the recipient, does not expose the health workers to any avoidable risk and does not result in waste that is dangerous for the community. The unsafe injection practices are responsible for millions of cases of Hepatitis B, Hepatitis C and HIV annually. Injection safety practices in the health care institutions are a reflection of the quality of supervision, resource allocation and provision of technical support. Therefore the need to update the records on injection safety practices in the health care institutions in the district through periodic assessment. Results from this study will be used to inform policy formulation and implementation for strengthening the capacity of facilities in ensuring good injection safety practice.

This cross sectional study was carried out to assess of injection safety in PHC centers in the GS to raise recommendations that could be helpful for decision makers to improve gaps if found. The study sample was probability proportional sampling from each governorate, central MOH and UNRWA centers were selected, and cluster sampling from health care providers PHCCs were taken, observation checklist of 10 PHCCs in the GS and in depth interview with Key informants in MOH and UNRWA. The response rate was 100% of the total sample.

An important finding of this study is the overall knowledge score of injection safety among health providers in PHCCs was 52.2% and the overall attitude and practices score on key issues of injection safety among health providers in PHCCs was 42%. During observation checklist, important finding is breaking in infection control practices among health providers, poor health care workers protection, and the absence of a proper waste management infrastructure. During in-depth interview with key informants, all of MOH team emphasized that no written protocols or guidelines at MOH health facilities, in the other hand all UNRWA team insist that hard and soft copy protocols and guidelines are available and updated in 2010. 90% of key informants defined injection safety according to

WHO, which is: "Safe injection is an injection that does not harm the recipient, does not expose the health worker to any risk and does not result in waste that puts the community in risk".

According to the results of the study, there was statistically significantly association between knowledge score of injection safety and participants by health facility (P value = 0.00), it was among health providers in UNRWA more than among health providers in MOH, during in depth interview with key informants five out of six said that it's due to continuous training and follow up, five out of six said that it's due to continuous supervision, four out of six said that it's due to clear guidelines and protocols, One from MOH and another from UNRWA said that it's due to commitment and accountability among UNRWA health workers more than MOH health workers. From the study finding, the level of knowledge of injection safety among diploma certificates is higher than other certificates, and these differences reached a statistically significant level (P value = 0.021).

The current study also investigates the relationship between knowledge of injection safety and job title, this relationship was highly statistically significant (P value < 0.01), according to mean knowledge of injection safety among head nurses, SMO and nurses is higher than knowledge of injection safety among others job titles. During in depth interview key informants pointed the accumulative experience of head nurses due to attendance of several workshops and seminars of injection safety and two of them said that it's due to the main cause that the role of head nurse is to supervise others, so she supposed to be more knowledgeable A statistically significant difference (P value = 0.009) appeared when comparing the means of percentage of knowledge score among GGs, the mean of percentage of knowledge score for health providers in south governorates was higher than for health providers in other governorates. During in depth interview one from MOH and two from UNRWA said that it's due to less population density in the south governorate and less work over load, one mentioned that because of the HWs have more commitment to the work and due to continuous supervision and two said that they have no explanation.

A statistically significant difference (P value = 0.002, 0.004 respectively) appeared between knowledge and different variables of practice score of injection safety as training regarding injection safety and vaccinated against hepatitis, the relationship between knowledge of injection safety and kind of protective equipment was statistically significant (P value = 0.005), Post hoc test shows that the main statistical significant was reported among two categories health providers answered two questions from five questions about

knowledge and health providers answered all questions about knowledge (P value = 0.017). The researcher observed differences between knowledge score of injection safety and methods used to deal with safety boxes after filling did not reach to statistical significance (F = 2.095 and P value = 0.626). A highly statistically significant differences (P value = 0.002) appeared between vaccinated against hepatitis B and health facility. Chi Square test reveals that the highest prevalence rate of health providers vaccinated against hepatitis B in UNRWA health centers (96.1%). A highly statistically significant differences (P value = 0.00, 0.002 respectively) appeared between accidental of NSI in last year and, vaccinated against hepatitis B and education level. Chi Square test shows that the prevalence rate of accidental of NSI in last year among health providers have diploma certificate (37.7%) and the least prevalence was among master and PHD degree (31.6%) in the same time the prevalence of vaccinated against hepatitis B among health providers have master and PHD degree were (96.5%), followed by prevalence rate among bachelors certificates (92.8%) and the least prevalence rate among diploma certificate (90.9%).

During observation checklist the researcher observed the office staff who disposed the bio-medical wastes without taking any safety measures. Moreover, none of these staff had received any formal training in waste management but during in dept interview half of key informants said designated staff that handles healthcare waste received training in waste management and other half mentioned that they did not receive training. Improper infection control practices among health providers and poor health care workers protection. All health care workers did not wash their hands by soap and water or cleaned them by alcohol before or after giving injection and the researcher observed 40% of overflowing pierced or open safety boxes in all health facilities. In all health facilities no reminder or job aid for injection safety and 50% of health providers removed the needle from the rubber cap of each multi dose-vial after withdrawing each dose for administration.

In this study there are different gaps in injection safety at primary health care centers in the Gaza Strip, all gaps can be bridge through regular and on job training, supported by Information Education and Communication programs. There is need for periodic injection safety assessment in all health facilities by the relevant stake holders.

5.2 Recommendations

5.2.1 General Recommendation

1. Strengthening implementing rules and regulations on injection safety and proper waste management among health providers to be complied with international standards and put reminders and/or job aids posted that promote reducing the use of injections, safe administration of injections or safe disposal of used injection equipment at health facilities.

2. Continuing education and training programmes for primary health care workers especially physicians and nurses are recommended to keep them up-to-date and aware of new safe injection policies, practices and procedures to minimize some of the risky behaviors.

3. Training on infection control on safe injections including hand hygiene, proper use of multi dose vials, use of gloves as needed and proper disposal of sharps and non-sharps waste after injection procedure.

4. Increasing awareness through training on risk reduction of needle stick injury by not recapping.

5. Support availability of trained designated staff to deal with medical wastes in all health facilities.

6. Provision of supplies for all kinds of protective equipment used to deal with medical wastes within all health facilities.

7. Increase attention towards policies for the proper management and disposal of wastes to ensure enhancement and adequacy in the medical waste management practices.

5.2.2 Recommendation for MOH

1. Efforts to Improve Injection Safety through Collaborations with UNRWA

2. Continuing education and training programmes for primary health care workers to improve knowledge of injection safety between health care workers.

3. The key informants must have supportive supervision of PHCWs on proper usage of available injection equipment by the health departments and review the waste disposal system of the health facilities.

4. Improve vaccination programmes of health care workers against hepatitis B

5.2.3 Recommendation for UNRWA

1. Use aseptic technique to avoid contamination of sterile injection equipment.
2. Do not keep multi dose vials in the immediate patient treatment area and store in accordance with the manufacturer's recommendations; discard if sterility is compromised or questionable.
3. If multi dose vials must be used, both the needle or cannula and syringe used to access the multi dose vial must be sterile.

5.2.4 Recommendation for New Areas of Research

1. Future studies should be carried out for assessment of injection safety on a large sample to include hospitals, private health centers and private pharmacies in GS.
2. More studies need for periodic injection safety assessment in all health facilities by the relevant stake holders.

References

Abdul Aziz, Esena R, Gborgbortsi W, (2013). Assessment of Injection Safety Practices In Health Facilities In Bongo And Talensi Districts In The Upper East Region Of Ghana. INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH VOLUME 2, PP: 2277-8616.

Abdulla F, Qdais HA, Rabi A, (2008). Site investigation on medical waste management practices in northern Jordan. Waste Manage., 28:450–8.

Abkar M,Wahdana I, Sherif A, Raja Y, (2013). Unsafe injection practices in Hodeidah governorate, Yemen. Journal of Infection and Public Health 252—260.

Acharya A. Priyanka, Khandeker J and Bachani D, (2014). Assessment of Knowledge and Practices regarding Injection Safety and Related Biomedical Waste Management amongst Interns in a Tertiary Care Teaching Hospital, Delhi. International Scholarly Research Notices Volume, Article ID 670861, 5 pages.

Ahmed I, Barua J , Imtiaz K, Eusufzai S, Mustafa M, Haque M, Jamayet N, (2013). Infection Control Measures in Some Selected Private Dental Clinics of Dhaka City. Available from file:///C:/Users/Muhammad/Downloads/20252-72488-1-PB.pdf. Accessed at 26 June 2016.

Akum F (2014), An Assessment of Medical Waste Management in Bawku Presbyterian Hospital of the Upper East Region of Ghana. Merit Research Journal of Environmental Science and Toxicology Vol. 2(2) pp. 027-038.

El jedi A & Dalo sh, (2014). Compliance with the National Palestinian Infection Prevention and Control Protocol at Governmental Paediatric Hospitals in Gaza Governorates. Sultan Qaboos Univ Medical Journal. Aug; 14(3): e375–e381.

Ananth A, Prashanthini V, Visvanathan C, (2010). Healthcare waste management in Asia. Waste Manage., 30: 154-161.

Annual epideriological report, (2014) General directorate of primary health Care, preventive medicine – epidemiology Department.

Astal Z and Dhair M, (2004). Serological evaluation for hepatitis Band C among health care workers in southern Gaza Strip. Journal of Islamic university of Gaza, (Natural sciences series) Vol. 12, No. 1, PP, 153-164.

Bdour A, Altrabsheh B, Hadadin N, Al-Shareif M (2006). Assessment of medical wastes management practice: a case study of the northern part of Jordan. Waste Manage., 27(6): 746–59.

Bennett S, Woods T, Liyanage WM, Smith DL. A simplified general method for clustersample surveys of health in developing countries. World Health Statistics Quarterly 1991; 44: 98- 106.

Bhattarai MD, Wittet S, (2000). Perception about injections and private sector injection practices in central Nepal. General Welfare Pratisthan and Gates Children' vaccineProgrammeaPATH.Availablefrom:http://www.path.org/vaccineresources/files/Nepal-Inject-Practices-RA.pdf .Accessed 1October 2015.

