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Compliance of Dental Health Care Providers with Infection Prevention and Control Protocol in the Dental Units at UNRWA Health Centers in Gaza Governorates

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Dedication

I would like to express my great feeling and gratitude to my dear husband, my lovely daughters Areej, Yara, and my sole sons Jameel and Kareem who were so patient and encouraging me during my study time. This study wouldn't be possible without their co-operation.

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Tamam Mohamed Abu Zaid

Declaration

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

Signature …….

Tamam Mohamed Abu Zaid

Date: April, 2010

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Abstract

Nowadays, the issue of cross infection becomes a vital part of dental practice and a major concern to dentists and policy makers. This is due to the increased risk of blood borne diseases. Health care-associated infections lead to increase mortality and morbidity, disability and excessive medical costs. In 2004, a National Palestinian Infection Prevention and Control Protocol has been developed, but its implementation in dental units has not yet been adequately investigated.

This study aims to evaluate the compliance of dental healthcare providers with the infection prevention and control practices in all UNRWA health centers. The study included 80 participants, divided as follows; 48 dentists, 28 practical nurses and 4 oral hygienists. Three instruments were used; interviewed questionnaire for health care providers, a checklist of infection prevention and control practices of health providers and a checklist of dental units' structure and suitability. All subjects positively responded.

The study showed that males represented 78% and females represented 21%. Half of the respondents have had received a training on the infection prevention and control. The infection prevention and control protocol was reported to be available by 43.8% of the respondents. The study revealed that there were no severe shortages in the basic equipment and infrastructure that are needed for the protocol implementation in the dental units. In contrary, there were shortages in some items such as utility gloves, alcohol with glycerin, towel papers for beds, face mask and aprons. Regarding the participants' knowledge about the infection prevention and control standards precautions; 56% said that they are familiar with this concept and of those 40% could define the term of standard precautions.

Regarding measures needed to increase the compliance with infection prevention and control, participants reported decreasing work overload (46%) and rewards and punishment 21%. By observing the participants during their work, the study showed that only 35% of the respondents had washed their hands between patients, 76.7% changed gloves between patients, 80% used mouth mask when dealing with patients, 26.3% of them disinfected the dental surfaces with disinfectant solution, 1.7% used face mask, 73.8% used mouth masks, 98.7% of participants always used coats, 49.6% of the total participants disposed waste in a proper way.

The study has revealed that there were no statistically significance differences between the IPC practices and the socio demographic variables. The study revealed that there were statistical significant differences between infection prevention and control practices and education and the availability of a copy of infection prevention and control protocol. The researcher recommends disseminating the infection prevention and control protocol, providing training, providing resources and adequate follow up.

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List of Abbreviations

CDC	Center for Disease Control
DHCP	Dental Health Care Provider
DU	Dental Units
HCPs	Health Care Providers
Hep. B	Hepatitis B Virus
HIV	Human Immunodeficiency Virus
IPC	Infection Prevention and Control
JCP	Job Creation Program
MOH	Ministry of Health
NGO'S	Non Governmental Organization
PCBS	Palestinian Central Bureau of Statistics
PHC	Primary Health Care
PNA	Palestinian National Authority
SPSS	Statistical Package for Social Sciences
UNRWA	United Nation Relief and Work Agency for Palestinian refugees
WHO	World Health Organization

Chapter One

Introduction

Chapter 1

Introduction

1.1 Background

Can you imagine that you can save a life by your hands? Washing your hands, soaking an instrument in 0.5% chlorine solution for ten minutes, wearing gloves, aprons, masks and other protective barriers, or even follow some instruction regarding infection prevention and control practices. All may help in saving lives. Nowadays the issue of cross infection becomes a vital part of dental practice and a major concern to dentists and patients. This is due to the increased risks of blood borne diseases such as hepatitis and other diseases (Morris, et al. 1996). These diseases can be transmitted after needle stick injuries and/or direct contact with blood, body secretions and saliva (Al-Dwairi, 2005). Also because many infected patients are unaware of their status or not willing to discuss their disease status with health care workers, we have to consider all clients are infected and deal them in the same manner all the time (Samaranayake, 1993). There have been several reports of the transmission of infectious diseases to patients from surgeons despite the development of the universal precautions (Wkly, 1997).

Clients, who attend any dental clinic, might be susceptible to infection due to direct contact with blood, instruments, and health team (CDC, 2003). Infectious diseases are diseases that can be transmitted from person to another (CDC, 2003). CDC has defined infection as "*the transmission of microorganisms into a host after evading defense mechanism, resulting in the organism's proliferation and invasion within host tissue"* (CDC, 2001 p.11). The way the host responds to infection differs from a person to another. Some may develop clinical symptoms, and the others became a symptomatic, with manifestations of disease mediated by direct organisms pathogenesis and/or a function of cell-mediated or antibody responses that result in the destruction of the tissues (CDC, 2003)

Most of infectious diseases are caused by micro organisms such as bacteria, viruses and fungi and they are spread through blood, body fluids, mucous membrane, semen and vaginal discharge (Centre for Disease Control-CDC, 2001). In addition to that, the health

providers are dealing with these secretion and excretions all the time either by direct or indirect contact. There is a great need to follow clear guidelines in order to protect the client, community and the health provider as well (American Dental Association, ADA, 1988).

Dental health care providers and other health care givers are known to be at increased risk of getting infections during the daily work (ADA, 1998). In spite of the presence of a routine infection control recommendations and procedures since the 1970's, they had been ignored even by highly educated Groups in general (Omolara, 2008). Infection control practices in second and third world settings have not been widely documented. Furthermore, there is no information reported regarding infection control practice in Palestine (Al-Khatib, 2004). Knowledge of clinical infection control practices is continually growing and changing (CDC, 2003). While the principles of infection control (prevention, transmission and control) do not change, specific clinical practices may evolve as a result of new evidence. For this reason, the IPC protocol should be evaluated and updated according to the unstopped changing around us (Kugel et al, 2000).

In order to minimize the risk of cross infection in the dental clinics, specific recommendations have been issued by many international organizations like CDC and other professional health agencies. These recommendations include routine use of barrier techniques like gloves, masks, and heat sterilization of dental instruments, vaccination against HBV, and the adoption of universal precautions (CDC, 2003). Dentists' compliance with these recommendations and infection control programs (IPC) has been recently studied in different parts of the world (Dwairi, 2005), but here in the Middle East it is not well known (Al-Khatib, 2004).

Despite of the fast technological development in health services throughout the world, many health workers don't follow the basic IPC protocol practices, even routine hand washing. (Omolara, 2008). Palestinian IPC protocol emphasize on the use of universal standard precaution which consider all blood and blood contaminant fluid is potentially infectious so we must deal with all people the same way (CDC, 2003). In order to reduce the risk of cross infection in dental clinics, all health care providers should follow the Palestinian protocol instructions. The protocol emphasized on the use of protective barriers

(gloves, masks, aprons, and face masks --etc), decontamination and cleaning of dental instrument, vaccination against hepatitis and the universal precaution (MOH, 2004). In this research the researcher is going to explore the level of compliance among dental health care providers in UNRWA primary health centers in Gaza

1.2 Research Problem

Because the compliance status in Palestine in general and at UNRWA in specific is not adequately known yet, this study aims to assess the status of compliance with the infection and control protocols in dental units. It will consider areas of compliance and areas of noncompliance thus; it recognizes the areas for improvement. This makes this study as important one because it may help in developing and clarifying the underlying factors affecting the employee's adherence with the Palestinian IPC protocol.

Palestinian Infection and control protocol is considered as a measure to decrease the likelihood of cross infection among clients and health care provider and improve quality of care, save many lives and save resources. According to the international standards, the Palestinian IPC protocol must be updated every two years. This study will help in interpreting many aspects related to the compliance, use, and availability of this protocol.

The identification of infectious diseases and the way of their transmission through contact with blood and dental surgeon as a result of cross infection with blood borne pathogens will enable us to recognize how can we avoid them (CDC, 2003). So that there is a great need to study the degree of compliance among dental health care providers (DHCP) with infection prevention and control (IPC) protocol in order to reduce the risk of transmission of blood borne diseases in health care facilities (MOH, 2004).

1.3 Justification for the problem

There are increasing risks of transmission of infectious diseases and other blood borne pathogens from client to client or from client to health provider vice versa (CDC 2004). Recently, a Palestinian IPC protocol was developed by national efforts and was distributed to all UNRWA health centers as apart of its policy (MOH, 2004). Since then, no over all evaluation was done to this program and the compliance status with this protocol. In spite

of internal follow up in the clinics to the implementation of the Palestinian IPC practices, there is no scientific study has been conducted to assess the DHCP compliance with the Palestinian IPC protocol. Therefore, in order to give a clear idea in a scientific way about the implementation of IPC protocol, this study may help in answering the question which was asked before; to what extent the DHCP in UNRWA health centers comply with the IPC protocol. It also may help in finding any possible ways to improve the compliance status. This may enhance the prevention of infection and decrease morbidity rate in Palestine. More compliance will reduce as much as possible cross infection in dental units and encourage positive practices.

Studying the compliance in dental units is especially important because dental care professionals are at increased risk of cross infections while dealing with the clients and patients. Because the infected patient is unaware of their status and there is no way to tell who is infected and who is not, the dentist should consider that every person is infected and deals with him according to the universal precautions and therefore should follow the Palestinian IPC protocol.

This study has been done specifically for Gaza-UNRWA which might be different than others; country-specific. Non-compliance of the IPC protocol will affect the health system financially and economically so it is worthy to study the factors affecting the compliance of DHCP with Palestinian IPC protocol. This study will be the first according to the researcher's knowledge which is conducted to study the compliance with infection control in dental units at UNRWA health centers in order to reduce the mortality and morbidity since the infection still is one of the leading causes in the world (MOH, 2006). Another study was conducted to study the compliance of neonatal ICU unit workers at the governmental hospitals in 2009 by awad (Awad, 2009)

1.4. Study Objective

1.4.1. General objective of the study

To evaluate the compliance with the national infection prevention and control protocol in dental units at UNRWA primary health centers in Gaza Governorates. This study could help in illustrating possible ways for improvement and reducing the risks of cross infections which are known to affect the mortality and morbidity.

1.4.2 Specific objectives

- To assess the IPC practices in dental units in reference to the national infection prevention and control protocol.
- To recognize the areas of strength and weakness in dental practices regarding infection control.
- To assess variations in IPC practices in relation to demographic and organizational variables
- To explore the availability of infrastructure related items at dental units in reference to IPC standards.
- To suggest recommendations that could help in improving the compliance of dental units to IPC.

1.5 Research: questions

1. To what extent the IPC practices are implemented in dental units?
2. Are there differences among the different health workers regarding compliance with the Palestinian IPC protocol?
3. Is there any variation among clinics regarding the implementation of IPC protocol?
4. Does training affect the implementation of the IPC protocol?
5. What are the limitations and challenges that prevent the dentist from adopting his/her role regarding the IPC protocol?
6. Are the dental units well equipped to fit the IPC standards?
7. Are there copies of the IPC protocol available in the dental units?
8. What are the motivators that help dental health care providers to comply with the Palestinian IPC protocol?
9. What are the possible suggestions that could be given to the dentist in order to improve the quality of care and adhere to the IPC protocol?
10. What are the gaps between the different health centers regarding the IPC protocol practices?

1.6 Context of the study

In order to understand the health care system and the dental care better, the researcher provided some helpful background information. Dental clinics are one of the health sectors as many other sectors are affected by the political, socioeconomic and demographic situation. Some of the relevant information regarding the demographic, socioeconomic, and the political situation may affect the dental clinics and the availability of materials will be affected by it, so it will be presented in the next paragraphs.

1.6.1. Geographic and Demographic context

Palestine is about 6,020 sq. Km. It lays on the western edge of Asian Continent and the eastern extremely of the Mediterranean Sea (Annex1). It is bounded by Lebanon and Syria to north, Mediterranean Sea to west, the Gulf of Aqaba to south and Jordan to the east. The total population in Palestine is more than 3,761,646 individuals (about 1,416,539 in the Gaza Strip (GS) 67.9% are refugees and 2,345,107 in the West Bank (WB) with population density of 625 capita per sq Km in Palestine, (Palestinian center Bureau of Statistics - PCBS, 2009). GS is a narrow piece of land lying on the cost of the Mediterranean Sea with population density of 4,118 inhabitants per Km2 (PCBS, 2009). Gaza Strip is composed of five governorates: the North, Gaza City, the Mid Zone, Khan Younis and Rafah. The Gaza Strip is mostly flat and large areas are sandy, often continuing from the beaches which run along the entire coast (See Annex 2).

1.6.2 Political and economical context

The situation for 1.5 million Palestinians in the Gaza Strip is worse now than it has ever been since the start of the Israeli military occupation in 1967 (PCBS, 2006). The current situation in Gaza is man-made, completely avoidable and, with the necessary political will, can also be reversed. Unemployment in Gaza is close to 40% and is set to rise to 50% (PCBS, 2009). The number of people living in absolute poverty in Gaza has increased sharply. Today, 80% of families in Gaza currently rely on humanitarian aid compared to 63% in 2006. This decline exposes unprecedented levels of poverty and the inability of a large majority of the population to afford basic food (PCBS, 2009).

Today, Gaza is governed by the local government in Gaza independently from West Bank, and by the Islamist organization and party Hamas. Israel still holds overall control over the Gaza Strip. It has the upper hand over borders, movement of goods and travelers in and out of Gaza, particularly the Palestinian themselves. It also controls trade, the commercial market, water, the main sources of energy, the means of communications and the overall security. Hence, it still has hold over the Palestinian economy (PCBS, 2009). The war on Gaza that started on December 27- 2008 has further deteriorated the already miserable situations (Palestinian Non-Governmental Organizations (PCBS, 2006).