Bolarinwal O, Salaudeen A, Aderibigbe S, Musa O, Akande T, Bamidele J, (2012). Injection safety practices among primary health care workers in Ilorin, kwara state of Nigeria. Department of Health Information Management University of Ilorin, Volume 6, Issue 3.

Brokensha G, (1999). Inappropriate injection in practice. Aust Prescr, 22:145–7.

Burns N, & Grove S.K, (2003). Understand nursing research, 3rd ed. Philadelphia: W.B. Saunders.

CDC, (2013). Safe Injection Practices Coalition. Atlanta, GA: US Department of Health and Human Services, Available at http://www. oneandonlycampaign.org/ about/the-campaign.Accessed 17 September 2015.

Centers for Disease Control and Prevention, (2010). "Hepatitis C Information for Health Professionals," Division of Viral Hepatitis http://www.cdc.gov/hepatitis /HCV/HCV faq.htm #section1 ; Accessed 3 March 2016.

Chowdhury AK, Roy T, Faroque AB, Bachar SC, Asaduzzaman M, Nasrin N, et al., (2011). A comprehensive situation assessment of injection practices in primary health care hospitals in Bangladesh. BMC Public Health, 11:779.

Department for International Development (DFID) (2014). Operational Plan 2011- 2015 DFID Palestinian Program, June 2014.

Dounias G, Kypraiou E, Rachiotis G, Tsovili E, Kostopoulos S (2005). Prevalence of hepatitis B virus markers in municipal solid waste workers in Keratsini (Greece). Occup Med., 55(1): 60- 63.

Drucker E, Alcabes PG, Marx PA, (2001). Massive unsterile injections and the emergence of human pathogens. Lancet, 358:1989–92.

Dvaladze G, (2014). Health situation in the Gaza Strip, available from http://www.btselem.org/gaza_strip/medical_system accessed at 12 April 2016

Eljedi A & Dalou SH, (2014). Compliance with the National Palestinian Infection Prevention and Control Protocol at Governmental Paediatric Hospitals in Gaza Governorates. Sultan Qaboos Univ Med J; 14(3): e375–e381.

El- Khateeb D, (2014). Assessment of quality assurance system at the laboratories services in the Gaza Strip. Master thesis, Al-Quds University, SOPH.

Enwere O & Diwe K, (2014). Knowledge, perception and practice of injection safety and healthcare waste management among teaching hospital staff in south east Nigeria. Pan Afr Med Journal; Page: 17- 218.

Esena R, Abdul Aziz A, Gborgbortsi W, (2013). Assessment of Injection Safety Practices in Health Facilities in Bongo and Talensi Districts in The Upper East Region Of Ghana. International journal of scientific and technology research volume 2: ISSN 2277-8616.

Ezzati M, Lopez AD, Rodgers A. (2002). Selected major risk factors and global and regional burden of disease. Lancet, 360: 1347- 60.

Fayaz S, Higuchi M, Hirosawa T, Abul Bashar M, Djabbarova Z , Hamajima N, (2014). Knowledge and practice of universal precautions among health care workers in four national hospitals in Kabul, Afghanistan. Jurnal Infect Dev Ctries, 4(8):535-542.

Final report from USAID, (2009). EVALUATION OF INJECTION SAFETY AND HEALTH CARE WASTE MANAGEMENT IN ETHIOPIA. USAID from American people.

Fink A, (1995). How to measure survey reliability and validity. Seven ed. Thousand Oaks, CA: Sage.

Felicia N, Sally M, Luke C, (2008). Hospital solid waste management practices in Limpopo Province. Waste Management 28 (2008) 1236– 1245.

Franka E, El-Zoka A, Hussein A, Elbakosh M, Arafa K, Ghenghesh S, (2009). Hepatitis B virus and hepatitis C virus in medical waste handlers in Tripoli, Libya. Journal of Hospital Infection., 72: 258-261.

Gadzama G, Bawa S, Ajinoma Z, Saidu M, Umar A, (2014). Injection safety practices in a main referral hospital in northeastern Nigeria. G B Gadzama Department of Microbiology, University of Maiduguri Nigeria Volume: 17, Issue: 2, Page: 134-139.

Ganesh SH, Raghunath N and Balaji SH, (2015). Assessment of safe injection practices and disposal methods among nursing personnel at health care centres of Hoskote - Rural Bengaluru, India. The Oxford Dental College and Hospital, 13(4) P: 475-478.

Garapati S, Peethala S, (2014). Assessment of knowledge and practices on injection safety among service providers in east Godavari district of Andhra Pradesh. India journal Comm Health 26 (3):259-263.

Guh AY, Thompson ND, Schaefer MK, Patel PR, Perz JF. (2012). Patient notification for blood borne pathogen testing due to unsafe injection practices in the US health care settings, Med Care 50: 785- 91.

Gyawali S, Rathore D, Shankar P, Kumar V, Nisha J, Sharma D, (2015). Knowledge and Practice on Injection Safety among Primary Health Care Workers in Kaski District, Western Nepal. Malays J Med Sci.; 23(1): 44-55.

Gyawali S, Rathore DS, Shankar PR, (2013). Study of status of safe injection practice and knowledge regarding injection safety among primary health care workers in Baglung district, western Nepal. BMC Int Health Hum Rights;13:3.

Gaza Situation Report 147, (2016). REPORT from United Nation Relief and Works Agency for Palestine Refugees in the Near East

Hamdan, L, Zarei M, Chianelli R, and Gasdner E, (2008). Sustainable water and energy in Gaza Strip. Elsevies 33 (6): 1137- 1146.

Hauri A, (2004). "The global burden of disease attributable to contaminated injections given in health care settings," International Journal of STD & AIDS Vol. 15; 7-16. HEALTH CARE WASTE MANAGEMENT IN ETHIOPIA. USAID from American people.

Holm K & Liewellyn J, (1986). Nursing research for nursing practice. W.B. Sounders Company. Philadelphia.

Hutin YJ, Hauri AM, Armstrong GL. (2003). Use of injections in health care settings worldwide, Literature review and regional estimates Immunization Essentials Practical field Guide. BMJ. 327: 1075-8A.

Initial Health Assessment Report (IHAR) Gaza Strip, (2012). World Health Organization Office of the occupied Palestinian territory. Website: http://www.emro.who.int/palestine.

International labour Office (ILO), Geneva, (2010). Women in labour markets: Measuring progress and identifying challenges. Accessed at http://www.ifrro.org. Accessed on 25th May 2011.

Ismail A, Mahfouz M, Makeen A, (2014). Injection Safety among Primary Health Care. Community Medicine Department, Faculty of Medicine, Jazan University, PO Box 2531, Jazan.

Ismail N, Aboul ftouh A, El shoubary W and Mahaba H, (2007). Safe injection practices among health care workers in Gharbiya Governorate, Egypt. Eastern Mediterranean journal Vol. 13 No. 4.

Jahangiri M, Rostamabadi A, Hoboubi N, Tadayon N and Soleimani A, (2015). Needle Stick Injuries and their Related Safety Measures among Nurses in a University Hospital, Shiraz, Iran. Occupational Safety and Health Research Institute. Published by Elsevier, 7(1): 72–77.

Janua, N, (2005). Injection Use in Two Districts of Pakistan: Implications for Disease Prevention," International Journal for Quality in Health Care Vol. 17 No. 5; 401-408.

Kahissay M, Gedif T, Engedawork E and Mariam T, (2015). Assessment of health care providers injection practices in dessie district, North-Eastern Ethiopia. Department of pharmacology, school of pharmacy, collage of health sciences, Addis ababa university, 10(2) P:4572-6345.

Kane A, Lloyd J, Zaffran M, Simonsen L and Kane M, (1999). Transmission of hepatitis B, hepatitis C and human immunodeficiency viruses through unsafe injections in the developing world: model-based regional estimates. Bulletin of the World Health Organization, 77, 801–807.

Kaseva, M.E., Mato, R.R.A.M. (1999). Critical review of industrial and medical waste practices in Dar es Salaam City. Waste Management, 25, 271–287.

Kermode M, Holmes W, Langkham B, Thomas MS, Gifford S, (2005) Safer injections, fewer infections: Injection safety in rural north India. Trop Med Int Health, 10:423–32.

Kermode,M, (2004). Unsafe injections in low-income country health settings: need for injection safety promotion to prevent the spread of blood-borne viruses. Health

Promotion International Vol. 19 No. 1 http://heapro.oxfordjournals.org/content/19/1/95.full.pdf+html

Khala A (2009). Assessment of Medical Waste Management in Jenin District Hospitals MSc. Thesis, An-Najah National University, Palestine.

Khurram M, Ijaz K, Bushra TH, Khan YN, Bhushra H, Hussain W, (2012). Needle stick injuries: A survey of doctors working at tertiary care hospitals of Rawalpindi. J Pak Med Assoc, 61:63–5.

Kitenah M & Hamdan M, (2012). Workplace violence against physicians and nurses in Palestinian public hospitals. BMC Health Services Research BMC series: 10.1186/1472 6963-12-469.

Last M, (1983). Dictionary of epidemiology. New York: oxford University Press.

Lipchin, C. (2007). Integrated water resources management and security in the middle east. Spring.

Mahfouz A, Abdelmoneim M, Khan A, Daffalla M, Diab H, Shaban H and Al Amri S. (2009). Injection safety at primary health care level in south-western Saudi Arabia. Eastern Mediterranean Health Journal, Vol. 15, No. 2,

Mantel C, Khamassi S, Baradel K, Nasri H, Mohsni E, Duclos P, (2007). Improved safety after targeted interventions in the Syrian Arab Republic. Trop Med Int Health, 12:422–30.

Massrouji M (2001). Medical waste and health workers in Gaza governorates. East Mediterr Health J., 7: 1017-24.

McDaniel C. & Gates R, (2010). Marketing Research Essential. 7th ed. United states of America: John Wiley and Sons Wisker.

Michelle K, (2004). Healthcare worker safety is a pre-requisite for injection safety in developing countries. Int J Infect Dis, 8:325–7.

Miller MA, Pisani E, (1999). The cost of unsafe injection. Bull World Health Organ, 77: 808-11.

Ministry of Health, Senegal, (2005). Knowledge and Practices of Injection Safety in DevelopingCountry.Availablefromhttp://www2.sante.gouv.sn/IMG/pdf/enquetesecuriteinjections.pdf Accessed at 4 July 2016.

MOH, (2013). National health strategy. 2011- 2013. setting direction- getting results, MOH.

Mohee R, (2005). Medical wastes characterization in healthcare institutions in Mauritius. Waste Manage., 25:575-81.

Mujeeb S, (2003). "Recycling of Injection Equipment in Pakistan," Infection Control and Hospital Epidemiology Vol. 24 No. 2; 145-146.

Murad A, (2010). Evaluation of Medical Equipment Management in Governmental Health Facilities in Gaza Governorates. Al-Qudus University, SOP.

Nakarmi M, Thakuri S, Stringer R, (2010). Injection safety in Nepal.World Health Organization, http://who.int/injection_safety/sign/en/. In Report on Annual Meeting of the Safe Injection Global Network, 9-11 November 2010, Dubai, United Arab Emirateshttp://who.int/injection_safety/toolbox/sign2010_meeting.pdf] accessed 18 April. 2016.

Nsubuga F & Jaakkola, M, (2005). "Needle stick injuries among nurses in sub-Saharan Africa," Tropical Medicine and International Health Vol. 10 No. 8; 773-781.

Okwen.M, (2011). "Uncovering high rates of unsafe injection equipment reuse in rural Cameroon: validation of a survey instrument that probes for specific misconceptions," Harm Reduction Journal Vol. 8 No. 4.

Omorogbe V, Omuemu V, Isara A, (2012). Injection safety practices among nursing staff of mission hospitals in Benin City, Nigeria. Annals of African Medicine, Vol. 11, No. 1, January-March, pp. 36-41.

Onyemocho A, Anekoson J and Pius E, (2013). Knowledge and Practice of Injection Safety among Workers of Nigerian Prison Service Health Facilities in Kaduna State. American Journal of Public Health Research, pp 171-176.

Palestinian public hospitals. BMC Health Services Research BMC series 12:469 DOI: 10.1186/1472-6963-12-469.

PCBS (2014). Palestinian Chidren – Issues and statistics No (11).

PCBS, (2013) http://www.pcbs.gov.ps/portals/-PCBS/downloads book 2032. pdf, accessed 20 October 2015).

Pennsylvania Patient Safety Authority, (2011). "Pennsylvania Patient Safety Advisory," ECRI Institute and ISMP Vol. 8 No.2.

Pepin J, Abou Chakra CN, Pepin E, Nault V, Valiquette L, (2014). Evolution of the global burden of viral infections from unsafe medical injections, 2000-2010. PLoSOne. Vol. 9; 9(6): 99677.

Perz Joseph F, Thompson Nicola D, Schaefer Melissak K, Patel Priti R. (2010). US outbreak investigation highlight the need for safe injection practices and basic infection control. Clinic in liver disease, 14 (1): 137- 51.

Polit D & Beck T, (2004). Nursing research. Principles and Methods. Seventh ed. Lippincontt Williams and Wilkins, new York, USA.

Pugliese G, (2010). "Injection Practices Among Clinicians in US Health Care Systems," American Journal of Infection Control Vol. 38 No. 10: 789-798.

Raglow G, Luby S, Nabi N, (2006). Therapeutic Injections in Pakistan: from the Patients Perspective. Department of Community Health Sciences, Aga Khan University, Karachi, Pakistan. Available from http://jpma.org.pk/supplement_details.php?article_id=9. Accessed at 2 June 2016.

Reeler AV, (2000). Anthropological perspectives on injections. Bull World Health Organ, 78:135–43.

Reeler AV, Hematorn C, (1994).World Health Organization. Injection practices: A case study of Thailand, publication NO. WHO/DAP/94.8. Geneva.

Riaz H, Kamal SW, Riaz T, Aziz S, Rajper J, Noorulain W, (2012). Methods of disposal of used syringes by Hepatitis B and C patients at an urban and rural setting. Available from:http://jpma.org.pk/full_article_text.php?article id=3241. Accessed at 2 October 2015.

Saleh, M. M. (Ed). (2012). The Palestinian Strategic Report 2010/2011. AlZaytouna center for Studies and Consultations http://www.alzaytouna.net/english/publication/PSR/0-11/Full.pdf.

Sarsour A, Ayoub A , Lubbad I , Omran A , Shahrour I, (2014). Assessment of Medical Waste Management within Selected Hospitals in Gaza Strip Palestine, International Journal of Scientific Research in Environmental Sciences, 2 (5), pp. 164-173.

Sciortino, R, (1993). The myth of injections: providers and patients in rural Central Java. In Wolffers, I. and Bloem, M. (eds) *The Impact of Injections on Daily Medical Practice*. VU University Press, Amsterdam.

Shiferaw Y, Abebe T, Mihret A, (2012). Sharps injuries and exposure to blood and bloodstained body fluids involving medical waste handlers. Waste Manage., 30: 1299-1305.

Simonsen L, Kane A, Lloyd J, Zaffran M, Kane M, (1999). Unsafe injections in the developing world and transmission of blood borne pathogen. Bull World Health Organ, 77:789–800.

Strickland R, (2006). Mother – to- infant transmission of hepatitis c virus. Lancet, 345: 289-291.

Taghipour H, Mosaferi M, (2009). Characterization of medical waste from hospitals in Tabriz, Iran. Science of the Total Environment, 407:1527- 1535.

Tarantola, A, (2005). “A Descriptive, Retrospective Study of 567 Accidental Blood Exposures in Healthcare Workers in three West African Countries,” Journal of Hospital Injection Vol. 60 No. 3; 276-282.

Tertiary Health Institution in South Southern Nigeria. IOSR Journal of Dental and Medical UNDP (2012). Gaza Facts Sheet Available at: http://www.undp.ps/en/newsroom /publications/pdf/other/GazaFactSheet 2012. pdf (Accessed 28 September 2015).

United Nations Relief and Works Agency (UNRWA) Operational Response, 2013. Available at: http://www.unrwa.org/userfiles/2013 pdf (Accessed November 2015).

United States Environmental Protection Agency (USEPA). Available from: https://www.epa.gov/rcra/medical-waste, (accessed July 2016). Vol 5, No 3.

Vong S, (2005). Rapid assessment of Injection Practices in Cambodia. Bio Med Central Public Health Vol. 5; 1471-1476.

Wilburn, Susan & Gerry Eijkemans, (2004). “Preventing Needlestick Injuries among Healthcare Workers: A WHO-ICN Collaboration,” INT J OCCUP ENVIRON HEALTH Vol. 10 No. 4; 451-456.

Wisker G, (2001). The postgraduate research handbook: Succeed with your MA, MPhil, Ed and phD. New York: Palgrave McMillan.Workers in Jazan Region, Saudi Arabia. Medical Research Centre, Jazan University.

World Health Organization, (1999). “Safety of Injections,” WHO/EPI/LHIS/97.04 Rev. 1.

World Health Organization, (2000). Aide-Memoire for a national strategy for health-care waste management. World Health Organization, “WHO core principles for achieving safe and sustainable management of health-care waste,” International Health Care Waste Meeting WHO/SDE/WSH/07.10 (June 20-22, 2007).

World Health Organization, (2001). "Revised Injection Safety Assessment Tool (Tool C – Revised). 20 Avenue Appia, 1211 Geneva 27, Switzerland. Available from

http://www.who.int/injection_safety/Injection_safety_final-web.pdf. Accessed at 25 November 2015.

World Health organization Report, (2002) Reducing Risks, Promoting Healthy life. Available at http://www.who.int/whr/2002/en. Accessed 23 September 2015.

World Health Organization, (2003). Aide-Memoire for a Strategy to Protect Health Workers from Infection with Bloodborne Viruses. Available from http://apps.who.int/iris/bitstream/10665/154588/1/9789241508476_eng.pdf . Accessed at 1 May 2015.

World Health Organization, (2008). Publication No. WHO/EHT/08.08. Geneva. Revised injection assessment tool (tool C- revised) Available from: http://www.who.int /injection_safety/Injection_safety_final-web.pdf. Accessed 5October 2015

World Health Organization, (2009). "Annual Meeting of the Safe Injection Global Network," SIGN.

World Health Organization, (2010a). Global Programme for vaccination and immunization. Geneva. Available from, http://who.int/injection_safety/sign/en/webciteAccessed at 26 September 2015.

World health organization, (2010b). Country cooperation strategy for WHO and the occupied Palestine Territory 2009-2013.

World Health Organization, (2011a). Safety of injections Question and Answers. Publication No. WHO/EHT/04.06. Secretariat of the Safe Injection Global Network; Department of Essential Health Technologies. Available from: http://who.int/injection _safety/resources/en/index.html. Accessed 3 October 2015

World Health Organization, (2011b). Global Report: Global Summary of the AIDS Epidemic 2009, http://www.who.int/hiv/data/en/

World Health Organization, (2012a). "Guiding Principles to Ensure Injection Device Security," WHO/BCT/03.12

World Health Organization, (2012b). Programmes and projects. Geneva. The SIGN alliance. Available from:http://who.int/injection_safety/sign/en.html. Accessed 1 October 2015.

World Health Organization, (2015a). Health care waste management. Media center. Available from http://www.who.int/mediacentre/factsheets/fs253/en/ Accessed at 2 may 2016.

World Health Organization, (2015b). Water, sanitation and hygiene in health care facilities Status in low- and middle-income countries and way forward. Available from http://apps.who.int/iris/bitstream/10665/154588/1/9789241508476_eng. Accessed at 22 June 2016.