The described above situation has negatively affected the health status of the population including increasing poverty related diseases, malnutrition, anemia. In addition, the unprecedented division of Palestinians resulted in further mudding the waters and negatively affected the ability of health providers to meet the increasing needs and demands of the population.

1.6.3. Health care context

Health care-associated infections lead to increase mortality and morbidity, disability and excess medical costs (WHO, 2007). The consequences of closures of borders and separation formed a great challenge for the ministry of health in general and the health system in particular. It created problems regarding the accessibility of people to health care services and affects the unity of the health care system in all Palestinian governorates (MOH, 2005). Health care services in Palestine are provided by four main sectors, which are, Ministry of health, Non governmental institutions, UNRWA, Private sector (MOH, 2005).

Viral hepatitis and as well as acute bloody diarrhea remain the major causes of morbidity among reportable infectious diseases in the refugee population of the Gaza Strip as acute hepatitis incidence fluctuated throughout the reporting period (UNRWA biweekly report, 2010). The incidence rates of viral hepatitis and typhoid fever are being monitored regularly and compared with the previous historical data. Any perceptible change due to seasonality is therefore also being detected. The incidence of acute hepatitis in the

reporting period showed a fluctuating trend throughout the reporting period reaching the incidence levels recorded in previous years.

Palestinian society is in a period of epidemiological transition where in addition to the presence of infectious diseases there are increasing in the rates of non-communicable diseases. In Palestine, 1,044 deaths were reported to the infectious diseases in 2005 with death rate of 27.8 per 100,000 populations (MOH, 2005). Among infants and children under five years, 179 and 233 deaths were reported with a rate of 1.7 and 0.3 per 1000 infant respectively (MOH, 2005). The mortality rate due to the infectious diseases among adult aged 60 and above was 369.4 per100, 000 populations (MOH, 2005). Distribution of mortality by sex due to the infectious diseases among males (53.4%) was greater than female which 46% (MOH, 2005) was. 65 deaths (47 deaths in Gaza and 18 deaths in WB) were reported due to infectious diseases such as hepatitis and pulmonary diseases. Mortality rate due to pneumonia and other respiratory infections still the highest incidence rate of infectious disease, per 100,000 populations. The infant mortality rate is 21% in 2007, with uprising from the last five years (MOH, 2005).

The severe shortage of drugs was in parallel with the out of use of medical equipment necessary for the diagnosis and treatment of many diseases in all hospitals and primary health centers. This includes the devices used for newborn feeding, kidney dialysis, equipment material used in infection control and equipment needed for CT scan (MOH, 2007). Closure of the crossings borders which led to suspension of the necessary maintenance parts and lack of spare parts they need and the shortage of chlorine solutions used in instrument processing in various areas in the health centers. This also led to a decline in the quality of health services provided by these hospitals and primary health centers for Palestinian patients (PINGO, 2009). The same report showed that 94 medical devices have stopped working because of the period of use and lack of spare parts for maintenance. One of these devices is special and general intensive care and neonatal heart, in addition to the devices of other diagnostic and therapeutic purposes (MOH, 2005).

1.7. Development of the Palestinian IPC protocol

Many countries in the world had developed protocols for the infection prevention and control (CDC, 2004). Because the unique situation that we live here in Palestine, we cant apply other's systems on our health system without adjusting it to our health system in our country. The Ministry of Health with cooperation of the MARAM project (2001-2004) initiated the national Palestinian IPC protocol that fits our situation and capabilities (MOH, 2004). This protocol focuses on many important aspects of infection control (MOH, 2004). These aspects includes hand hygiene, standard precautions, wearing gloves, using physical barriers, using antiseptic solutions, use a safe working environment, proper waste disposable, instrument processing like cleaning, decontamination, sterilization and other disinfection processes, and immunization to the employees in order to protect them from infection (MOH, 2004).

Many Palestinian, professionals and experts have worked together in teams under very difficult circumstances to develop this protocol and to ensure that they are adapted to the local Palestinian context. The Ministry of Health has supported the idea of developing such protocols as essential to strengthening the health care system in Palestine and distributed it in all its health settings (MOH, 2005).

In addition to the technical instructions available at UNRWA, the Hanan project also distributed the Palestinian IPC protocol to all health centers in UNRWA in Gaza Strip. This protocol has never been evaluated or assessed in dental settings. Also this Palestinian protocol has never been updated despite of the rapid technological advancement in the world and the spread of the huge number of microorganisms around us.

1.8. Dental and primary health care in Gaza Governorate

Walt, and Vaughan has defined the Primary Health Care (PHC) by dividing it into two parts, which where the level of services and the activities themselves (Walt, 1982). Alma-Ata Declaration adopted the PHC and considered it as important health care source and makes it as a method of reaching a comprehensive, universal, equitable, and affordable health services for all countries (Declaration of Alma-Ata, 1978). Moreover the conference

addressed the economical and political steps needed for funding the issues: "*An acceptable level of health for all people of the world by the year of 2000 can be attained through a fuller and better use of the world's resources, a considerable part of which is now spent on armament and military conflicts*"(Declaration of Alma-Ata, 1978).

The PHC is very important sector as it provides the needed services for almost the whole population and works at the protective and the curative fronts. It provides preventive measures such as immunization, family planning, and dental health services. While the curative services are providing medical care for the people, specialists care laboratory, dental care, ultrasounds, and health education and emergency medical services. (MOH, 2005). Primary health care centers in Palestine are 3731 centers (MOH 56.5%, UNRWA 7.3%, and 36.3% NGOS). Dental care is provided for all Gaza population in 253 MCH clinics in the MOH and 51 in the NGOs, 21 health centers in UNRWA. This level of capacity makes it difficult for people to receive sufficient and adequate services (MOH, 2005).

UNRWA's health program focuses on comprehensive preventive and primary health care. Services are covering medical care, family health, disease control and prevention, and health education which are provided directly and at no cost to Palestine refugees through the Agency's network of 21 primary health care facilities located both inside and outside refugee camps (UNRWA annual report, 2008). Medical care services consist of outpatient care, dental care and the rehabilitation of physically disabled persons (UNRWA, 2008).

Dental care is very important sector in the primary health care as it serves health education, health promotion, disease prevention, and disease cure (UNRWA, 2008). Two years ago the dental clinics in UNRWA health centers were 17. Because of the increase need for more dental clinics and care, UNRWA had hired another ten dentists and open the afternoon clinics for the benefit of the public in 2003. There are mobile dental units which provide care for the school’s students and do screening for many dental problems and treat any one who needs a treatment.

1.9 Operational definitions

Compliance

In our study, compliance does mean adherence to instructions, guidelines, and instructions as recommended by the Palestinian infection prevention and control protocols.

Infection prevention and control (IPC) practices: Various practices which, if used appropriately, restrict the spread of infection. It is important for health care providers, patients, and all members, contact to adhere to infection control guidelines. According to the center for disease control and prevention the IPC is defined as: measures including many procedures and strategies such as hand washing use of protective equipment (CDC, 2003).

Dental health-care provider (DHCP) refers to all personnel (technical and administrative) in the dental health-care settings who might be occupationally exposed to infectious materials, including body substances and contaminated supplies, equipment, environmental surfaces, water, or air. DHCP include dentists, dental hygienists, dental assistants, nurses, students and trainees, contractual personnel, and other persons not directly involved in patient care but potentially exposed to infectious agents (e.g., administrative, clerical, maintenance, or volunteer personnel) (CDC, 2003).

Dental units: all dental clinics either in the clinic or mobile ones which serves dental services (CDC, 2003).

Protocol: A rule, guidelines, or document which guides how an activity should be performed (CDC, 2003).

Nosocomial infection: Infection acquired in a hospital as a result of medical care (CDC, 2003).

Personal protective equipment (PPE): specialized clothing or equipment (for example, gloves, masks, protective eyewear, gowns) worn by an employee for protection against an infectious hazard. General work clothes (for example, uniforms, pants, shirts or blouses) are not intended to function as protection against a hazard and are not considered personal protective equipment (CDC, 2003).

Precautions: interventions implemented to reduce the risk of transmitting micro-organisms from client to client, client to health care worker, and health care worker to client. Precautions can include gloves, masks, eye protection, gowns and client accommodations (CDC, 2003).

Disinfection: a process that destroys or kills some, but not all, disease-producing micro-organisms on an object or surface (CDC, 2003).

Blood-borne pathogens (BBPs): viruses found in blood which produce infection, such as hepatitis B. virus (HBV), hepatitis C.virus (HCV) or human immunodeficiency virus (HIV) (CDC, 2003).

Micro-organism: microscopic organisms such as bacteria, virus or fungus, commonly known as germs that can cause an infection in humans (CDC, 2003).

Job creation program: It is a program conducted by UNRWA to give the opportunity to the unemployed people in Gaza Governorates to work in a temporary manner ranging from 6 months to one year with special contract (Self adopted).

Chapter Two

Literature review

Chapter2.

Literature review

In this chapter the researcher will present the literature reviewed regarding the IPC protocol practices and the DHCP practices and the ways to promote the use of IPC protocol and the relevant studies regarding this study. The framework of this study is designed by the researcher relies on the review of the available literature about IPC.

2. Conceptional framework

The researcher is intending to discuss and summarize the related factors which affect the compliance of DHCP with the Palestinian IPC protocol in dental units. Some of these factors are related to the dental employees and the other factors are related to the health system especially UNRWA and generally Palestine. The study is exploring the interaction between these factors and how they affect the DHCP compliance. The purpose of the conceptual model is organizing and donating representation of conceptualization of phenomena with the least use of wards (Burns and Grove, 1997).

2.1. Factors affecting compliance

2.1.1. Personal factors

The DHCP personal factors are divided to four subgroups, first the socio demographic factors such as gender, age, and years of experience, place of graduation, total years of experience. There could be a relationship between compliance with Palestinian IPC protocol and different personal factors (Pittet, 2002). So it is very important to study these factors.

2.1.2. Practices

Secondly, the DHCP'S practices concerning the general principles of the IPC such as wearing protective barriers when caring for clients, process instruments in the way it should be, proper waste disposal. This will give us a general picture about the compliance of DHCP with the IPC practices which could reflect to what extent their adherence with the IPC protocol practices. Thirdly, their knowledge about the Palestinian IPC protocol and the general principles can also be very relevant factor affecting his/her compliance. Finally the forth factor related to the dental employees attitudes regarding the Palestinian IPC protocol, for example how they are perceiving, believing and valuing the importance of the Palestinian IPC protocol and its effect on the promotion of health and reducing the cross infection, morbidity and mortality rates related to infection (Bolyard, 1998).

2.1.3. Organizational factors

2.1.3.1 Availability of IPC protocol

The second group of factors is related to the health system which may have the same effect as the first group. This group will illustrate if the health system is aware of the importance of the IPC protocol and adopted its principles. To assess also if the health organizations had distributed the IPC protocol to every clinic and even to every employee working in the dental unit in order to be available all the time and to be used as a guide for them all. This will be measured by counting the number of copies of the protocol in the studied clinics. This will show us the real intention of UNRWA to implement this program and make it succeeding. Availability of the resources and materials needed to implement practice and principles of IPC, enable the dental employees to be compliant all the time. This could be measured by making percent of the available materials in the clinic (Pittet, 2002)..

2.1.3.2 Training and Staff Development.

It is the role of the health sector and the organization administration to ensure that every person whose normal duties are directly or indirectly concerned with patient care receives suitable and sufficient training, information and supervision on the measures required to prevent and control the risks of infection (Hesse et al. 2006)..

There are three critical factors successful training depends on. First factor is the availability of physical facilities in the form of buildings and equipment. The other factor is availability of mentor. The last one is the real intention of the employees to learn. Training will provide each DHCP with the essential information and skills needed to implement the IPC protocol practices. In addition to this training will make them aware of the protocol importance. In fact if we make the two groups, the dental employee and the health system work together and communicate well and do regular evaluation and monitoring in order to ensure the proper implementation of the IPC protocol and improve the compliance of the dental unit to the IPC protocol practices (Barbra, 2004)..

There should be an infection control team to encourage attendance and reduce disruption to all service requirements. Infection control training is part of the initial structured training programs leading to professional qualification for all clinical dental staff. In addition to this there is a requirement to undertake an identified number of mandatory training hours in a five year period to ensure re-validation of professional registration. Regular monitoring of the procedures is essential. Infection control policy for the practice should be reviewed regularly and updated when necessary at least annually. All new staff must be appropriately trained in infection control procedures prior to working in the dental units (Hassan et al, 2004).

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Training should equip staff to understand how infections are transmitted, the practice policy on decontamination and infection control, what personal protection is required and when to use it, what to do in the event of accidents or personal injury, with regard to decontamination procedures. Training records should show that staff, have been appropriately trained are competent to decontaminate the reusable dental instruments currently in use. Training should be updated for any new employee introduced into the dental unit. Individual records of the training received should be maintained for all staff (Dental Care Association,1998).

Dental health care providers are more likely to comply with an infection-control program and exposure-control plan if they understand its rationale and its benefits. Clearly written

policies, procedures, and guidelines can help ensure consistency, efficiency, and effective coordination of activities. Personnel subject to infection exposure should receive infection-control training on initial assignment, when new tasks or procedures affect their occupational exposure, and at a minimum, annually. Education and training should be appropriate to the assigned duties of specific DHCP (Bolyard, 1998).