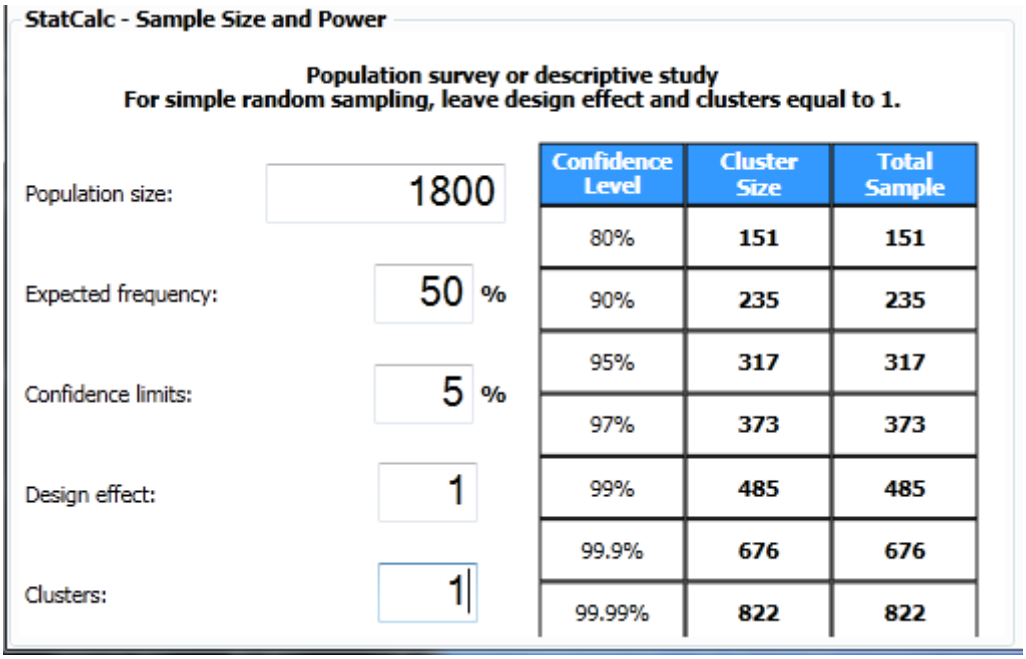
Wyatt H. V and Mahadevan S, (1993). Unnecessary injections in developing countries: risk and costs. International Journal of Risk and Safety in Medicine, 4: 167–176.

Wyatt, H. V. (1986). Injections and AIDS. Tropical Doctor, 16, 97–98.

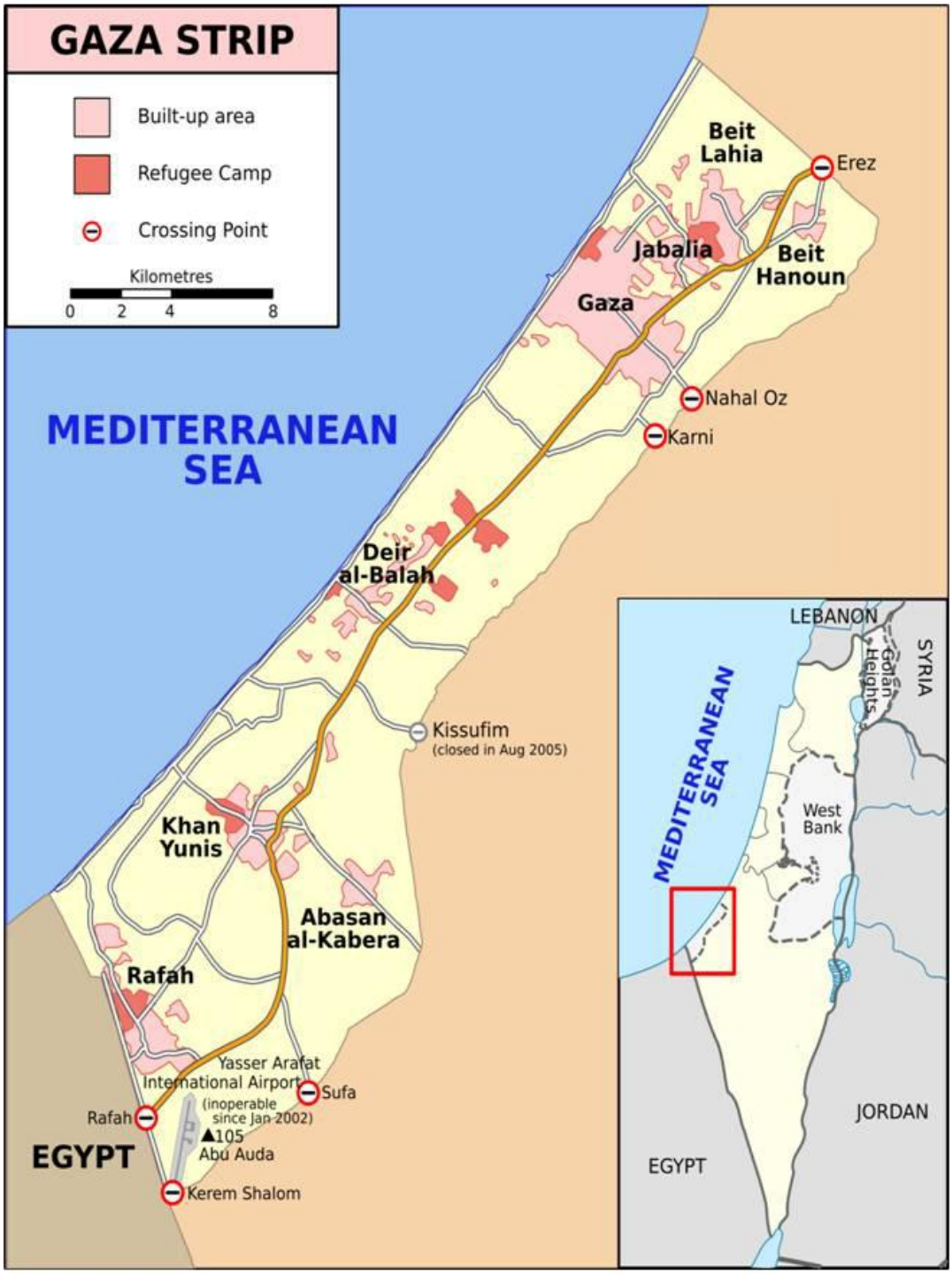
Yacoub R, Al Ali R, Moukeh Gh, Lahdo A, Mouhammad Y and Nasser M, (2010). Hepatitis B Vaccination Status and Needlestick Injuries Among Healthcare Workers in Syria. Journal Glob Infection Diseases. Jan-Apr; 2(1): 28–34.

Yakob E, Lamaro T and Henok A, (2015). Knowledge, Attitude and Practice towards Infection Control Measures among Mizan-Aman General Hospital Workers, South West Ethiopia. Jurnal Community Medical Health Education 5:370. doi:10.4172/2161-0711.

Annex 1: Sample size calculation by using Epi-Info version 7



Annex 2: Gaza Strip Map



Annex 3: Consent Form (Arabic)

نموذج موافقة

تقييم مأمونية الحقن الآمن في مراكز الرعاية الصحية الأولية بمحافظات غزة

الاخوة الزميلات والزملاء:

أود ان احيطكم علما بأنني بصدد عمل دراسة ماجستير حول **تقييم مأمونية الحقن الآمن في مراكز الرعاية الصحية الأولية التابعة لوزارة الصحة ووكالة الغوث بمحافظات غزة** وقد تم اختياركم لتكونوا احد المشاركين في هذه الدراسة.

علما بأن كل المعلومات التي تدلون بها هي معلومات سرية للغاية وستستخدم فقط من اجل البحث العلمي.

نقدر لكم مشاركتكم ونشكركم على التعاون

الباحثة/ ميسون محمود أبوربيع

جامعة القدس أبوديس– كلية الصحة العامة

مسار علم الأوبئة

Annex 4: Self administering Questionnaire

Assessment of Injection Safety in primary Health Care centers – Gaza Governorates

1. Serial Number: **Health facility: _____**

UNRWA ☐ **Government** ☐

2. Research Governorate:

☐ North Gaza ☐ Gaza ☐ Midzone ☐ Khan Younis ☐ Rafah

3. Gender:

☐ Male ☐ Female

4. Age: ____ years

5. Education Level :

☐ Diploma ☐ BA ☐ M.A. ☐ PHD

6. Job title:

☐ Medical health officer ☐ RN ☐ Physician ☐ Dentist ☐ Lab technician ☐ Nurse

7. Years of experience: _____

7.A. Inside Gaza:

☐ Less than 5 years ☐ 5-10 years ☐ More than 10 years

7.B. Outside Gaza:

☐ Less than 5 years ☐ 5-10 years ☐ More than 10 years

8. Do you use needles and syringes for one time only?

☐ Yes ☐ No ☐ Sometimes

9. Do you use any sterile equipment during work related procedure at this facility?

☐ Yes ☐ No ☐ Sometimes

10. Is there an 'injection safety policy used in your health care facility?

☐ Yes ☐ No ☐ Don't Know

11. Is there an 'injection safety guidelines' (or similar) by the Ministry (or other) and used in your health care facility?

☐ Yes ☐ No ☐ Don't Know

12. Is there a 'medical waste disposal policy used in your health care facility?

☐ Yes ☐ No ☐ Don't Know

13. Is there a 'medical waste disposal guidelines' or similar by the Ministry (or other) and used in your health care facility?

☐ Yes ☐ No ☐ Don't Know

14. Is there any education material or counseling for blood and body fluid exposures?

☐ Yes ☐ No

15. Have you had any accidental needle-stick or sharps injuries (with used equipment) in the last years?

☐ Yes ☐ No

15. A. If question 13 yes, how many times? ☐

If No, go to Q17?

16. If you have had any needle-stick or sharps injuries (with used equipment) in the last years, did you report the injury to your supervisor, or whoever is in charge of reports of needle-stick injuries?

☐ Yes ☐ No

If Yes go to Q16.A

If No go to Q17

16.A. If you reported your most recent needle-stick or sharps injury, were you offered counseling?

☐Yes ☐ No

16.B. Do you have any curative medication or any diagnostic procedure after exposure to needle stick?

☐ Yes ☐ No

16.C. If Yes" specify what kind of curative is offered?