2.1.3.3 Dental unit's suitability

Another group of factors and could hardly affect the compliance in dental units is the suitability of the dental units to IPC protocol standards. The availability of equipments and materials, such as disinfectant solutions, clean water, protective barriers, sharp boxes, organized way of waste disposal, and this all will help the DHCP to perform his tasks in a proper way and increase the level of compliance. It is especially important that the equipment Manufacturers of dental devices and equipment should provide information regarding material compatibility with liquid chemical germicides, whether equipment can be safely immersed for cleaning, and how it should be decontaminated if servicing is required (Red book, 2006).

.Because of the risks associated with exposure to chemical disinfectants and contaminated surfaces, DHCP who perform environmental cleaning and disinfection should wear utility gloves and other protective barriers equipments to prevent occupational exposure to infectious agents and hazardous chemicals. The use of dental devices with features designed to prevent needle sticks and other injuries from sharp objects; hand hygiene products including alcohol hand rubs; latex hypersensitivity; and program evaluation All these factors together will affect the compliance to IPC protocol practices (CDC, 2004)..

2.1.3.4 Supervision, Monitoring and evaluation of the program

Supervision is the process of supporting others to improve client care and services by promoting professional practice. Medical errors are caused by faulty systems, processes, and conditions that lead persons to make mistakes or fail to prevent errors being made by others. A successful infection-control program depends on developing standard operating procedures, evaluating practices, routinely documenting adverse outcomes and work-

related illnesses in DHCP, and monitoring health-care--associated infections in patients (Sofola, 2003).

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Strategies and tools to evaluate the infection-control program can include periodic observational assessments, checklists to document procedures, and routine review of occupational exposures to blood borne pathogens. Evaluation offers an opportunity to improve the effectiveness of both the infection-control program and dental-practice protocols. If deficiencies or problems in the implementation of infection-control procedures are identified, further evaluation is needed to eliminate these problems (Henderson, et al. 1987)..

Effective program evaluation is a systematic way to ensure procedures are useful, feasible, ethical, and accurate. Program evaluation is an essential organizational practice; however, such evaluation is not practiced consistently across program areas, nor is it sufficiently well-integrated into the day-to-day management of the majority of programs (Karkashian CD, 2000).

2.2 Compliance with IPC protocol

According to the department of health and human services of the United State of America, there are seven components of compliance (USA, Federal Register, 2000). These components are not necessary for the health car providers to implement them all. The seven components are conduction, internal monitoring and auditing, implementing compliance and practice standards, designing a compliance officer or contact, conducting an appropriate training and education, responding correctly to the detected offences and develop corrective action, develop an open line of communications and enforcing disciplinary standards through well publicized guidelines (USA, Federal Register, 2000). Finally, assessing compliance levels using different methods in order to reach the accuracy as much as possible is very important not only to see whether the DHCP are compliant with the IPC protocol but also to make the compliance as a culture among all health care providers. These components are not necessary for the health car providers to implement them all (USA, Federal Register, 2000).

It is very important to develop standardized guidelines in order to unify the work in all health facilities and to get effective results of compliance. But this development of guidelines doesn't work alone unless it is followed by two other steps. First one is continuous assessment of the performance in respect to the guidelines. The second step is critical evaluation and monitoring of the performance (Kamps et al, 2000). It is very obvious that even with the availability of the guidelines, polices and procedures, changing the behavior is still difficult (Grimshaw, 1993). In order to overcome this issue we have to assess the dissemination and implementation of the guidelines in order to evaluate the compliance level with the guidelines (Lomas, 1991) and the compliance level can be increased by continuous training and education (Onion, 1998).

The literature indicates that gender differences have nothing to do with compliance and not indicated as a factor affecting the compliance (Gordon, 2001) but, other literature shows that male nurses use the infection precautions as wearing gloves, aprons, masks less often than female nurses and research indicates that male incompliance to infection prevention and control is due to many factors as to defend their masculinity and to avoid activities that seem to represent the female six and femininity. These differences may due to biological reasons as brain hormones, genes or culture, socialization; further studies need to be done to explore the real reasons for these differences (Williams, 1994).

There is a study done by Gershon showed that noncompliance was strongly correlated with three main domains. First domain personal factors such as sex, age, number of years of practice and level of knowledge related to the transmission of pathogens. Second domain is psychological factors such as perception of risk, fear of infection, attitude toward infected clients and risk-taking personality. Third domain is organizational management factors such as amount of previous staff in safe work practices, availability of personal protective barriers and environmental conditions in work places. Compliance rates were associated with some demographic characteristics. Female workers had higher overall compliance scores than did male workers. In other study conducted in Sheffield South-West Primary Care showed that female dentist comply with IPC is greater than male ones (Gershon et al, 1995).

2.3. History of the infection prevention and control

Until the 1800's surgeons didn't spend much time washing their hands and a patient's skin was hardly ever cleaned before surgery. Surgical instruments were only rinsed off and sponges were reused (CDC, 2003). In 1860, Joseph Lister began to spray Carbolic acid on surgical wounds, instruments and dressings (Miller, 1998). This reduced the number of deaths from surgery. Gloves were first used in the early 1900's to protect nurses hands from chemicals used during surgery (CDC, 2001). Years later, gloves become a barrier protecting patients and health care workers from infection. Until 50 years ago, patients with all different kinds of diseases stay in the same ward or room.

Before 1980 the infection control system was focusing on identifying the patients who are at risk in the hospitals and isolates him and gives him a special care. Isolation failed to recognize the infected person from non infected persons especially then a symptomatic persons (carriers) particularly those with blood borne viruses or antibiotic resistant bacteria. The appearance of blood borne diseases , make it urgent and very necessary to think in anew way and new strategies to deal with this arising problem and to protect the health care provider from getting infected from blood borne diseases in their working environment (CDC, 2003).

Changing individual behaviors requires multidimensional interventions. Reaching all healthcare workers as well as the community at large with the information needed to practice universal precautions is an ongoing effort. Getting everyone to improve infection control practices could be the first step in conquering the spread of infection. (Kreutzer, 1998). Infection prevention and controlled first began as an article written by the CDC in 1986 as a weekly basis about morbidity and mortality. In 1993 CDC had published the first recommendation about infection control in dentistry which focused on preventing transmission of disease of blood borne pathogens from person to person (CDC, 2001).

Due to the technological advancement and due to the spread of many blood borne infectious diseases, the CDC updated its guidelines to be major one and to be specific on special topics as environmental infection control and hand washing. It also consolidated previous guidelines and adds anew ones specific to infection control prevention in the

dental health settings (CDC, 2001). It became more scientific and adds more background information with a scientific rational for each recommendation. These guidelines are designed to prevent and reduce the potential for disease transmission from patient to DHCP, from DHCP to the patient and from patient to patient. This new guidelines emphasized on the use of standard precautions for the preventing exposure to and transmission of not only the blood borne pathogens but also pathogens encountered in oral health care settings (CDC, 2001) .

In 2003 the CDC updated the guidelines and start to use the term standard precaution instead of the universal precaution which assume that the clients secretion are contaminated all the time and we must deal with all people as if they are infected persons and use the protective barriers all the time (CDC, 2003). A universal blood and body fluids precaution (standard precaution), which emphasized on dealing with all the patient with the same way regardless to their previous infection history (CDC, 2003). The term "universal precautions is not applied on nasal secretion, sputum, sweats, tears, urine, and vomits, unless they contain visible blood in 1994 (CDC, 2003). The first comprehensive recommendations were released in 1993 by the Centers for Disease Control and Prevention. It's everybody's responsibility to implement the (IPC) protocol because it does not protect only the client but it also protects the dental health care provider (DHCP) and the whole community as well (CDC, 2003).

If the staff in any clinic doesn't follow the protocol of the IPC, there will be a great risk on the client, HCP, and the whole community. Health care associated infections cause significant morbidity and mortality and at least 30% of health care associated infections Approximately 20-30% of the nosiocomial infection can be preventable by the infection prevention practices and measures (CDC, 2003). According to surveillance done in European hospitals in 2005, approximately 50,000 deaths occurred as a result of infection every year. The most common infection was urinary tract infection (28%), second is upper respiratory tract infection (25%), surgical site infection (17%), bacteremia (10%), and others, Hospitals in Europe linked to infection control through surveillance, improving patient safety in Europe (IPSE Annual Report, 2006).

2.4. The impact of compliance with the IPC protocol practices

The impact of the IPC protocol practices has two main categories as the following.

Health impact: The first benefit of using and adhering to the IPC protocol practices is to save lives and reducing the morbidity and mortality rates due to infection from dental clinics, and reduce the spread of infection. The aim of IPC is to protect the health of the client, DHCP, community and environment .To achieve such protection the DHCP should carry out infection prevention procedure within a strategy of standard precaution. Infection prevention includes all of the strategies and practices used to avoid the spread of infectious diseases. Practices such washing hands between every patient ,wearing gloves, putting on masks, wearing the goggles ,hepatitis B vaccination , decontamination and proper instrument processing, proper storage, use of the antiseptic agents ,use safe work practices (Duggan, 2008).

Second health system impact, Compliance will save resources by reducing the number of infection cases in the country and decrease the number of people who will seek medical care after they got an infection and which will increase the burden on the health system. Compliance with the IPC principles will increase the client confidence in the dental team and health care facilities, because patients are always seeking high quality care performance. Hospitals associated infections are associated with morbidity, extended hospital stay, and attributed costs to the health care system. Hospital acquired infections are a costly problem patients and health services alike (Kim et al. 2001).

2.5. Infection prevention and control definition

Infection control is defined as a various practices used by the health care provider in order to reduce cross infection and restrict its spread. IPC is very important to both the client, care provider and the whole community as well. Because of its importance it's good for all DHCP to comply with these practices (WHO, 2007). Another definition is given by CDC it's some measures carried out by the health care provider in order to reduce the transmission of infectious agents and these measures include many practices as washing hands between each client, wearing gloves, goggles and other protective barriers (CDC, 2003).On the other hand many defined it as the methods used to control and inhibit the

spread of infectious diseases and it is the responsibility of all DHCP (Tietjen, 2003). Concerning the infection chain, by using the infection control practices in a proper way, we can break the chain from any of its links, and thus we will reduce the spread of infection and inhibit the number of pathogens.

Infection control is a dynamic and ever-changing subject and all DHCP should be kept aware of the most up-to-date procedures required to prevent the transmission of infection. DHCP should understand why these procedures are necessary. Unless precautions are followed, there is a high possibility that patients and Dental Health Care Personnel (DHCP) will be exposed to blood-borne and other potentially pathogenic infectious materials (Gillian, 1999). By understanding principles of disease transmission and using infection control practices, dental personnel can reduce the chance for infection and prevent disease transmission. Adequate precautions for infection control should be in place for protection of both dental staff and patients. Sterilization, disinfection and barrier protection are universal precautions. Unique nature of most dental procedures, instrumentation, and patient-care settings call for specific strategies directed to the prevention of transmission of pathogens among dental personnel and their patients; "universal precautions", must be evaluated routinely in the care of all dental patients (Gillian, 1999).

2.6. Component of infection prevention and control protocol practices

2.6.1 Compliance with standard precautions

Standard precautions are those practices to be taken by all healthcare workers when coming into contact with blood or body fluids from any patient. The term is used to describe the application of various practices and procedures that prevent exposure to, and exposure of, a wide range of micro-organisms e.g. person, contaminated body fluid, equipment. The application of standard precautions is essential to prevent the spread of antibiotic resistant organisms (Heudorf, 2005).

Body fluids are all capable of carrying potentially harmful bacteria and viruses. It is impossible to identify infected person from none infected and to recognize every person who carried such pathogens therefore all blood and body fluids must be treated with the

same precautions irrespective of any known or suspected infection or carriage with a pathogen (Shama, 2007).

Standard Precautions includes the major features of universal precaution and substance isolation and should be applied to all clients receiving care regardless of their diagnosis or presumed infection status. Standard precaution integrate that all secretions, excretions, non intact skin, and mucous membranes of ALL patients, regardless of the patient's diagnosis are contaminated all the time and we should deal with all the same way (CDC, 2003).

In a study conducted in Alexandria, Egypt, in 2008 about the infection control in dental clinics. The study results showed that there are lower percentages in wearing gloves among nurses (81.8%) compared with the dentist (100%) (Waheida, 2006). Regarding wearing mask, the study showed that, the dentists are wearing masks more than the nurses. 86.4% of nurses were changing gloves between clients but the doctors were 100%. The study revealed that 76.4% of nurses and all doctors 100% washed their hands after they removed gloves. Regarding the use of sharp boxes the study showed that the nurses used it more than the dentist and this was due to the nature of job for both of them. The overall result of compliance it seems that it is acceptable with dentist77.4% while it is poor with nurses 56.8% with high significant difference (Wahieda, 2006).

In Canada it seems that there is a great need for more education in order to promote the use of universal precautions by both general practitioners and orthodontists. Increased use of barrier methods, HBV vaccination of clinical staff, and heat sterilization of instrument is required to reduce the potential for cross infection in the orthodontic practice. This is particularly important with the increasing number of microorganisms that are resistant to antibiotics (Mac-Carthy, et al. 1997).

Al-Omari has conducted a study about the compliance of IPC in private sector in North Jordan. The result of this study indicates that 14 percent of general dentists in the sample were considered to be compliant with an inventory of recommended infection control measures. The researcher saw that in Jordan, there is a great need to provide formal and obligatory infection control courses and guidelines for private dentists by the Ministry of Health and the dental association in addition to distribution of standard infection control

manuals that incorporate current infection control recommendations. (Al-Omari et al, 2005)

In Jordan Qudeimat has conducted a study about assessing the knowledge and practices among dental staff and dental nurses at a university teaching dental center about infection control. It has been shown that compliance with recommended guidelines for control of cross infection varied among the 2 tested groups. A need exists for proper practice of infection control by both dental staff and dental nurses. (Qudeimat et al, 2006).