……

17. In the last two years, have you received any training regarding injection safety?

☐ Yes ☐ No

18. Would you mention the diseases that are transmitted to health workers by unsafe injections?

……

……

19. Have you ever received the vaccine against Hepatitis B?

☐ Yes ☐ No

19.A. If yes, how many Hepatitis B vaccine doses have you received? ☐

20. In the last six months, is there have been any stock-outs of disposable syringe/needles used for phlebotomy (blood collection) or injection in any of the units that you supervise?

☐ Yes ☐ No ☐ Don't Know

20.A. How long in total were you out of stock?

☐ Less than one month ☐ 1-2 months ☐ 3-6 months ☐ Don't know / don't remember

21. In the last six months, is there have been any stock-outs of safety box used for phlebotomy (blood collection) or injection in any of the units that you supervise?

☐ Yes ☐ No ☐ Don't Know

21.A. How long in total were you out of stock?

☐ Less than one month ☐ 1-2 months ☐ 3-6 months ☐ Don't know / don't remember

22. Which kind of protective equipment is available to those who deal with medical waste?

☐ None ☐ Latex gloves ☐ Sterile gloves ☐ Boots ☐ Mask ☐ Hat ☐ Gown ☐ Overalls

☐ other, specify…….

23. Is there any designated staff who disposes of medical waste?

☐ Yes ☐ No ☐ Don't Know

If Yes answer Q24

if No answer Q25

24. Has the designated staff that handles medical waste received any formal training in waste management?

☐ Yes ☐ No ☐ Don't Know

25. When you run short of injection equipment is there a way to place an emergency order for equipment?

☐ Yes ☐ No ☐ Don't Know

26. Have you placed any emergency orders for injection equipment in the last six months?

☐ Yes ☐ No ☐ Don't Know

If Yes go to Q27

If No answer Q28

27. If you have placed an emergency order for injection equipment, how long did it take for the order to arrive?

☐ Less than a week ☐ 1-2 weeks ☐ More than two weeks ☐ Don't know/don't remember

28. If you have had shortages of injection equipment in the past and there is no protocol for placing an emergency order, how did you deal with that situation?

……

……

29. How do you deal with safety boxes after filling?

☐ Kept in lock secured place till transfer it ☐ Transfer it to nearest hospital ☐ Transfer it to central garbage ☐ Incinerated inside health center ☐ Don't know

Annex 5: Arabic Self administrating Questionnaire

استبيان ذاتي التعبئة

تقييم مأمونية الحقن الآمن في مراكز الرعاية الصحية الأولية بمحافظات غزة

رقم مسلسل: ☐☐☐

1. المركز الصحي:_____

☐ حكومة ☐ وكالة

2. المحافظة

☐ شمال غزة ☐ غزة ☐ الوسطى ☐ خانيونس ☐ رفح

3. الجنس

☐ ذكر ☐ أنثى

4. العمر بالسنوات: _____

5. المستوى التعليمي

☐ دبلوم ☐ بكالوريوس ☐ ماجستير ☐ دكتوراه

6- المسمى الوظيفي

☐ مدير مركز صحي ☐ طبيب ☐ حكيم

☐ طبيب أسنان ☐ فني مختبر ☐ ممرض

7- سنوات الخبرة في العمل في القطاع الصحي

7(أ)- داخل قطاع غزة

☐ أقل من 5 سنوات ☐ 5 إلى 10 سنوات ☐ أكثر من 10 سنوات

7(ب)- خارج قطاع غزة

☐ أقل من 5 سنوات ☐ 5 إلى 10 سنوات ☐ أكثر من 10 سنوات

8- هل تقوم باستعمال المحاقن والابر لمرة واحدة فقط؟

☐ نعم ☐ لا ☐ لا أعرف

9- هل تقوم باستعمال أدوات معقمة أثناء العمل في المركز الصحي؟

☐ نعم ☐ لا ☐ لا أعرف

10- هل يوجد دليل ارشادي حول الحقن الامن في المركز الصحي؟

☐ نعم ☐ لا ☐ لا أعرف

11- هل يوجد تعميم من قبل وزارة الصحة أو مؤسستكم حول الحقن الآمن؟

☐ نعم ☐ لا ☐ لا أعرف

12- هل يوجد دليل إرشادي حول التخلص من النفايات الطبية في مؤسستكم؟

☐ نعم ☐ لا ☐ لا أعرف

13- هل يوجد تعميم من قبل وزارة الصحة أو مؤسستكم حول التخلص من النفايات الطبية؟

☐ نعم ☐ لا ☐ لا أعرف

14- هل يوجد مادة تعليمية أوإرشادات حول التعامل مع مخلفات الدم أو سوائل الجسم المختلفة في مؤسستكم؟

☐ نعم ☐ لا ☐ لا أعرف

15- هل سبق أن تعرضت لوخز بإبرة أو أدوات حادة مستعملة في السنوات الماضية؟

☐ نعم ☐ لا

15(أ)- إذا كانت الاجابة نعم كم مرة تعرضت للوخز؟ _____

15(ب)- إذا كانت الاجابة لا انتقل للسؤال رقم 17

16- إذا تعرضت لوخز بإبرة أو أدوات حادة مستعملة في السنوات الماضية هل بابلاغ رئيسك المباشر أو مدير المؤسسة؟

☐ نعم ☐ لا

إذا كانت الاجابة نعم انتقل للسؤال رقم 16(أ)

إذا كانت الاجابة لا انتقل للسؤال رقم 17

16(أ)- اذا قمت بابلاغ رئيسك المباشر أو مدير المؤسسة هل تلقيت المشورة؟

☐ نعم ☐ لا

16(ب)- في حالة تعرضك لوخز بإبرة أو أدوات حادة مستعملة هل قمت بإخذ علاج وقائي أو تم عمل فحوصات مخبرية لك؟

☐ نعم ☐ لا

16(ج)- إذا كانت الاجابة نعم ما هو نوع العلاج أو الفحوصات المخبرية التي تم اجرائها؟

.....

.....

17- هل تلقيت تدريب حول الحقن الآمن في العامين الماضيين؟

☐ نعم ☐ لا

18- هل لك/ي أن تذكر/ي الأمراض التي من الممكن أن تنتقل عن طريق الحقن الغير آمن؟

.....

.....

19- هل قمت/ي بتلقي تطعيم ضد الالتهاب الكبدي البائي؟

☐ نعم ☐ لا

19(أ)- إذا كانت الاجابة نعم ما هو عدد الجرعات؟

20- في آخر ستة أشهر هل حصل عجز في رصيد المحاقن ، الإبر ، الأدوات الخاصة بجمع عينات الدم أو التي تستخدم في غرفة الحقن أو التطعيمات؟

☐ نعم ☐ لا ☐ لا أعرف

20(أ)- إذا كانت الاجابة نعم ما هي المدة التي حصل فيها عجز؟

☐ أقل من شهر ☐ من شهر الى شهرين ☐ من 3شهور الى 6 شهور ☐ لا أعرف

21- في آخر ستة أشهر هل حصل عجز في رصيد الصناديق الآمنة في غرفة جمع عينات الدم أو غرفة الحقن أو التطعيمات؟

☐ نعم ☐ لا ☐ لا أعرف

21(أ) - إذا كانت الاجابة نعم ما هي المدة التي حصل فيها عجز؟

☐ أقل من شهر ☐ من شهر الى شهرين ☐ من 3شهور الى 6 شهور ☐ لا أعرف

22- ما هي أدوات الحماية المستعملة أثناء التعامل مع المخلفات الطبية؟

☐ لا يوجد أدوات ☐ كفوف بلاستيكية ☐ قناع ☐ طاقية

☐ مريول واقي ☐ كل ما سبق ☐ أشياء أخرى/ حدد.....

23- هل هناك شخص محدد للتعامل مع المخلفات الطبية؟

☐ نعم ☐ لا ☐ لا أعرف

إذا كانت الاجابة نعم انتقل للسؤال رقم 24

إذا كانت الاجابة لا انتقل للسؤال رقم 25

24- هل الشخص المحدد للتعامل مع المخلفات الطبية قد تلقى تدريبا حول طرق التعامل مع المخلفات؟

☐ نعم ☐ لا ☐ لا أعرف

25- عند حصول نقص في الأدوات الخاصة بالحقن هل هناك خطة عاجلة لتعويض النقص؟

☐ نعم ☐ لا ☐ لا أعرف

26- في الستة أشهر الأخيرة، هل قمت بتحرير طلبية عاجلة لتوفير أدوات خاصة بالحقن؟

☐ نعم ☐ لا ☐ لا أعرف

إذا كانت الاجابة نعم انتقل للسؤال رقم 27

إذا كانت الاجابة لا انتقل للسؤال رقم 28

27- عند تحرير طلبية عاجلة لتوفير أدوات خاصة بالحقن ما هي المدة الزمنية اللازمة لتوفرها؟

☐ أقل من أسبوع ☐ من أسبوع الى اسبوعين ☐ أكثر من أسبوعين ☐ لا أعرف

28- في حالة حدوث نقص في أدوات الحقن ولا يوجد هناك أي خطة للتعويض كيف تواجه هذه المشكلة؟

.....

.....