There was a study conducted in Islamic Republic of Iran showed that when they investigated knowledge of and practices towards universal precautions among 540 health care workers and medical students in 2 university hospitals in Meandering Province, the result was there was a low understanding of standard precautions. Good practices were reported regarding hand-washing ،disposal of needles, and glove, mask and gown usage a significant relationship between the respondents' knowledge and practices toward universal precautions was shown (Motamed, 2005).

2.6.2 Compliance with Hand washing:

In the mid-19 century the physician Ignaz Semelweiss was the first to discover that washing hands can prevent the transmission of bacteria and prevent diseases. Bacteria and viruses are commonly transmitted on the hands of health care workers, so hand washing is considered to be the single most important procedure for IPC. During daily work, dental health care workers can acquire pathogens from infected patients and transmit them to other patients. There are fewer data on the transmission of pathogens in the dental setting; however, given the number of bacteria and viruses found in the mouth and the nasopharynx and the potential for split of blood and saliva during dental procedures, it is likely that transmission is common in this setting as well (CDC, 2003).

The availability of high quality hygiene products will enhance and improve the adherence to recommended hand hygiene practices which will promote patient safety and prevent infectious diseases (Larson, 1995). Because of the difficulty of identifying infected persons, current recommendations for infection control are to treat all patients as if they are infected with blood-borne pathogens such as hepatitis B viruses (CDC, 2003).

In spite of these concerns, compliance with hand washing recommendation remains low in most health care settings and does not usually exceed 40%, even under controlled study conditions (Harris, 2000). Although dentists reported better and higher percentage of hand washing, are better, compliance in this group is still less than ideal (Harris, 2000). As we know there is normal flora in our hands we can't remove it but by washing our hands we will decrease the number of microorganisms, this is called resident flora but, there are microorganisms that is acquired by the contact of the patient every day, this is called the transient flora and by hand washing we will remove it all. Despite the fact that all DHCW should wear gloves to prevent the transmission of infection to patients and to prevent the contact of the DHCP's hand with blood and saliva, many dentist doesn't wash their hands after the removal of gloves (Mc-Carthy, 1995).

Boyce has found that there are several factors affecting the compliance with hand washing principles, these factors are availability of sinks, adverse effects of hand washing on skin condition like allergy to disinfectant soap, high workload and low perceived risk. Although continuing education is very useful intervention to improve compliance of dentist with hand washing, but also reinforcement and rewards will sustain the change in behavior. Compliance also depends on the time required to perform adequate hand washing relative to the time available (Boyce, 2002).

As mentioned before educational programs don't improve compliance with hand washing as it is recommended by itself. In addition to this we have to improve compliance by finding other ways of decreasing the time required for hand washing. Since health care workers often consider lack of time as one of the greatest obstacles to hand washing. Widmer and Voss estimated that the time necessary for hand disinfection with an alcohol gel was only 25% of the time required for regular hand washing (Voss, 1997). The use of alcohol gel has many advantages that encourage the dentist and other health care provider to use it these advantages are as follows, it doesn't need sink, can be put in convenient place, decrease the rate of contact dermatitis which exceeds 60% in health care workers who have to wash their hands more often (Voss, 1997).

A randomized cross-sectional study comparing soap and alcohol gels showed that the gels were associated with significantly less skin irritation and dryness. There is a significant increase in compliance with hand hygiene after the introduction of an alcohol-based hand disinfectant at a university hospital in Geneva, compliance with hand hygiene increased from 48% to 66%; they also found that this improvement was sustained. The improvement in compliance with hand hygiene recommendations associated with the use of alcohol-based products will decrease the risk of transmission of infection in the dental setting (Pitt et al, 2000).

Alcohol-based hand disinfectant should be used when the hands are not contaminated with blood or saliva which is rare in the case of dentist while they are wearing gloves all the time. In case of visible contamination of the hands happened, the regular hand washing should be performed. In the other hands the Alcohol-based hand disinfectant should cover the whole hands, fingers and the back of the hands. The bigger the hand the more Alcohol-based hand disinfectant is needed (Larson, 1995).

A study which was done by McCarthy comparing the compliance of dentist regarding infection control in Ontario, there is significant improvement in wearing gloves, masks, protective eyewear, vaccination against HBV and sterilization of instruments but there is no improvement in routine hand washing and most dentist didn’t adopt universal precautions. More education is needed to promote universal precautions, HBV vaccination for clinical staff, and hand washing (McCarthy, 1995).

Even there is high compliance among dental practitioner and dental nurses there still a great need for proper practice of infection control by both dental staff and dental nurses (Muawia, et al. 2006). Not only is the compliance of female greater than males with IPC but in care delivery and supervision as well (Gilloran, 1995).

Health care-associated infections considered one of the greatest challenges of health care settings. Despite the fact that proper hand washing can reduce the transmission of pathogens to patients and the spread of antimicrobial resistance, the compliance of health care workers to recommended hand-hygiene practices has remained below acceptable levels. One of the key elements in improving hand-hygiene practice is the use of an alcohol-based hand rub instead of washing with soap and water (Gilloran, 1995).

An alcohol-based hand rub requires less time, is microbiologically more effective, and is less irritating to skin than traditional hand washing, Therefore, alcohol-based hand rubs might be used when the hands are not visibly soiled. It is also important to change gloves between each patient contact and to use hand-hygiene procedures after gloves removal. Reducing health care-associated infections requires that health care workers take responsibility for ensuring that hand hygiene becomes an attitude (Askarian, 2006).

No one can deny that health care providers' hands have been recognized as major reservoirs of microorganisms that may cause infections. And no one can deny that washing hands with soap and water has been the primary method of hand cleansing. Factors that can increase compliance with hand hygiene were summarized by Ronnie Myers, as, continuous education of the staff members, being a model, motivation and rewards for compliant worker, modifying and improving of available instruments, updating the administration policies, increase staff commitment to the right practice and continuous evaluation of the program. In a study conducted in New York State it seems that the majority of dentist wash their hands and know the CDC guidelines regarding control prevention and the hands hygiene (Ronnie, 2008).

One study has been conducted in Italy about hand decontamination and use of gloves in the intensive care units concentrating on the demographic characteristics and practices, the knowledge about hospital acquired infection prevention. The majority of the study participants showed a positive attitude toward hand decontamination and its effect on reduction of infection. It showed that 60% always decontaminate their hands at the beginning of the shift, 70% before and after the caring for the patients. The positive attitude are high significant among older female than others.

In an epidemiological study of HH carried out in 1994 in hospitals affiliated to the University of Geneva, was observed an average rate of compliance of 48%. This study identified as factors associated with a lack of compliance as professional category (nurses had higher rates of compliance than other professionals), high risk activities in units caring for patients in a critical condition, undertaking procedures with a high level of bacterial contamination, and an overload of work among healthcare professionals (Silva, 2005).

In another study, in a Spanish hospital about HH compliance and its associated factors, the average for compliance was 31%. This is very low, regarding that the observation was made after a period of health education on the HH and with the prior knowledge of the professional that they were being evaluated. The Atlanta Centers for Disease Control and Prevention (CDC) published an extensive review of recommendations for HH in healthcare institutions in 2002. It recommended using alcohol-based solutions, instead of washing hands with soap or antiseptic, in order to increase compliance with this action for the prevention of nosocomial infection (CDC, 2004).

2.6.3 Compliance with hand gloving

Gloves should be worn by all staff prior to contact with blood and body fluids from any client in order to prevent cross infections. Wearing gloves will prevent the transmission of pathogens from client to DHCP and vice versa (CDC, 2003).

Every DHCP should wash hands before and after using gloves because if there is a break in the glove, this may be present or occur during the consultation, thus creating a hazard. Every person has to choose the gloves which fit, comfort and suitable for the planned use. Gloves should be changed after each patient procedure or during treatment of the same patient if separate procedures are being performed and there is a risk of infection from one part of the body to another (CDC, 2003).The main reason for wearing gloves is to prevent contamination of the DHCP hands when touching mucous membranes, blood, saliva. It also reduces the likelihood that microorganisms present on the hands of DHCP will be transmitted to patients during daily care or other patient-care procedures. This doesn't replace hand washing before and after wearing gloves (Kearns, 2001).

A study which was conducted in Khartoum, Sudan in 2004, about the compliance of basic infection control procedures. The researcher saw that there is a need for improvement regarding immunization, sterilization and waste disposal. The result showed 100% response rate, the study showed that 92% of dentist wore gloves routinely when treating patients, 50% wore masks, (Elkarim, 2006).

The selection of gloves either sterile or examination depends on the task to be performed. Gloves should meet the standards of sterility. Certain studies have determined that there is no difference in postoperative infection rates after routine tooth extractions when surgeons wore either sterile or non sterile gloves, however wearing sterile gloves during surgical procedures is supported by a strong theoretical rationale. Sterile gloves minimize transmission of microorganisms from the hands of DHCP to patients and prevent contamination of the hands of DHCP with the patient's blood and body fluids. In addition, sterile surgeon's gloves are more rigorously regulated therefore might provide an increased level of protection for the provider if exposure to blood is likely (CDC, 2003).

Utility gloves are used for cleaning purposes such as cleaning of instruments and waste disposal. They offer more protection from penetrating injury and chemicals than non-sterile disposable gloves. Good quality utility gloves with protective linings are recommended for comfort and to absorb perspiration (CDC, 2003). Alternatively, clean cotton gloves can be worn under the utility glove. Utility Gloves should be labeled with the users name, washed with water and detergent, rinsed with waster, hang to dry and should be labeled with the user's name, dispose when showing tear or deteriorated, wearing gloves doesn't eliminate hand washing as it should be performed as soon as the gloves is removed as the hands could be contaminated during gloves removal (CDC, 2003). In addition, bacteria can multiply rapidly in the moist environments underneath gloves, and thus, the hands should be dried thoroughly before wearing gloves and washed again immediately after glove removal (CDC, 2003).

DHCP and dental patients with latex allergy should not have direct contact with latex-containing materials. The American Dental Association (ADA) began investigating the prevalence of type I latex hypersensitivity among DHCP at the ADA annual meeting in 1994. In 1994 and 1995, approximately 2,000 dentists, hygienists, and assistants volunteered for skin-prick testing. Data demonstrated that 6.2% of those tested were positive for type I latex hypersensitivity. Data from the subsequent 5 years of this ongoing cross-sectional study indicated a decline in prevalence from 8.5% to 4.3%. This downward trend is similar to that reported by other studies and might be related to use of latex gloves with lower allergen content (ADA, 1994).

Gloves must be worn for all clinical procedures and treated as single use items, so a new pair of gloves must be used for each patient. It is important that gloves fit properly. Gloves should be put on immediately before contact with the patient and removed as soon as clinical treatment is complete. Used gloves must be disposed of as clinical waste. There is a variety of gloves available for clinical procedures. Those selected should be good in quality non-sterile medical gloves worn for all clinical procedures and changed after every patient and should be well fitting and non-powdered (Kearns, 2001).

2.6.4 Compliance of Mask, uniform, face mask

Every DHCP should protect their eyes against foreign bodies, splatter and aerosols that may arise during operative dentistry, especially during scaling, the use of rotary instruments, cutting and use of wires and the cleaning of instruments. Eye protection should have side protection. A face shield can be worn over spectacles to give additional protection. (ADA, 2009).

Masks should be well fitted to effectively cover the mouth and nose, in accordance with manufacturer's guidelines. Masks should be worn during any sterile procedures, drilling of toe nails where dust is created, where a risk the transmission of airborne infection exists or during procedures where there is a risk of spraying or splashing of blood / body fluids. Masks don't protect the DHCP 100% from microbiological, but they protect them from splatters that contaminate the face. DHCP should wear masks (mouth and face mask) during all procedures and they are single use and must be changed after every patient. It shouldn't be used again and should be discarded and disposed as clinical waste (South Staffordshire IPC protocol, 2009).

The Journal of the American Dental Association suggests that the dentist should wear a gown or a uniform that covers his clothes in order to protect him from transferring infection from work place to home. This gown or uniform should be changed daily or when it became visibly solid. Protective eyeglasses and disposable face mask are also recommended in order to prevent transmission of infection. In fact, the more your dentist is protected, the more protected you will be. Of course we should always remember hand washing before and after treatment (ADA, 2005).

In a study conducted in Mary land state, USA, about the compliance with universal precaution in correctional health care facilities. The study showed that there is a decreased rate of compliance regarding the use of personal protective barriers as, (53.5%) were wearing protective eyewear, (47.2%) wore masks. While there was a high compliance with wearing gloves (93.2%) (Gershon, et al, 1995). The compliance as the researcher claimed was associated with several work related variables such as, job satisfaction, management commitment to infection control and safety program, and other factors. If these factors are

controlled, the chance for compliance and reduction of risk of blood borne exposure will be most effective (Gershon, et al, 1995). Between clinical sessions, work surfaces should be thoroughly cleaned and decontaminated with ethyl alcohol (70%). If there is visible blood or pus, the surface should be cleaned and disinfected with sodium hypochlorite (0.5%), followed by water rinse. Protective gloves should be worn and care taken to minimize direct skin, mucosal (Gershon, et al, 1995).

2.6.5 Compliance with instrument processing and sterilization

All instruments contaminated with oral and other body fluids must be thoroughly cleaned and sterilized after use. The decontamination process includes pre-sterilization cleaning, disinfection, inspection, sterilization and storage. Manufacturers are required to provide instructions for the decontamination of their equipment – these instructions should be followed. It is worth checking with the manufacturer prior to purchase that the equipment can be used for the purpose intended and decontaminated by the methods used in the practice (CDC, 2003).

New dental instruments should be fully decontaminated before use. Some instruments may require dismantling before cleaning and sterilizing. It is important to follow the manufacturer's instructions, especially if the new equipment is unfamiliar to those responsible for its reprocessing. A systematic approach to the decontamination of instruments after use can help to ensure that dirty instruments are separated from clean. After sterilization, instruments for immediate use can be put onto individual covered trays. At the end of each patient treatment, all instruments on the tray (used and unused) must be regarded as contaminated and reprocessed. At the end of the day, unused trays of instruments should be reprocessed before use. Keeping to a minimum the instruments put onto trays (CDC, 2003).

Effective cleaning of instruments before sterilization will reduce the risk of transmission of infectious agents. Wherever possible, cleaning should be undertaken by manual cleaning; manual cleaning should be considered where the manufacturer's instructions specify the device is not compatible with automated processes (CDC, 2004).

2.6.6 Waste disposal

Dental practices produce a large amount of hazardous and non-hazardous waste. If blood is spilled, it should be completely covered either by disposable towels, which are then treated with sodium hypochlorite solution which producing10, 000 ppm chlorine. (ADA, 2009). Good ventilation is essential. Allow at least 5 minutes to elapse before clearing and disposing of towels as clinical waste. The dental health care worker dealing with the spillage must wear appropriate protective clothing: household gloves, protective eyewear, and a disposable apron and, in the case of an extensive floor spillage, protective footwear (Barron, 2001).

All waste of the dental clinic must be correctly separated, packaged appropriately for transport, transferred to an Authorized Person for transport to an authorized waste site. Sharp instruments and needle should be handled with great care to prevent unintentional injury. Needles should never be recapped by using both hands in direct contact or by any other technique that involves moving the point of a used needle towards any part of the body (Hellgren, 1994).

2.6.7 Compliance with Immunization Standards

A study was conducted in a medical university in order to assess the knowledge, attitude and compliance to immunization guidelines among dental health-care professionals in Italy. 369 out of 1000 dentist responded. About 44.1 recognized all infections that they can acquire or transmitted during their daily activity. Older dentist showed a higher significantly than others they showed more knowledge about the importance of vaccine and the necessity to be vaccinated against Hep B and influenza viruses and they had a positive attitude towards vaccination. (85.7%) reported receiving the hepatitis B vaccine, but only 56.2% the three doses. Training and educational interventions are needed to improve knowledge and immunization coverage (Kamps, 2000).

2.7. Measures to increase compliance of infection control practices

There are many measures that can lead to increase compliance of employees with hand washing and other infection control practices. In a study about the employees opinion about how to improve their compliance with IPC practices some of them said that; rewards or punishments would not improve hand washing, but 80% reported that easy access to sinks and availability of hand washing facilities would lead to increase compliance (Harris, 2000).

One of the main causes of not washing hands are lack of time and work (Larson, 1995). Since alcohol-based hand rubs require much less time, it has been suggested that they might replace it with hand washing in order to resolve this problem. In fact, a recent study conducted to compare the time of hand washing and alcohol hand rub, suggested that, given 100% compliance, hand washing would consume 16 hours of nursing time per standard day shift, while alcohol rub would consume only 3 hours (Voss, 1997)

The physical environment and access to equipments can support and increase the efficiency and effectiveness of infection prevention and control practices (Garn, 1992). Ensuring supplies and equipment are available to support staff in infection prevention and control practices; and involving nurses in designing and implementing changes in infection prevention and control system, involving nurses in planning, implementing and evaluating infection control processes, designing the correct and appropriate use of personal protective equipment, Hiring a person to ensure that infection prevention and control policies and procedures exist; and providing appropriate educational resources, ensuring that infection control policies and procedures are up-to-date; and implementing health and safety programs for all staff, including programs for surveillance, treatment for contacts, screening and immunization (Garn, 1992).

Implementing a system to promote information sharing about infection prevention and control among all health care team members will enable the team to work in harmony. Professional development includes orientation and education related to infection prevention and control. Interventions to improve compliance, such as provision of an educational program (Jagger, 1995), (Gould, 1997), a motivational program (Miller et al.

1998), and patient educational programs (Garn, 1992), have been implemented. However, researchers have concluded that healthcare workers' hand washing compliance rates are difficult to change, having found compliance shifts equal to or less than 12% despite best efforts. It can, therefore, be argued that sustained improvement of compliance with guidelines requires a multifaceted approach incorporating cognitive, emotional and behavioral aspects, rather than an uninfected approach (Garn, 1992).

2.8 Islam and infection control

Islam is the one of the religions that cares for cleanliness and not only make it as apart of it, but also as apart of its assets. The first step to enter Islam is washing, even before saying no God but Allah and Mohamed is the prophet of Allah. No praying only after wodo'o (washing hands, face, heads, and feet) (Hamdan, 2010).

Islam has come for more than 14 centuries ago, at the time a person does not know anything about the importance of hygiene in fighting against diseases. It is not known what microbes or parasites are. Islam used these expressions in order to simplify things for people and address them in some minds and understanding and knowledge at the same time. Islam used these expressions linking hygiene ideology, and makes it an integral part of the teachings of faith and praying. It makes it as a part of faith in God, because the Holy Prophet - peace be upon him said-: (cleanliness is half of faith) which describe, and another saying is: (cleaning of faith) (Hamdan, 2010)

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Islam legislation cares about infection control a lot and blocked all the ways leading to it. This is clear in many parts of Qur'an and Sonah as follows; contagious patients should not be in with the healthy people and vice versa. As if Islam is talking about patient's isolation many years ago and makes it as a permanent low for Islamic nations. Our prophet Mohammad says that if you heard about plaque, don't go to place which is plaque in or, if you there don't get out. (See annex 8). About the leper He says; escape from the leper as one escapes from lion. Some people said that escaping from the disease implies weakness of faith and escape from God's well. Islam says no it's not and witnessed of what Omer (and he is one of the biggest sahaba of Prophet Mohammed) did when he refused to go to Syria because the plaque was there. The other Moslems told him if he is afraid and if he is

escaping from God's well, He wisely answered them "I'm escaping from God's well to God's well (Hamdan, 2010).

Islam called against rodents, and animals that can be the source of infection like rates, scorpions, snakes, and harmful insects like kalparghut, lice, flies, and street dogs. It is also hated in Islam to keep dogs at home without a legitimate needs such as hunting, or guard as it considered the saliva of the dog are not clean and full of organisms and Islam ordered us to clean the food pot that the dog eats from, seven times and the last one is by sand. It is discovered now days that the sand consist a material that can get red and kill the organisms which is present in the dog's saliva.

Islam called for general cleaning of the human body in order to prevent infection. Hands, feet, are considered the most important part of disease transmission, when going to the toilets, transfer garbage, and contaminated food. Sometimes the person himself may transfer the infection, worms to himself. Islam cares much for hand washing so it ordered nail cuts, clean hands and feet (see annex 8). Cleaning of nose, mouth and teeth also so important because after eating, some food stuck to the teeth and spoil there which cause teeth decay and bad odor to the mouth so it is very important to clean them and Islam ordered to clean mouth, nose teeth five times per day prior to praying time (Hamdan, 2010).

It's known that some infectious diseases are transmitted through dust, which is carried by wind and cause infection and the disease is transmitted from ill persons to well through mouth, nose, drinks and food utensils. Some diseases are transmitted by droplets like Flu, Polio, and Diphtheria. Islam asked Moslems to cover their food pans and close the water bottles so dust, flies, or microbes will not reach it (see annex 8).

Chapter Three

Methodology

Chapter 3

Methodology

This chapter presents the study methodology. The researcher presents in this chapter description of study design, population, sample, place of the research, ethical consideration, and the instrument of the study. Furthermore, the researcher points at the applied pilot study and the study instruments, data entry and analysis, eligibility criteria, and limitation of the study:

3.1 Study design

This is a quantitative, cross sectional descriptive/analytical study, which tries to answer the study questions about assessing the infection prevention control "IPC" compliance and practices among dental health care providers at UNRWA dental clinics in the Gaza Governorates. Also it will assess the suitability of dental units to the IPC standards. This type of study measures the level and the differences of the variables of the phenomenon, which applied on a sample of the population in particular time and period. This design is chosen because it is useful for descriptive analysis. It is less expensive and enables the researcher to meet the study objectives in short time. It also studies the cause and effect at the same point of time and thus provides some possible indicators about causation relationship (Burns and Grove, 1997).

3.2. Study population

This is a census study as the researcher included the entire employees (dentist, nurses, dental oral hygienist) who were working in dental units at UNRWA primary health centers including job creation employees (JCP) in all Gaza governorates at the time of data collection. The total numbers of dental clinics are 21. There were 17 clinics having dental units and the other 4 dental clinics were mobile clinics which cover the school health. The total number of participants is 80 who are working in 21 dental clinics divided as follow; 48 dentists, 28 practical nurses, 4 oral hygienists; 63 of them were male while there were 17 females (Annual report, 2008).

3.3 Period of the study

The study was conducted in the year 2009; started with the literature review in August 2009 after obtaining the ethical approvals from the different sectors of UNRWA. The pilot study was conducted in October 2009. Data collection started directly after the pilot study at the end of November till the end of January 2010. Data entry and data cleaning was conducted in February 2010 and finally, data analysis and writing continued till June 2010. Submission was done in July 2020.

3.4. Setting of study

This study was carried out in all dental clinics in the primary health centers at UNRWA in Gaza Governorates. These clinics provide dental care services in Gaza Governorates. In total, 21 dental clinics, 4 of them are ambulatory clinics covering the whole Gaza Governorates UNRWA schools (north, middle, and south) were assessed. The rest of them are in the primary health centers

3.5. Eligibility Criteria

3.5.1. Inclusion criteria

The study included all dental health care providers who were working at UNRWA primary health centers (Regular and job creation employees) at the dental clinics in the five governorates of Gaza at the time of data collection. In total, 21clinics, 3 are ambulatory and 18 are in the health centers.

3.5.2. Exclusion criteria

-Employee who were in annual leave and/or abroad at the time of data collection.

- Females who were in maternity leave at the time of data collection.

3.6 Ethical and administrative Considerations

- An approval letter was obtained from Helsinki Committee (Annex 6).
- The study proposal has been approved by the School of Public Health

- Approval was obtained from the UNRWA management (Annex 7).
- Informed consent and explanatory letter were obtained (Annex 8)

3.7. Construction of the questionnaire

In this study more than one tool were used in order to ensure creditability of information as well as to meet the study objectives. First instrument was interviewed- questionnaire. The questionnaire was designed by the researcher, based on the literature review and field observation in consultation of experts in this field and with great support of the supervisor. The questionnaire was implemented in the English language were subjects because it is interviewed one and was filled by the researcher herself. When analyzing the data the questionnaire was divided into six parts (Annex 3).

- The first one is about the IPC related variables**.** This part is concerned with the knowledge and practices about the IPC (Annex 3)
- The second part is about the availability of the IPC protocol and its use at dental units.
- The third part deals with supervision and the implantation of the protocol. Also it illustrates the role of the administration in follow up and evaluation of the IPC program.
- The fourth part is the availability & shortage of materials and supplies. This will show the correlated factors relating to noncompliance and if it is related to the shortage of material and supplied or not.
- The fifth one included one important open ended question which asked about the DHCP's opinion in actions needed to be done in order to increase their compliance with IPC practices.
- The sixth part is about the familiarity with the IPC principals and practices.

The second instrument was adopted from the Hanan Project. It was adapted by the researcher to fit the dental clinics in UNRWA health centers in Gaza governorates. This instrument was used to evaluate the DHCP compliance with some basic infection control practices. The IPC practices checklist was administered three times for each participant in three different times.

The third assessment tool was a structured checklist of the physical environment in the dental units in order to evaluate and see if the physical environment (System and supplies) fits IPC protocols or not.

3.8 Pilot Sample

The researcher applied the IPC questionnaire and checklist of practices of this study on a 10 subjects as a pilot. The pilot was done to identifying possible problems in the design of wording, format of the questionnaire and clarity. Mild modifications and revisions in some parts of the study tools were done according to the pilot study. Pilot questionnaires were included in the study.

3.9 Data collection

Data were collected by the researcher herself. The researcher visited all primary health centers in the five Gaza governorates and conducted an interviewed questionnaire. Each questionnaire contained an explanatory letter clarifying the aim of the study, the way to fill the questionnaire, and measures to ensure the confidentiality (Annex 3). Checklist of the IPC practices is administered three times for each provider by the researcher herself. The checklist of the IPC instrument and supplies were done on the same day of data collection of the interviewed questionnaire. On average the time needed to complete the questionnaire is about 25 minutes**;** the average time for observing IPC practices is one hour per each participants.

3.10 Response rate

The response rate was 100% as all the 80 DHCP were interviewed by the researcher and the three times checklist were done for them all.

3.11. Reliability and Validity

Validity and reliability is very important in any research. Validity is defined as " the extent to which a measuring instrument measure what it is supposed to measure' (Bachman, 1996). When instruments measure what are they suppose to measure, this is considered very important for their reliability and this start with conceptual relevance and simplicity of the instruments. In this study Content Validity Index

(CVI) were used to rate the relevance of the questionnaire. The technique of measuring variables must be reliable as this reflects the extent to which an operational definition, questionnaire or other instruments is stable and consistent. So, a measure is reliable, if it gives the same results each time the situation or the factor is measured. General measures of reliability and validity were implemented including;

- Standardization of data collection tools.
- Standardization of implementation methods.
- Systematic checking and follow up of data collected.
- Data collection was done by the researcher herself.
- Data cleaning and checking.