29- كيف يتم التعامل مع الصناديق الآمنة بعد امتلائها؟

☐ تحفظ في مكان مغلق وآمن ☐ ترحل بصورة دورية إلى أقرب مستشفى للحرق

☐ ترحل إلى مكب النفايات الرئيسي ☐ تحرق داخل المركز الصحي ☐ لا أعرف

Annex 6: Observation Checklist

Assessment of Injection Safety in Primary Health Care centers

Gaza Governorates

Serial Number: ☐ ☐

Research Governorate: □North Gaza□Gaza □Midzone □ Khan Younis □ Rafah

Facility Type: _____ Date of facility assessment: _____

	FACILITY OBSERVATION ITEMS	**Please circle "Yes," "No," or "N/A" (Not applicable / not observed) for each item. If an item asks about a type of equipment that is not used at all in the facility, select 'N/A'.**
Q1	Are there any loose disposable needles and syringes inside the facility (for example, outside of packaging and not disposed of in a waste container)?	1. Yes 2. No
Q2	Is there any loose disposable phlebotomy equipment (other than needles and syringes) inside the facility (for example, outside any packaging and not disposed of in a waste container)?	1. Yes 2. No 3. NA
Q3	Is there any loose disposable intravenous infusion equipment inside the facility (for example, outside any packaging and not disposed of in a waste container)?	1. Yes 2. No 3. NA
Q4	Is there any multi-dose vial with a needle left in the diaphragm?	1. Yes 2. No
Q5	Are there used sharps in an open container in any area of the facility?	1. Yes 2. No
Q6	Are there any separate waste containers in each injection area of the facility for each of the following types of waste: sharps, infectious and non-infectious?	1. Yes 2. No

	FACILITY OBSERVATION ITEMS	Please circle "Yes," "No," or "N/A" (Not applicable / not observed) for each item. If an item asks about a type of equipment that is not used at all in the facility, select 'N/A'.
Q7	Is there at least one puncture resistant and leak proof sharps container in all areas where vaccinations are given?	1. Yes 2. No
Q8	Are there any reminders and/or job aids posted that promote reducing the use of injections, safe administration of injections or safe disposal of used injection equipment at this facility?	1. Yes 2. No
Q9	If you answered Q8 "Yes", describe what I saw	1. Yes 2. No
Q10	Are all used sharps containers which waiting final destruction completely closed?	1. Yes 2. No
Q11	Are full sharps containers stored in a locked area or otherwise stored safely away from public access?	1. Yes 2. No
Q12	Are there any used sharps on the ground immediately outside the health facility or around the disposal site?	1. Yes 2. No

	Injection practices observed	Please circle "Yes," "No," or "NA" (Not applicable / not observed) in the designated column. Use a single column below to record all of your observations for a given injection. The goal is to observe ONE injection of each type that is provided in each service unit that is included in the research.				
Q13	Presence of source of clean water (as running water or water vessel with tap)	**Code**	**Injection room**	**Vaccination room**	**Dental room**	**Laboratory**
		1. Yes 2. No 3. NA				
Q14	Presence of soap close to the source of water	1. Yes 2. No				
Q15	Presence of clean hand towel close to the source of water	1. Yes 2. No				
Q16	Availability of bleach or another surface disinfectant in the facility	1. Yes 2. No 3. NA				
Q17	The health provider washed her/his hands before preparing an injection with soap and running water	1. Yes 2. No				
Q18	The health provider cleaned her/his hands before preparing an injection by using alcohol-based hand rub	1. Yes 2. No				
Q19	The injection prepared on a visibly clean, dedicated table or tray where contamination of the equipment with blood, body fluids or dirty swabs is unlikely	1. Yes 2. No				

Q20	The health provider appropriately secured the patient and the intended puncture site so that the patient could not move during the procedure	1. Yes 2. No				
Q21	Types of syringe used for the injection you observed 1. BCG 2. 0.5ml 3. 1ml 4. 2ml/3ml 5. 5ml 6. 10ml 7. Other (specify)	1 2 3 4 5 6 7				
Q22	Size of needle was used for injection you observed 1. 21, 22, 23,24,25,27G 2. Vaccotainers 3. Lancet 4. Butterflies 5. Others (specify)	1 2 3 4 5				
Q23	Safe and enough space for safe injection	1. Yes 2. No 3. NA				
Q24	Sterilization of dental syringes	1. Yes 2. No 3. NA				

Q25	The health provider used a new pair of gloves for safe injection 1. New gloves used 2. Gloves not changed 3. No gloves used	1 2 3				
Q26	Sterile syringe/Lancet packet opened in front of patient	1. Yes 2. No				
Q27	Sterile needle packet opened in front of patient	1. Yes 2. No				
Q28	Preparation of injection/procedure using sterile technique	1. Yes 2. No				
Q29	Preparation of injection: is the volume of dose to be administered correct	1. Yes 2. No				
Q30	Reconstitution of a powdered vaccine or medicine performed by using diluents from the same manufacturer	1. Yes 2. No 3.NA				
Q31	For reconstitution, a syringe and needle each were taken from a sterile unopened packet or fitted with caps	1. Yes 2. No 3. NA				
Q32	The health provider cleaned the rubber cap with antiseptic in multidose vial	1. Yes 2. No				
Q33	The health provider cleaned the rubber cap which previously used swab	1. Yes 2. No				

Q34	The needle removed from the rubber cap of each multidose-vial after withdrawing each dose for administration	1. Yes 2. No				
Q35	Use of clean barrier (as small gauze pad) to protect fingers when breaking the top from the glass ampule	1. Yes 2. No				
Q36	Correct injection technique (fingure not touching the needle, correct site)	1. Yes 2. No				
Q37	The patient's skin cleaned before the injection was given 1. Water 2. Providone-iodine or alcohol 70% 3. Other antiseptic	1 2 3 4 5				
Q38	Needles re-capped	1. Yes 2. No				
Q39	The health provider recap a needle using two hands at any stage of the procedure	1. Yes 2. No				
Q40	Heat of vaccines vial is kept between +2/+8°C during injection preparation and administration	1. Yes 2. No				
Q41	Presence of used swab in work place	1. Yes 2. No				

Q42	After the procedure, the health provider used a clean gauze pad and gently apply pressure to the puncture site to stop bleeding	1. Yes 2. No				
Q43	If a hematoma developed during a procedure the health provider terminate the procedure and apply pressure the hematoma to prevent its expansion	1. Yes 2. No				
Q44	The health provider cleaned the work area with disinfectant after the procedure if there is blood or body fluid contamination	1. Yes 2. No				
Q45	After the procedure, the health provider cleaned her/his hands by washing with soap and clean water or using alcohol-based hand rub	1. Yes 2. No				
Q46	One safety box for each health worker at each location where injection are given	1. Yes 2. No 3. NA				
Q47	Collection of sharps complete with syringe in safety box immediately after the injection	1. Yes 2. No				
Q48	Presence of syringes and needles in other container except safety box	1. Yes 2. No 3. NA				
Q49	Presence of overflowing pierced or open safety box	1. Yes 2. No				

Q50	Filled safety boxes kept in a secure place	1. Yes 2. No				
Q51	Evidence of used sharps or syringes around the clinic	1. Yes 2. No				
Q52	Evidence of nuisance caused by waste disposal	1. Yes 2. No				
Q53	The health provider transferred blood from a syringe/needle into a vacuum tube by inserting the needle directly into the tube, she/he use a two-handed transfer technique	1. Yes 2. No 3. NA				
Q54	Any other sterilization method being used to sterilize devices used for injections, venous phlebotomies or intravenous procedures	1. Yes 2. No If yes, specify method: _____				

Annex 7: Arabic Observation Checklist

تقييم الملاحظة

تقييم مأمونية الحقن الآمن في مراكز الرعاية الصحية الأولية بمحافظات غزة

رقم مسلسل: ☐☐☐

المحافظة :

☐ شمال غزة ☐ غزة ☐ الوسطى ☐ خانيونس ☐ رفح

اسم المركز الصحي :_____ تاريخ تقييم المركز الصحي:_____

م	بنود تقييم الملاحظة	يرجى وضع دائرة حول "نعم "أو "لا" أو لا ينطبق / لم يلاحظ) لكل بند. إذا كان عنصر يسأل عن نوع من المعدات التي لا تستخدم على الإطلاق في المرفق، اختر لم يلاحظ
1	هل هناك أي من الابر او الحقن المستعملة داخل المركز الصحي و خارج الصناديق المخصصة لهذا الغرض؟	1. نعم 2. لا
2	هل هناك ترك لأي من ادوات سحب العينات بخلاف الإبر والمحاقن داخل المركز الصحي و خارج الصناديق المخصصة لهذا الفرض؟	1. نعم 2. لا 3. لم يلاحظ
3	هل هناك ترك لأي من مخلفات الحقن الوريدي داخل المركز الصحي وخارج الصناديق المخصصة لهذا الغرض ؟	1. نعم 2. لا 3. لم يلاحظ
4	هل هناك أي قارورة متعددة الجرعات من الدواء او التطعيم وبداخلها إبرة تركت على الطاولة المخصصة للعمل؟	1. نعم 2. لا
5	هل يوجد أدوات حادة مستخدمة في وعاء مفتوح في أي منطقة من المركز الصحي؟	1. نعم 2. لا

6	هل يوجد صندوق آمن منفصل في كل محطة للحقن في المركز الصحي على سبيل المثال: الأدوات الحادة والمعدية وغير المعدية؟	1. نعم 2. لا
7	هل يوجد في كل محطة تطعيم صندوق امن ومنفصل مقاوم ومانع للتسرب ؟	1. نعم 2. لا
8	هل يوجد أي تذكير و / أو منشورات تعزز الحد من استخدام الحقن ،وتعزيز والإدارة الآمنة للحقن و التخلص الآمن من معدات الحقن المستخدمة في المركز الصحي؟	1. نعم 2. لا
9	أذا كانت الاجابة نعم وضح	
10	هل كل الصناديق الآمنة والتي تنتظر التخلص منها نهائيا مغلقة تماما؟	1. نعم 2. لا
11	هل الصناديق الآمنة مخزنة في منطقة مؤمنة ومغلقة بعيدا عن وصول الجمهور لها ؟	1. نعم 2. لا
12	هل يوجد أدوات حادة مستخدمة على الأرض خارج المركز الصحي أو حول موقع التخلص من النفايات؟	1. نعم 2. لا

م	ملاحظة ممارسة الحقن	يرجى وضع دائرة "نعم" و "لا"، أو (لا ينطبق / لا يلاحظ) في العمود المعين. استخدام عمود واحد أدناه لتسجيل جميع الملاحظات الخاصة بك لحقن معين. والهدف هو مراقبة حقنة واحدة من كل نوع التي يتم توفيرها في كل وحدة الخدمة التي يتم تضمينها في البحث				
		المختبر	غرفة الاسنان	غرفة التطعيم	غرفة الحقن	الرمز
13	وجود مصدر للمياه النظيفة					1. نعم 2. لا 3. لم يلاحظ
14	وجود صابون بالقرب من مصدر المياه					1. نعم 2. لا 3. لم يلاحظ
15	وجود منشفة نظيفة بالقرب من مصدر المياه					1. نعم 2. لا 3. لم يلاحظ
16	توافر مواد مطهره في داخل المركز الصحي					1. نعم 2. لا 3. لم يلاحظ
17	العامل الصحي يغسل يداه بالماء والصابون قبل تحضير الحقنة					1. نعم 2. لا
18	العامل الصحي يغسل يداه بالكحول قبل تحضير الحقنة					1. نعم 2. لا
19	يتم اعداد الحقن على طاولة نظيفة مخصصة أو صينية حيث تلوث المعدات مع الدم وسوائل الجسم					1. نعم 2. لا
20	العامل الصحي يقوم بنصح المريض او المرافق بعدم التحرك أثناء اعطائه الحقنة					نعم لا

21	أنواع المحاقن المستخدمة في عملية الحقن 1. BCG 2. 0.5ml 3. 1ml 4. 2ml/3ml 5. 5ml 6. 10ml 7. أخرى (حدد)					1 2 3 4 5 6 7
22	حجم ابرة الحقن المستخدمة في عملية الحقن 1. 21, 22, 23,24,25,27G 2. انبوبة مفرغة من الهواء لسحب عينات الدم 3. المشرط 4. إبرة على شكل غراشة. 5. أخرى (حدد)					1 2 3 4 5
23	توجد مساحة آمنة وكافية للحقن الآمن					1. نعم 2. لا 3. لم يلاحظ
24	يتم تعقيم حقن الاسنان					1. نعم 2. لا 3. لم يلاحظ
25	العامل الصحي يستخدم قفازات أثناء عملية الحقن 1. قفازات جديدة تستخدم في كل عملية حقن 2. قفازات لم تتغير 3. لا تستخدم قفازات					1 2 3
26	حقن معقمة فتحت امام المريض قبل عملية الحقن					1. نعم 2. لا
27	إبر معقمة فتحت امام المريض قبل عملية الحقن					1. نعم 2. لا

28	إعداد اجراءات الحقن باستخدام تقنية معقمة					1. نعم 2. لا
29	أثناء إعداد الحقن هل الجرعة المعطاة صحيحة؟					1. نعم 2. لا
30	أثناء تحضير حقن التطعيم أو الدواء هل المذيب المستخدم من نفس الشركة المصنعة للدواء؟					1. نعم 2. لا 3. لم يلاحظ
31	عند إعادة تكوين التطعيم أو العلاج يتم استخدام محقن وإبرة جديدة معقمة					1. نعم 2. لا 3. لم يلاحظ
32	العامل الصحي يقوم بتنظيف الغطاء المطاطي للقارورة متعددة الجرعات بمطهر بعد سحب كل جرعة					1. نعم 2. لا
33	العامل الصحي يقوم بتنظيف الغطاء المطاطي للقارورة متعددة الجرعات بمسحة مستخدمة سابقا بعد سحب كل جرعة					1. نعم 2. لا
34	الإبرة تزال من الغطاء المطاطي للقارورة متعددة الجرعات بعد سحب كل جرعة تطعيم أو دواء					1. نعم 2. لا
35	تستخدم قطعة شاش صغيرة لحماية الإصبع عند عملية كسر أمبولة الدواء او المذيب					1. نعم 2. لا
36	تقنية الحقن صحيحة (الإصبع لا يلامس الإبرة وموقع الحقن صحيح)					1. نعم 2. لا

37	يتم تنظيف الجلد (مكان الحقن) قبل عملية الحقن .1 المياه .2 بوفيدون اليود أو الكحول ٪70 3 .مطهر اخر 4 مسحة مستخدمة سابقا					1 2 3 4 5
38	يتم تغطية الابرة بعد عملية الحقن وقبل التخلص من الحقنة					1. نعم 2. لا
39	العامل الصحي يقوم بوضع الغطاء على الابرة باستخدام كلتا اليدين في مرحلة من مراحل الحقن					1. نعم 2. لا
40	تحفظ جرعات التطعيم في درجة حرارة ما بين 2-8 درجة مئوية خلال عملية الحقن					1. نعم 2. لا
41	يوجد مسحة مستخدم سابقا في عملية تنظيف الجلد في مكان العمل أو على الارض					1. نعم 2. لا 3. لم يلاحظ
42	بعد سحب عينة دم أو بعد إعطاء الحقنة يقوم العامل الصحي بالضغط على مكان الحقن بقطعة شاش نظيفة لوقف النزيف					1. نعم 2. لا
43	إذا حدث تجمع دموي أثناء عملية الحقن يقوم مقدم الخدمة الصحية بإنهاء العملية والضغط على مكان التجمع لمنع زيادة النزيف.					1. نعم 2. لا
44	العامل الصحي يقوم بتنظيف مكان العمل بمطهر بعد عملية الحقن إذا كان هناك وجود لأي سوائل أو دم					1. نعم 2. لا
45	بعد عملية الحقن العامل الصحي يغسل يديه بالماء والصابون أو باستخدام الكحول					1. نعم 2. لا

46	يوضع صندوق آمن واحد لكل عامل صحي وفي كل مكان حيث تعطى الحقن					1. نعم 2. لا 3. لم يلاحظ
47	يتم تجميع الأدوات الحادة والحقن في صناديق آمنة بعد الانتهاء من عملية الحقن					1. نعم 2. لا
48	هناك تواجد للحقن والابر في حاوية أخرى غير الصناديق الآمنة					1. نعم 2. لا 3. لم يلاحظ
49	يوجد صناديق آمنة ممتلئة أو مفتوحة					1. نعم 2. لا
50	الصناديق الآمنة الممتلئة تحفظ في مكان أمن					1. نعم 2. لا
51	هناك أدلة لوجود أدوات حادة ومحاقن في جميع انحاء المركز الصحي					1. نعم 2. لا
52	هناك أدلة لوجود فوضى ناجمة عن التخلص من النفايات					1. نعم 2. لا 3. لم يلاحظ
53	العامل الصحي يستخدم كلتا يديه عند نقل الدم من الحقنة الى أنبوبة سحب العينات.					1. نعم 2. لا 3. لم يلاحظ
54	هناك طريقة أخرى تستخدم لتعقيم المحاقن المستخدمة في عملية الحقن إذا كانت الإجابة بنعم، تحديد الطريقة					1. نعم 2. لا

Annex 8: Helsinki Committee Approval Letter

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: 04/04/2016 **Number:** PHRC/HC/105/16

Name: Maysoon M. abu Rabee **الاسم:** ميسون أبو ربيع

We would like to inform you that the committee had discussed the proposal of your study about:

نفيدكم علماً بأن اللجنة قد ناقشت مقترح دراستكم حول:

Assessment of injection safety in Primary Health Care centers - Gaza Governorates

The committee has decided to approve the above mentioned research. Approval number PHRC/HC/105/16 in its meeting on 04/04/2016

و قد قررت الموافقة على البحث المذكور عاليه بالرقم والتاريخ المذكوران عاليه

Signature

Member **Member**

Chairman

Genral Conditions:-

1. Valid for 2 years from the date of approval.
2. It is necessary to notify the committee of any change in the approved study protocol.
3. The committee appreciates receiving a copy of your final research when completed.

Specific Conditions:-

E-Mail:pal.phrc@gmail.com

Gaza - Palestine غزة - فلسطين

Annex 9: Ministry of Health Permission Letter

State of Palestinian

Ministry of health

دولة فلسطين

وزارة الصحة

التاريخ:24/02/2016

السيد : ناصرالدين رافت مصطفى ابوشعبان حفظه الله

مدير عام بالوزارة/الإدارة العامة لتنمية القوى البشرية - /وزارة الصحة

السلام عليكم ورحمة الله وبركاته ,,,

الموضوع/ تسهيل مهمة باحث/ ميسون محمود أبو ربيع

التفاصيل //

بخصوص الموضوع أعلاه، يرجي تسهيل مهمة الباحثة/ **ميسون محمود أبو ربيع**
:- الملتحقة ببرنامج ماجستير الصحة العامة - جامعة القدس أبو ديس في إجراء بحث بعنوان

" Assessment of Injection Safety in Primary Health Care Centers – Gaza Governorates"

حيث الباحثة بحاجة لتعبئة استبانه من عدد من مقدمي الخدمات الصحية في مراكز الرعاية الأولية في قطاع غزة وتعبئة نموذج ملاحظة من عدد من غرف هذه المراكز، بالإضافة لإجراء مقابلات مع عدد المسئولين عن هذه المراكز، بما لا يتعارض مع مصلحة العمل وضمن أخلاقيات البحث العلمي و دون تحمل الوزارة أي أعباء أو مسئولية.

,,,وتفضلوا بقبول التحية والتقدير

محمد ابراهيم محمد السرساوي

- مدير دائرة/الإدارة العامة لتنمية القوى البشرية

التحويلات

محمد ابراهيم محمد السرساوي(مدير دائرة)	← ناصرالدين رافت مصطفى ابوشعبان(مدير عام بالوزارة)	إجراءاتكم بالخصوص
ناصرالدين رافت مصطفى ابوشعبان(مدير عام بالوزارة)	← فؤاد عبد الحليم توفيق العيسوي(وكيل وزارة مساعد)	إجراءاتكم بالخصوص
فؤاد عبد الحليم توفيق العيسوي(وكيل وزارة مساعد)	← جهاد محمد محمد مطر (مدير دائرة)	للمتابعة
محمد احمد محمود ابو سمعان(مدير دائرة)	← عطاف محمد عبدالرحمن عوض(رئيس قسم اداري)	لعمل اللازم
محمد احمد محمود ابو سمعان(مدير دائرة)	← خالد محمد محمود ابو سمعان(صيدلي قانوني / رئيس قسم)	لعمل اللازم
محمد احمد محمود ابو سمعان(مدير دائرة)	← نضال صلاح محمد المصري(رئيس قسم اداري)	لعمل اللازم
محمد احمد محمود ابو سمعان(مدير دائرة)	← زياد حمدي احمد المصري(اداري)	لعمل اللازم
محمد احمد محمود ابو سمعان(مدير دائرة)	← عبد الناصر حمد موسى ابوجزر(رئيس قسم اداري)	لعمل اللازم
محمد احمد محمود ابو سمعان(مدير دائرة)	← محمد عمر محمود خليل(رئيس قسم اداري)	لعمل اللازم

Annex 10: UNRWA Permission Letter

Al-Quds University
Jerusalem
School of Public Health

جامعة القدس
القدس
كلية الصحة العامة

التاريخ ٢٠ /٢/٢٠١٦

حضرة / د. غادة أبو نحلة المحترم
مديرة برامج الصحة بوكالة الغوث الدولية
السلام عليكم ورحمة الله،،،

الموضوع: مساعدة الطالبة مبسون محمود ابو ربيع

نشكر لكم دعمكم الدائم لمسيرة العلم والتعليم وخصوصاً دعم كلية الصحة العامة وطلابها، وعليه نرجو التكرم بالعلم بأن الطالبة المذكورة أعلاه تقوم بعمل بحث حول تقييم الحقن الامن بمراكز الرعاية الاولية بقطاع غزة كمتطلب للحصول على درجة الماجستير في الصحة العامة

وعليه نرجو من سيادتكم التكرم بالموافقة على تسهيل مهمة الطالبة في إنجاز هذا البحث .