3.12. Data entry and analysis

After data collection, questionnaires and checklists were overviewed. The researcher used the SPSS computer program Version-11 for data entry of the coded questionnaires. Cleaning and analysis that are used in the pilot study and determined the validity and reliability of the instruments using correlation coefficient to estimate internal consistency validity, and Cronbach's alpha equation to estimate reliability.

- The questionnaires and the checklists were coded and entered by statistician
- Cleaning and recoding
- Frequency distribution
- Calculation scores of different variables
- t-test for comparing the means between variables which have only two categories
- One way ANOVA test for comparing the means between variables having more than two categories.
- Chi square to compare the differences between categorical data

3.13. Limitations

- Frequent cut of electricity affected the ability to accomplish the work in a timely

manner.

- Limited resources like books and journals.
- The instruments tools are relatively long as it covers many concepts and there were more than one tool.
- The studied PHC clinics were only the UNRWA clinics; the other PHC clinics (MOH & NGOs) were not included.
- The study used a checklist of the IPC practices and the Hawthorne effect may affect their behaviors.

Chapter Four

Results & Discussion

Chapter Four (4) Results & Discussion

4. Results & Discussion

In this chapter the researcher describes the results and findings of the study. It presents the results of statistical analysis. The results show the characteristics and the distribution of the respondents of questionnaires from the 21 HCs included in the study. In addition, the analyses illustrate the relationship between some variables in regards to infection prevention and control practices. Some findings were also compared with other studies' findings. Different analytical statistical tests were used to illustrate the relationships between some IPC variables and other variables in the questionnaire as described below.

4.1. Socio demographic Characteristics

The total numbers of the population selected for the current study were 80 participants working in the dental clinics at UNRWA's primary health centers in Gaza Governorates with different personal profiles. The number of questionnaire interviewed was 80. Table 4.1 summarizes some important personal variables that were found in this study such as; gender, age, marital status, place of graduation, years of experience in dental field, work in other organization, district, having private clinic and others.

Table 4.1 shows that gender was distributed as follows; the majority of the study population were males (87%). In contrast, females represented 21%. Nowadays UNRWA is paying special attention toward gender awareness and women empowerment. So, this variation in gender may change in the coming years. This result also agreed with study which conducted in Gaza about compliance with infection control in intensive units in governmental hospitals which showed that the majority of the study population was males 66.5% while the females represented 33.5% (Awad, 2009). The PCBS report indicates that the female participation rate in labor force in the year 2000 was estimated to 10.4% (PCBS, 2006).

Table 4.1: Distribution of the dental health providers by characteristics variables

Variables	No	%
Gender		
Male	63	78.7%
Female	17	21.3%
Total	80	100%
Age group		
20-29	34	42.5%
30-39	16	20%
40-49	20	25%
50-60	10	12.5%
Total	80	100%
Marital status		
Married	68	85.0%
Not married	12	15.0%
Total	80	100%
District		
North	18	22.5%
Gaza	16	20.0%
Middle	19	23.8%
Khanyounis	13	16.3%
Rafah	14	17.5%
Total	80	100%
Profession		
Dentist	48	60.0%
Nurse	28	35.0%
Oral hygienist	4	5.0%
Total	80	100%
Place of graduation		
Arab countries	36	45%
Palestine	27	33.8%
Foreign countries	17	21.3%
Total	80	100%
Years of experience		
Less than 10 years	46	57.5%
More than 10 years	34	42.5%
Total	80	100.0%
Highest grade awarded		
Diploma	26	32.5%
Bachelor	50	62.5%
Master	4	5%
Total	80	100%
Type of employment		
Regular	37	46.3%
Job creation	43	53.8%
Total	80	100.0%
Work in other organization		
Yes	35	43.8%
No	45	56.3%
Total	80	100%
Having private clinic		
Yes	21	26.3%
No	59	73.8%
Total	80	100.0%

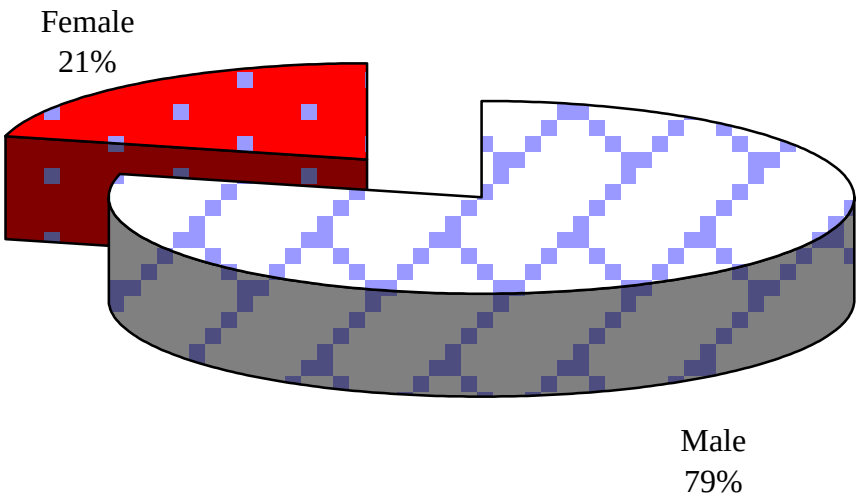


Fig. 4.1: Distribution of participant by gender

Regarding the age we can see in table 4.1, figure 4.2 that the majority of the study population ages are ranging among 20-59 with mean of 35.6 years. This study was in agreement with Omolara who conducted a study in Nigeria and the study population ranged from 20-50years (Omolara, 2008). More than two thirds of the respondent ages were less than 40 years old. This young generation represents an opportunity for investments in the young generation for the development of dental care services in UNRWA as those most likely will work for long time. The other highest group was 40-49 which represented 25% of the total respondent. If we want to talk about the marital status, it seemed that the majority of the participants are married (85%) and the rest are not married

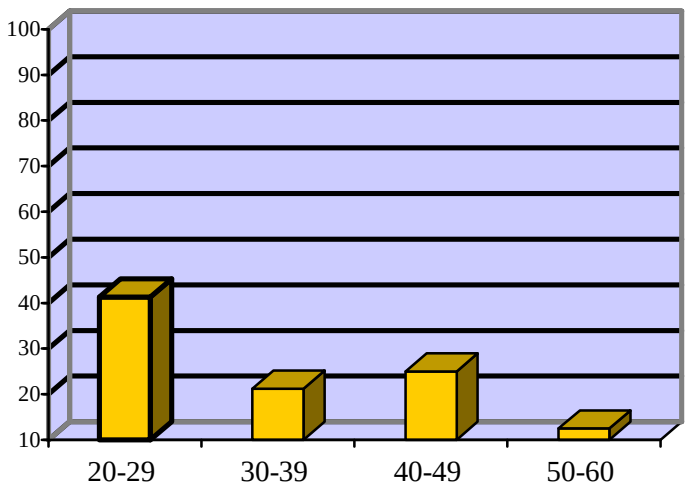


Fig. 4.2 Distribution of participant by age group by years

Regarding the distribution of the participants according to the district we can see from the table 4.1 that all districts almost the same number of employees and they are ranging from 13-18 DHCP. But if we want to compare it by the clinics, we can observe that the health centers are divided into two types regarding the dental care. First the big clinics that cover larger population and have two shifts, morning and evening have more DHCP than the second the smaller clinics that cover smaller population and have one shift. Also it depends on the number of clinics present in each district as example Rafah district has only two clinics 14.3%, but the middle district has 4 clinics 23.8%. The study indicates that 18 persons of the study sample were from the North 22.5%, 20.0% from Gaza, 23.8% from the Middle, 16.3% from Khanyounis and 14 of the sample were from Rafah 14.3%.

Regarding the DHCP profession, the participants are divided into three main categories, dentist 60.0% 21 of them are regular employees (those whose their contract is renewed automatically each year and have fixed salary) and 23 are job creation (JCP) (whose contract is only for one year and no renewal for them), the other category was the nurses 35.0%, 8 of them are regular and, 20 are JCP. The distribution is in agreement with the study of (Qudeimat, 2006) which was conducted in Jordan about the infection control knowledge and practice among dentists and dental nurses at the Jordanian University teaching center. His study revealed that the percent of dentists was 48 while the number of dental nurses was 28 and the third group which is the lowest was the oral hygienist 5% and all of them have a regular job.

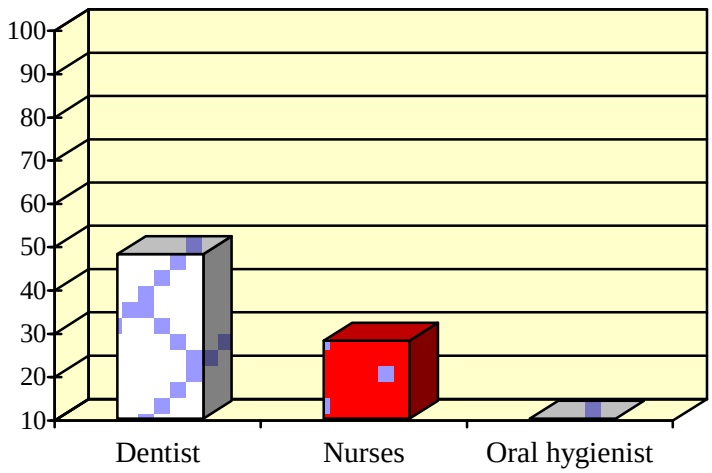


Fig. 4.3: Distribution of participants by type of profession

Regarding the place of the participants' graduation, table 4.1 shows; the majority of them have been graduated from Arab countries (45.0%). The second place of graduation is Palestine 33.8% and this high percent represents the nurses more than dentists because no dentists were graduated from dental universities in Gaza yet. The lowest value is foreign countries which equals 21.8%. Regarding the total years of experience, the researcher divided them into two categories as follows the majority of the participant are less than 10 years in experience 57.5%. This high percent also may be because there are many JCP employees working in dental units. These results are in consistent with (Motamed et al, 2004) which revealed that the majority of the sample population has less than 15 years of experience. This young generation may stimulate the decision makers to do more workshops, training, education, improvement and development. The rest are more than 10 years of experience and they represented 42.5%.

Regarding the level of education, the majority of the participants have had Bachelor degree (62.5%). This big number may be due to the large number of dentists in the study population as each dentist at least should have a Bachelor degree in order to practice dentistry. Diploma degree represented 32.5% while the master degree represented the lowest percent (5%) of the total study population and all of them are dentists. The demographic changes and variation may affect the compliance (Pittet, 2002). As he mentioned in his study that the demographic variation is strongly affect the adherence to hand hygiene practice. These factors include professional category, gender, and place of work (Awad, 2009).

Regarding working in other organizations other than UNRWA, it is obvious that the participant working in other organizations accounted 43.8% while the rest are not 56.5%. Table 4.1 showed that 26.3% of the total population and they are mainly doctors do have a private clinic while 73.8% don't.

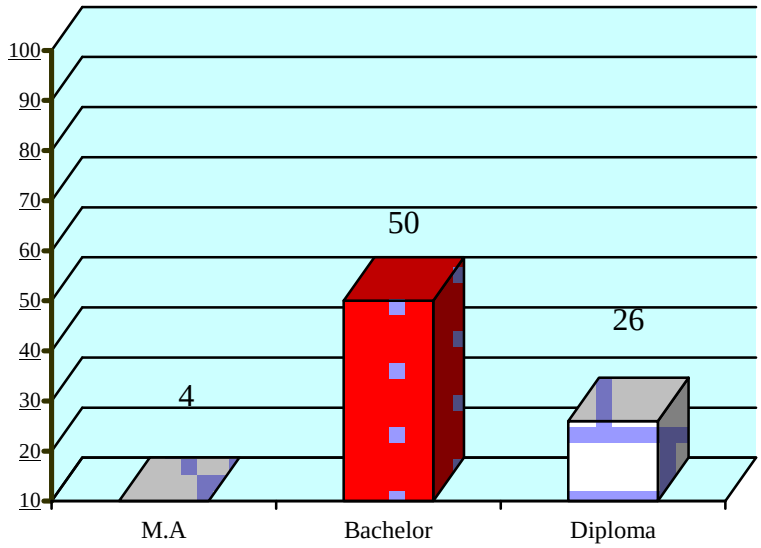


Fig. 4.4: Distribution of participants by the level of education

4.2. Distribution of IPC dimensions

4.2.1. Infection prevention and control related variables

As illustrated in table 4.2 regarding the IPC related variables, by asking the participants about their participation in the IPC protocol preparation, the majority (93.8%) answered no and the rest (6.2%) answered yes but those who participated in the IPC protocol had contributed to developing the IPC protocols other than the Palestinian one. Although UNRWA is a centralized organization and technical instructions come from the field office in Amman and distributed to its five fields (Gaza, West bank, Syria, and Amman, Lebanon), it involves its employees in decision making and technical issues such as protocols (UNRWA, 2008).

Because people always tend to be more committed to the issue they share in and believe in, it is important to involve them in decision making in order to increase their compliance (Mullin, 1999). Regarding the training of the participants, 50% of them have received training regarding infection control but the other 50% didn't receive any training courses regarding the IPC. This result was in agreement with the study conducted in Pakistan which showed that less than half of the DHCPs 49.6% had previous formal training on the infection control precautions (Syed, et al. 2009). In the past, the job creation employees were not involved in training sessions held by UNRWA or other places, but now the

regular and the job creation employees are involved in training courses related to all subjects that UNRWA organizes especially on the technical instructions (UNRWA, 2008).