شاكرين لكم حسن تعاونكم ودعمكم للمسيرة التعليمية،،،
و اقبلوا فائق التحية و الاحترام،،،

د. بسام أبو حمد
منسق عام برامج الصحة العامة
جامعة القدس–فرع غزة

نسخة:

Jerusalem Branch/Telefax 02-2799234
Gaza Branch/Telefax 08-2644220 -2644210
P.O. box 51000 Jerusalem

فرع القدس / تلفاكس 02-2799234
فرع غزة / تلفاكس 08-264420-2644210
ص.ب. ٥١٠٠٠ القدس

Annex 11: List of Expert Names

Dr. Bassam Abu Hamad	Assistant Professor in Public Health
Dr. Isa Saleh	Director of Communicable & non communicable diseases UNRWA
Dr. Majdi Dhair	Director of preventive medicine department in MOH
Dr. Mohamed Abu Hashish	Assistant Professor in Public Health
Dr. Imad Al-Aour	Health Area Officer UNRWA
Dr. Khitam Abu Hamad	Assistant Professor in Public Health
Dr. Nedal Ghunim	Epidemiologist in MOH
Miss. Sabrin Nashabet	Deputy Director Women Health
Mr. Jehad A. Ahmed	Expanded Program on Immunization Manager
Mrs. Fayza Al-Sharif	Field Nursing UNRWA

ملخص الدراسة

ممارسة الحقن الأمن عنصرا هاما من مكافحة العدوى الأساسية وممارسة الحقن غير المأمونة تكون سبب في انتقال أمراض الدم ولضمان ممارسة الحقن الآمن لكل من مقدمي الخدمة الصحية والمرضى يجب مراعاة آلية الحقن السليمة، ولكن في البلدان ذات الدخل المنخفض لا تزال مهملة تحت ضغط من التحديات الاجتماعية والاقتصادية والسياسية الساحقة ووضع المرضى ومقدمي الرعاية الصحية في خطر الآثار الجانبية المعدية وغير المعدية الناجمة من عملية الحقن.

وهدفت هذه الدراسة الى تقييم ممارسات الحقن الآمن ونظم الإدارة التي تعزز الحقن الآمن في مراكز الرعاية الصحية الأولية في محافظات غزة.

منهجية الدراسة الحالية هي التثليث الكمي والنوعي من البيانات وهي دراسة وصفيه تحليليه من أجل تحقيق الهدف الرئيسي من الدراسة. وقد تم اختيار ثلاثين من مراكز الرعاية الصحية الأولية المركزية في كل محافظة من محافظات غزة (11 مركزا صحيا من وزارة الصحة و 19 مركزا صحيا من وكالة غوث وتشغيل اللاجيئين)، وتم اختيار عينة طبقية عنقودية من العاملين في مجال الرعاية الصحية الأولية في مرافق وزارة الصحة والرعاية الصحية الأولية التابعة لوكالة غوث وتشغيل اللاجئين. كما وشملت الدراسة360 من العاملين قي مراكز الرعاية الصحية الاولية،5 من المهنيين الصحيين في عشرة مراكز من مراكز الرعاية الصحية الأولية في وزارة الصحة ووكالة غوث وتشغيل اللاجئين للتقييم الملاحظة و ستة من اصحاب القرار في وزارة الصحة ووكالة غوث وتشغيل اللاجئين. وقد تم جمع البيانات من خلال استبيان ذاتي التعبئة، و استبيان تقييم الملاحظة ومقابلة متعمقة مع أصحاب القرار وكانت نسبة الاستجابة 100%. كان تحليل البيانات عن طريق استخدام الحزمة الإحصائية للعلوم الاجتماعية والحيوية-الاصدار 20 (SPSS 20) ذات دلالة إحصائية وضعت في القيمة الاحتمالية 0.05.

أظهرت النتائج أن 52.2٪ من العاملين في مجال الصحة كان معدل معرفتهم جيدة عن القضايا الرئيسية للحقن الآمن . وأظهرت هذه الجماعات ارتفاع درجة المعرفة بين العامليين الصحيين في وكالة غوث وتشغيل اللاجئين عن القضايا الرئيسية للحقن الآمن عن العامليين الصحيين في وزارة الصحة (قيمة P <0.01)، كما وأظهرت هذه المجموعات المعرفة المرتفعة بالقضايا الرئيسية للحقن الآمن بين الطواقم الحاصلة علي التدريب على الحقن الآمن (P value 0,002) اما معرفة مسؤول التمريض فكانت (P value 0,003) ولحاملي الدبلومة فكانت (P value 0,001) ، خلال المقابلات المتعمقة مع أصحاب القرار أشاروا أن السبب الرئيسي لإرتفاع نسبة المعرفة عن الحقن الآمن بين مسؤلي التمريض هو بسبب الخبرة المتراكمة الناجمة عن حضور العديد من ورش العمل وندوات سلامة الحقن واثنان من أصحاب القرار قالا ان السبب الرئيسي هو دورهم العملي في الإشراف على الآخرين، حتى انهم من المفترض أن يكونوا أكثر دراية بسبب طبيعة عملهم. وافادت النتائج ان هناك دلالة إحصائية تجمع ممارسة الحقن الآمن مع اختلاف المراكز الصحية ومعدل التحصيل العلمي لمقدمي الخدمة الصحية هذه الاختلافات اظهرت ان مقدمي الخدمة الصحية في وزارة الصحة أكثر عرضة لوخز الإبر من مقدمي الخدمة الصحية في وكالة غوث وتشغيل اللاجئين على الرغم من أن مقدمي الخدمة الصحية في وزارة الصحة تلقوا تدريب عن مأمونية الحقن أكثر من مقدمي الخدمة الصحية في وكالة غوث وتشغيل اللاجين ، ولكن هذه الاختلافات لم تكن ذات دلالة احصائيه . وكان معظم العاملين في مجال الرعاية الصحية بوكالة الغوث تلقوا جرعات كاملة من لقاح التهاب الكبد الوبائي البائي واظهرت النتائج وجود اختلافات بينهم ذات دلاله احصائيه (P value 0,0021).

افادت النتائج بان هناك علاقة بين الوخز العارض بالنيدل والمطعمين بلقاح الالتهاب الكبد الوبائي البائي ومعدل التحصيل العلمي ، وهذه العلاقة ذات دلاله احصائية (P value 0.00, 0,002) على التوالي، مقدمو الخدمة الصحية معظمهم تلقوا جرعات كاملة من لقاح الكبد الوبائي البائي وكان معظهم على علم بمرض واحد على الأقل من الامراض التي تنتقل عن طريق ممارسة الحقن الغير الآمنه.

كانت سياسة إدارة سلامة الحقن في التخلص من النفايات غير متوفرة للعرض في أي مرفق من المرافق الصحية، على الرغم من أنه خلال المقابلة المتعمقة مع أصحاب القرار، فريق وزارة الصحة أكد أنه لا يوجد بروتوكولات أو مبادئ توجيهية مكتوبة في المرافق الصحية في وزارة الصحة، من ناحية أخرى فريق وكالة غوث وتشغيل اللاجئين أكدوا على وجود نسخة الكترونية ونسخة مكتوبة من البروتوكولات التوجهية عن سلامة الحقن وتم تحديثها في عام 2010. خلال تقييم الملاحظة لاحظ الباحث أن العاملين يقومون بالتخلص من النفايات الطبية دون اتخاذ أي تدابير سلامة. وعلاوة على ذلك، لم يتلقى أي من هؤلاء العاملين أي تدريب رسمي في مجال إدارة النفايات ولكن خلال المقابلة المتعمقة نصف أصحاب القرارقالوا أن الموظفين الذين يقومون بالتخلص من النفايات تلقوا تدريبا في مجال إدارة النفايات الصحية، وقال النصف الآخر أنهم لم يتلقوا اي تدريب في مجال إداراة النفايات الصحية.

لاحظ الباحث أن ممارسات مكافحة العدوى غير سليمة بين مقدمي الرعاية الصحية وعدم اتباع وسائل الحماية الشخصية بين مقدمي الخدمة الصحية. كل العاملين في مجال الرعاية الصحية الأولية لا يغسلون أيديهم بالماء والصابون أو الكحول قبل أو بعد إعطاء الحقن. كما ولاحظ الباحث ان 40٪ من صناديق السلامة الممتلئة مفتوحة في جميع المرافق الصحية.

وخلصت الدراسة إلى وجود ثغرات مختلفة في عملية الحقن الآمن في مراكز الرعاية الصحية الأولية في قطاع غزة، يمكن لجميع الثغرات ان تسد من خلال تدريب مهني منتظم مدعم ببرنامج تعليمي من قبل الإدارات الصحية في محافظات غزة وايضا هناك حاجة لتقييم مأمونية الحقن بشكل دوري في جميع المرافق الصحية من قبل أصحاب المصلحة ذوي الصلة.