Table 4.2: distribution of study population by infection prevention and control related variables

Variable	**frequency**	**Percentage**
Involvement in the preparation of infection control protocol (any related protocols)		
Yes	5	6.2%
No	75	93.8%
Total	80	100%
Receiving any training courses on the IPC protocol practices		
Yes	40	50.0%
No	40	50.0%
Total	80	100%
Training is part of the in-service training in your facility		
Yes	3	7.5%
No	34	85%
DK	3	7.5%
Total	40	100%
The interest of employees in a training course about the IPC protocol practice		
Yes	76	95.0%
No	4	5.0%
Total	80	100%
Incorporation of training about IPC in the basic education curriculum		
Yes	57	71.2
No	23	28.8%
Total	80	100%
Values of IPC		
Improves quality of health care	2	2.5
Health workers protection	1	1.3
The two mentioned above reasons	77	96.2
Total	80	100%

Continuous training and educational programs are essential part of care in order to keep employees updated with the new knowledge. As it is written in the literature, one of the measures to increase the compliance is training and updating information (Hesse et al, 2006). Regarding the participant's opinion about training courses if it is part of the organization agenda, 42.4% of participants said it isn't. While the other 3.8% said yes and the rest (3.8%) didn't know. In fact, UNRWA doesn't do arbitrary training but it does it according to need assessment (UNRWA, 2008). By asking the participants about their

interest to attend any training courses regarding the IPC protocol practices in the future, the vast majority 95% answered yes they are interested. The rest 5% answered no. Regarding the participant's basic curriculum if it is incorporated theoretical and training courses about IPC practices, 71.2% of them reported that their basic education has a course about the IPC practices but 28.8% reported no. Incorporation of the IPC practices in the basic curriculum of the DHCP and other HCP will help them to be familiar with it and its importance (Syed, et al, 2009).

4.2.2. Availability and use of IPC protocol

Table 4.3 shows that 37.4% of health centers don't have a copy of the IPC protocol, and 18.8% don't know if it is present or not, and those may be job creation employees. This is related to lack of orientation program about the technical instructions at UNRWA especially for the job creation employees. By the researcher observation only 10.0% of the total number of participants reported that they had the IPC protocol and showed it to the researcher. But, 33.8% reported that they had it but without showing it to the researcher. The researcher didn't insist for seeing it in order not to annoy participants. Regarding the place of the protocol, 2.5% reported that IPC protocol is at the shelf, 17.5% reported that it is in the drawer, 18.8% said it is present in the cupboard and the last 5.0% reported that they don't know where it is.

The availability of the IPC protocol in each clinic and even to each DHCP is very important and could increase the compliance and the knowledge of the employees. It will act as a job aid so that they can review it any time they want. Distribution of the IPC protocol copies and conducting specific policies and measures to enhance compliance will show the DHCP that their organization is serious about infection control which will encourage them to comply with it (Crispian et al, 2007). Lack of IPC copies will give the managers a hint to distribute it again to every HCP in all UNRWA clinics.

Regarding the use of the IPC protocol and its easiness in use, the majority of the participant (50%) reported that they used it always, 11.3% said that they used it sometimes and the rest (38.7%) they never used it in their clinics. 61.2% participants see the IPC protocol as easy and they can understand it well, the others 38.8% participants said that it

is to some extent easy in using the IPC protocol. This data confirm the need for training and some educational programs to be added to the UNRWA program and more follow up is needed.

Table 4.3: Distribution of study population by availability and use of IPC protocol

Variable		Frequency	Percentage
The availability of the IPC protocol in the clinic	Yes seen	8	10.0%
	Yes not seen	27	33.8%
	No	30	37.4%
	DK	15	18.8%
	Total	80	100%
Availability of the protocols (it's place in the clinic)	At the shelf	2	2.5
	In the drawer	14	17.5%
	In the cupboard	15	18.8%
	DK	4	5.0%
	NA	45	56.3%
	Total	80	100%
The use of IPC protocol at the facility you work at	Always	40	50.0%
	Sometimes	9	11.3%
	Never	31	38.7%
	Total	80	100%
The IPC protocol easiness in use	Yes to high extent	30	61.2%
	Yes to some extent	19	38.8%
	Total	49	100%
The presence of any problem in using of the IPC protocol	Yes many	7	4%
	Yes few	11	22.8%
	Not at all	31	63.2
	Total	49	56.3%
The main problems in using the IPC protocol, match all applicable answers	Insufficient knowledge	2	4%
	Insufficient training	18	36.7%
	Poor follow up	16	32.7%
	Work overload	6	12.3%
	Lack of time	7	14.3%
	Total	49	100.0%

In reference to the presence of any problem in using the IPC protocol, the majority (63.2%) reported that there are no problems in using the protocol. 4% reported that it has many problem, (22.8%) reported that it has few problem. The problems that have been reported such as insufficient knowledge 4%, insufficient training 36.7%, and poor follow up 32.7%,

work overload 12.3%, lack of time 14.3%. Any instruction or protocol that is easy in use and can be understood by others will encourage the employees to comply with it. This study is in agreement with the study conducted by Pittet which revealed that many factors affecting the employee's compliance with infection control practices. Of these factors affecting the compliance of protocols, lack of time, inaccessible supplies, lack of scientific information, work over load (Pittet, 2002). The presence of problems especially in the opinion of the employees, the main stakeholder, will render them from being compliant with the IPC protocol. In order to implement any protocol you need several things. One of these things is availability of the guidelines, policies and legislation (Awad, 2009).

4.2.3. Management related variables

Regarding the presence of dental supervisor the vast majority (98.7%) of the study population said that there is a dental supervisor. Only 1.3% said that they didn't have a supervisor. By asking the participants about if they were working as a supervisor in their clinics, only the regular dentists (26.2%) reported that they are performing a supervisor in their clinics. In UNRWA the regular dentist is the dental supervisor in the clinic and the job creation dentist or nurse is the supervisee. The other 73.8% said that they were not performing supervisory function. About the monitoring of the infection rate at the clinics the majority of the participants (83.7%) reported that monitoring is not being carried out. Only one clinic said yes and this was done due to a problem arise in that clinic.

The managers' job is to support, monitor, follow up, advice and evaluate the program which they are responsible about (CDC, 2003). Managers job is also to see if the supervisees follow the instructions they had, ask about the problems their subordinates face in using these instructions (pittet, 2002). So it is very important for the manager to do regular follow up and monitoring for their supervisee. Regarding if the manager carries an evaluation of the IPC practices in the clinics or not, the majority of the study population (98.7%) reported that there was a dental supervisor. A supervisor evaluates their IPC practices in all UNRWA clinics. The supervisor used the observation method most of the time as an evaluation tool and gave verbal feedback about the employees practice. This is in agreement with Henderson who said that strategies and tools to evaluate the infection-control program can include periodic observational assessments, (Henderson et al, 1987).

This study is in consistent with a study conducted by Sofou who concluded that, successful infection-control program depends on developing standard operating procedures, evaluating practices, routinely documenting adverse outcomes and work-related illnesses in DHCP, and monitoring health-care--associated infections in patients (Sofou, 2002). This may give the supervisor a hint about the importance of orientation program for new employees working in dental clinics and other health center places either for regular or job creation employees.

Table 4.4: Distribution of study population by management related variables

Variable		Frequency	Percentage
The presence of a dental supervisor in your work	Yes	79	98.7%
	No	1	1.3%
	Total	80	100%
Supervising other employees' performance in your center	Yes	21	26.2%
	No	59	73.8%
	Total	80	100%
The presence of monitoring system about infection rate in your facility	Yes	1	1.3%
	No	67	83.7%
	DK	12	15.0%
	Total	80	100%
The use of findings of monitoring infection rate in improving infection control practice?	Yes always	1	1.3%
	DK	79	97.4%
	Total	80	100%
The presence of a follow up/supervision regarding the infection prevention implementation in your clinic	Yes	76	95.0%
	No	4	5.0%
	Total	80	100%
The type of evaluation tools done in your organization	Observation	76	95.0%
	DN	4	5.0%
	Total	80	100%
The type of feedback received after your supervisor's visit regarding your IPC practices in the clinic	Yes verbal	76	95.0%
	Not at all	4	5.0%
	Total	80	100%
Action taken by you towards the feedback.	Keep it in the files	1	1.3%
	Discuss it with others	62	81.6%
	Use in Developing the work	13	17.1%
	Total	76	100%

When asking about what they do with the verbal evaluation, the majority (81.6%) said that

they discuss it with the concerned people and 17.1% reported that they used it in developing the work. This is the benefit of feedback is to discuss it together and see where are the weak points and avoid them and the strong points and empower them.

4.2.4. Availability and shortage of materials and supplies in the dental clinics.

By the observation of the researcher there is no shortage in the basic material and supplies in the dental units in both the ambulatory and dental clinics which are present in the health centers. At the same time there are shortages in some essential items. This may be is related to being not available in the field pharmacy. These items are alcohol with glycerin, towel papers for beds, face mask and aprons and these are so essential to prevent infection (CDC, 2003). This might be a point to discuss with the top managers in order to make these items regularly available. Another reason for non availability of some items is related to political reasons as the borders are closed and the Israeli military are not allowing materials to be entered to Gaza Governorate.

Table 4.5: Availability of materials and supplies in the dental clinics

Variables	Available		Sometimes		Rarely		NA	
	N	%	N	%	N	%	N	%
Sterile gloves	72	90%	-	0.0%	3	3.8%	5	6.3%
Alcohol with glycerin	-	0.0%	-	0.0%	1	1.3%	79	98.8%
Mouth mask	75	93.8%	2	2.5%	1	1.3	2	2.5%
Bleach	78	97.5%	2	2.5%	-	0.0%	-	0.0%
Plastic bags	75	93.8%	5	6.3%	-	0.0%	-	0.0%
Towel papers for beds	-	0.0%	-	0.0%	-	0.0%	80	100.0%
Suction tubes	65	81.3%	4	5.0%	-	0.0%	11	13.8%
Employee vaccination (Hepatitis B)	80	100%	-	0.0%	-	0.0%	-	0.0%
Garbage cans	80	100%	-	0.0%	-	0.0%	-	0.0%
Steam autoclave	74	92.5%	-	0.0%	-	0.0%	6	7.5%
Dry autoclave	78	97.5%	-	0.0%	-	0.0%	2	2.5%
Plastic paper to wrap instrument	78	97.5%	1	1.3%	-	0.0%	1	1.3%
Lab coats	80	100%	-	0.0%	-	0.0%	-	0.0%
Face mask	1	1.3%	-	0.0%	-	0.0%	79	98.8%
Aprons	-	0.0%	-	0.0%	-	0.0%	80	100.0%
Cabinet for storage	80	100%	-	0.0%	-	0.0%	-	0.0%

4.2.5. Knowledge, attitude and practices with IPC practices and principles

Regarding the participant knowledge about IPC practices, as seen in table 4.6 the whole study population 100% know that infection control practices reduce the chance of cross infection, and IPC Practices are essential for dental health care providers. This result are in consistent to the results of Omolara in 2008 which have shown that while the knowledge level of the dentists was generally acceptable, there were still some misconceptions on some of the IPC principles. Almost the whole population except two 97.5% realized that the IPC practices don't decrease their creditability at work (Omolara, 2008)

The majority of the participants know that the decontamination solution shouldn't be changed every other day. The knowledge about the ability of sterilization to kill all microorganisms including the end spores the majorities 70% of the participants don't know that, but 30% do know that it does. Most of the participants, 63% do wrap instruments as tight as possible before sterilization and they don't know the exact time for the unwrapped instruments in the dry autoclave when sterilizing them. The study which conducted in Egypt showed that there are lower percentages in wearing gloves among nurses 81.8% compared with the dentist 100% (Waheida, 2006) 86.4% of nurses were changing gloves between clients but the doctors were 100%. The study revealed that 76.4% of nurses and all doctors 100% washed their hands after they removed gloves (Waheida, 2006).

The majority of the participants (73%) do use the gloves for more one client without changing them especially if there is shortage in them. This behavior is due to lack of knowledge about the importance of changing gloves between clients. The main reason for wearing gloves is to prevent contamination of the DHCP hands when touching mucous membranes, blood, and saliva. It also reduces the likelihood that microorganisms present on the hands of DHCP will be transmitted to patients during daily care or other patient-care procedures. This doesn't replace hand washing before and after wearing gloves (Kearns, 2002). This Study is in agreement with the study conducted by Askarian which showed only 17% of the respondent were wearing gloves between patients (Askarian et al, 2002), while 77% where changing gloves between patients (Kohen, 2003).

Table 4.6: Distribution of the study population by their knowledge about IPC practices and principles

Variable	Yes		No		DK	
	N	%	N	%	N	%
IPC practices reduce the chance of cross infec	80	100.0%	-	0.%	-	0.0
IPC Practices are essential for dental health care provider	80	100.0%	-	0.%	-	0.0
IPC practices decrease the creditability at work	78	97.5%	2	2.5%	-	0.0
The time for autoclaving unwrapped instruments is 20 minutes	28	35.0%	44	55.0%	8%	10.0
If gloves are in short supply it is acceptable not to change gloves between clients	21	26.3%	59	73.8%	-	0.0
Glass container that contains toxic substances can be washed and rinsed and reused	19	23.8%	61	76.3%	-	0.0
Sterilization doesn't kill all microorganisms including bacterial endo spores	24	30.0%	56	70.0 %	-	0.0%
Familiarity with the concept of IPC standard precaution	45	56.3%	35	43.8	-	-
Knowing all components of standard precautions	45	56.0	35	44%	-	0.0%
Knowing the concepts of standard precautions	32	40.0%	11	13.8	2	2.6%

These results will encourage the top managers to hold an infection control courses for all the dental health care providers and do in service training in the dental clinics. Training program will enhance their knowledge, skills and promote practice. These results are inconsistent with a study which was conducted in Khartoum, Sudan in 2004, about the compliance of basic infection control procedures. The researcher saw that there is a need for improvement regarding immunization, sterilization and waste disposal. The result showed 100% response rate, the study showed that 92% of dentist wore gloves routinely

when treating patients, 50% wore masks, (Elkarim, 2004). When asking about the use of glass containers for other purposes when it is empted and decontaminated, 76% said no, they don't use it for other purpose

Table 4.7: Distribution of the study population by their attitudes about IPC practices and principles

Variable	Yes		No	
	N	%	N	%
If gloves are in short supply it is acceptable not to change gloves between clients.	21	26.3%	59	73.8%
Glass container that contains toxic substances can be washed and rinsed and reused.	19	23.8%	61	76.3%
The influence of IPC protocol on your practices at the clinic is positive	68	85. 0	12	15.0%

Table 4.8: Distribution of the study population by their practices about IPC practices and principles

Variable	Yes		No		DK	
	N	%	N	%	N	%
Decontamination solution should be changed every other day	8	10.0%	71	88.%	1	1.3%
Wrap instrument as tightly as possible before autoclaving	27	33.8%	51	63.%	2	2.5%
If gloves are in short supply it is acceptable not to change gloves between clients	21	26.3%	59	73.%	-	0.0%
Glass container that contains toxic substances can be washed and rinsed and reused	19	23.8%	61	76.%	-	0.0%
Documenting each client condition regarding infection or infectious diseases in the client file regardless to the number of visits he paid	78	97.5%	2	2.5%	-	0.0%
Usually assessment of the client and taking medical history regarding IPC before caring for them	77	96.2%	4	5.0%	3	3.8%
Waste containers can be used for other purposes if they are washed with 0.5% chlorine solution	77	96.3%	3	3.8	-	0.0

About their knowledge about the standard precautions, 56% said that they are familiar with this concept and of those 40% could define the term of standard precautions. When asking them about its components, 56% answered correctly and mentioned the whole component. But 54% said that they don't know it or heard about it. These results are in agreement with

the study conducted by Motamed which revealed that 65.8% of the total populations were familiar with standard precaution (Motamed, 2002).

64.3% of the respondents found to be familiar with standard precautions (Bamigboye et al, 2006). In another study, there was high knowledge about the term standard precautions as there are 92% of the respondents have knowledge about universal precautions (Hesse, 2006). In Canada, it seems that there is a great need for more education in order to promote the use of universal precautions by both general practitioners and orthodontists (Mac-Cathy et al, 1998). It is found that most of the DHCP practices are improved to high extent after using the IPC protocol and the other 15% their practice have been improved to some extent. 91% of the participants do assessment and take medical history regarding infection status and 97% of them document the finding before they care for them.

4.3. Inferential statistics

4.3.1 Use of Infection Prevention Control "IPC" and some variables among the study sample

To investigate the differences between the use of "IPC" practices and some variables, the researcher conducted chi square test. As shown in table 4.9, there were statistically significant differences between the use of "IPC" practices and having a copy of the IPC protocol (p= 0.001). 75.0% of participants who had a written copy of IPC showed high level of using IPC protocol in the proper way and 73.3% of those who don't have a written copy of IPC don't use IPC. There were also statistical significant differences between Use of IPC and its place of availability (p= 0.001) were 100.0% and 93% of the participants who said that the IPC protocol is in the cupboard or in the drawer were using IPC protocol more than others. There were statistically significant differences between the use of the IPC and having a dental supervisors among the study sample (p= 0.018).

However, there were no significant differences between the use of IPC protocol and profession (p= 0.922), gender (p= 0.947), and among who received training courses on IPC and those who haven't (p= 0.334), and having a monitoring system about infection rate (p= 0.457).

Table 4.9: Differences of Infection Prevention Control "IPC" protocol Use and some variables

	Variables	Use of IPC practices						X^2	*P Value*
		Always		Sometimes		Never			
		N	%	N	%	N	%		
Profession	Dentist	24	50.0%	5	10.4%	19	39.6%	0.915	0.922
	Nurse	14	50.0%	3	10.7%	11	39.3%		
	Oral Hygienist	2	50.0%	1	25.0%	1	25.0%		
	Total	40	50.0%	9	11.3%	31	38.8%		
Gender	Male	31	49.2%	7	11.1%	25	39.7%	0.109	0.947
	Female	9	52.9%	2	11.8%	6	35.3%		
	Total	40	50.0%	9	11.3%	31	38.8%		
Receive training courses on IPC	Yes	23	57.5%	3	7.5%	14	35.0%	2.190	0.334
	No	17	42.5%	6	15.0%	17	42.5%		
	Total	40	50.0%	9	11.3%	31	38.8%		
Do you have a copy of IPC	Yes seen	6	75.0%	2	25.0%	-	-	*** 57.362	0.001
	Yes not seen	27	100%	-	-	-	-		
	No	5	16.7%	3	10.0%	22	73.3%		
	DK	2	13.3%	4	26.7%	9	60.0%		
	Total	40	50.0%	9	11.3%	31	38.8%		
Availability of IPC	At the shelf	1	50.0%	1	50.0%	-	-	*** 55.190	0.001
	In the drawer	13	92.9%	1	7.1%	-	-		
	In the cupboard	15	100%	-	-	-	-		
	DK	4	100%	-	-	-	-		
	NA	7	15.6%	7	15.6%	31	68.9%		
	Total	40	50.0%	9	11.3%	31	38.8%		
Have a dental supervisors	Yes	40	50.6%	8	10.1%	31	39.2%	* 7.989	0.018
	No	-	-	1	100%	-	-		
	Total	40	50.0%	9	11.3%	31	38.8%		
Have monitoring system about infection rate	Yes	1	100%	-	-	-	-	3.637	0.457
	No	34	50.7%	6	9.0%	27	40.3%		
	DK	5	41.7%	3	25.0%	4	33.3%		
	Total	40	50.0%	9	11.3%	31	38.8%		

*p< 0.05 **p< 0.01 ***p< 0.001

4.3.2 Training on Infection Prevention Control protocol and some IPC variables among the study sample

As shown in the above table; there were no significant differences between receiving training on Infection Prevention and Control and knowing that the decontamination solution should be changed daily (X^2=1.627, p= 0.443), and wrapping instrument as tightly

as possible before autoclaving (X^2=0.510, p= 0.775), and usually assessing the client medical history regarding IPC before caring for them (X^2=1.014, p= 0.798), and documenting each client condition regarding infection (X^2=0.000, p= 1.000), and noticing any problem in using of the IPC protocol (X^2=2.071, p= 0.355). In contrary, there were significant differences between training on Infection Prevention Control protocol and familiarity with the concepts of the IPC standard precautions among the study sample (X^2=6.146, P= 0.024) were most of those who took training (70.0%) were found to be familiar with the concepts of IPC standard precautions. In addition, 57.5% of those who did not take training were familiar with the concepts of the IPC standard precautions.

Table 4.10: Differences in Training on IPC protocol and some IPC variables

Variable		Training on IPC protocol				X^2	*P Value*
		Yes		No			
		N	%	N	%		
Decontamination solution should be changed daily	Yes	3	7.5	5	12.5	1.627	0.443
	No	37	92.5	34	85.0		
	DK	-	0.0	1	2.5		
	Total	40	100.0	40	100.0		
Wrap instrument as tightly as possible before autoclaving	Yes	12	30.0	15	37.5	0.510	0.775
	No	27	67.5	24	60.0		
	DK	1	2.5	1	2.5		
	Total	40	100.0	40	100.0		
Familiar with the concept of IPC standard precaution	Yes	28	70.0	17	42.5	* 6.146	0.024
	No	12	30.0	23	57.5		
	Total	40	100.0	40	100.0		
Usually assess the client medical history regarding IPC before caring for them	Regularly	37	92.5	36	90.0	1.014	0.798
	Sometimes	2	5.0	2	5.0		
	Rarely	1	2.5	1	2.5		
	Not at all	-	0.0	1	2.5		
	Total	40	100.0	40	100.0		
Document each client condition regarding infection	Yes	39	97.5%	39	97.5%	0.000	1.000
	No	1	2.5%	1	2.5%		
	Total	40	100.0	40	100.0		
Have you noticed any problem in using of the IPC protocol	Yes many	2	8.0	-	0.0	2.071	0.355
	Yes few	7	28.0	4	21.1		
	Not	16	64.0	15	78.9		
	Total	40	100.0	40	100.0		

***p< 0.001 **p< 0.01 *p< 0.05

4.4 Important action needed to increase the dentist compliance with the IPC protocol

The table above shows that; 49 of the study population thought that training is the action that may increase the dentist compliance with the IPC protocol practices (46.7%), 22 thought that follow up and supervision may enhance compliance with the IPC protocols (21.0%), 19 said that instruments and supplies, that to provide the dental clinics with the needed supplies in order to make it suitable and capable for implementation of the IPC practices. 18.1% said that decreasing the workload and increasing the number of the employees in order to cover the increasing population and to give more attention to quality rather than quantity (8.6%).

Table 4.11: Important actions needed to increase the dentist compliance with the IPC protocol

Variable	N	**%**
Decrease workload	49	46.7%
Reward & punishment	22	21.0%
Instruments and supplies	19	18.1%
Training	9	8.6%
Follow up and supervision	4	3.8%
Conscious and ethics	2	1.9%
Total	105 responses	100.0%

More than one response is possible

4.5 Checklist results

4.5. Distribution of the study population according to IPC practices

As seen in table 4.18: The researcher demonstrated three times field observations for the IPC practices among dental health care providers at UNRWA health centers in Gaza Governorates. Hand washing is the foundation of infection control. It is the most important and the most basic technique in preventing and controlling transmission of infections. (Banning, 2005). It was obvious that 35% of the total population has washed

their hands between clients while more than the half 65% didn't wash their hands and this is very high percentage and indicates very low compliance with hand washing and hand drying.

This is inconsistent with the study conducted in Egypt and revealed that three fourth of the participants wash their hands between clients (Waheida et al, .2006). This makes it is very important to activate the monitoring and evaluation system in dental clinics at UNRWA. These results are supported with the opinion of Mac Donald who said that although dentists reported better and higher percentage of hand washing, compliance in this group is still less than ideal (Mac Donald, 2004). 6 % reported that they didn't wash their hands with soap or disinfect with an alcohol based hand gel. 71 % always washed with soap but never disinfected with an alcohol-based hand gel. In contrast 1% often disinfected with an alcohol based gel but never washed with soap. 22 % always washed with soap or disinfected with an alcohol-based hand sanitizer (Ronnie, 2008). This result may be giving the manager a hint to study the real causes behind not washing the hands between clients.

This study showed a high rate of routine use of gloves by dental health care providers. 76.7% of DHCP were wearing gloves when caring for clients. 23.3% were found not using gloves while caring for the clients. This is consistent with the study conducted by Cannata which showed high compliance with gloves use (Cannata et al, 1997). In contrast, it is inconsistent with what Muawia found that even there is high compliance among dental practitioner and dental nurses there still a great need for proper practice of infection control by both dental staff and dental nurses (Muawia et al. 2006).

Although the awareness about cross infection was high, this study showed a lack of general attitude in using the personal protective equipments (washing hands, gloves removal, mouth masks) during work according to IPC protocol guidelines, It is important that materials such as gloves should be available to dentists so that proper infection control procedures can be performed. The use of gloves reduces the risk of contamination 70 to 80 percent, helps prevent cross contamination and helps protect patients and providers (Cannata et al, 1997)

Table 4.12: Distribution of the study population according to IPC Practices

No.	Items	Yes		No	
		N	%	N	%
1	Hand washed with soap	84	35.0%	156	65.0%
2	Hands are dried with a clean towel	78	32.5%	162	67.5%
3	Gloves are worn when indicated	184	76.7%	56	23.3%
4	Utility gloves are worn when handling contaminated instruments	3	1.2%	237	98.8%
5	Gloves are removed by keeping outside surface	88	36.7%	152	63.3%
6	Lab coats are worn	236	98.3%	4	1.7%
7	Dental unit is cleaned with disinfectant solution (5% sodium hypochlorite)	63	26.2%	177	73.8%
8	All surfaces of the instruments are cleaned before further processing	180	75.0%	60	25.0%
9	Instruments are processed in the way it should be	184	76.7%	56	23.3%
10	Mask is worn when caring for the clients	188	78.3%	52	21.7%
11	Sharp materials are put in the sharp boxes	239	99.6%	1	.4%
12	The waste materials are put in a special bags with different colors according to the type of waste	119	49.6%	121	50.4%
13	The forceps for extraction is used for one client and then decontamination	235	97.9%	5	2.1%
14	Amalgam carrier are available for each client	91	37.9%	149	62.1%
15	A face mask is worn every time you check your patients	4	1.7%	236	98.3%
16	The turbine is cleaned between clients	116	48.3%	124	51.7%
17	The mirror which used for dental examination is changed between clients	157	65.4%	83	34.6%

Although wearing gloves offers a means of protection, it also creates a warm, moist environment in which organisms can proliferate. This situation results in a large increase in the amount of transient micro flora, so hand washing is essential to eliminate transient flora and decrease residual flora, even when gloves are worn (CDC, 2003).

Utility gloves are used for many purposes such as cleaning purposes, instrument processing, decontamination of instruments and waste disposal. They offer more protection of penetrating injury and chemicals than non-sterile disposable gloves so, it is very important to make them available all the time. Unfortunately UNRWA didn't provide these types of gloves in spite of its importance. The DHCP use the disposable gloves in cleaning and in disposing waste so this study may give the top managers an alarm to provide the clinics with the essential instruments and supplies which are considered the key in preventing and controlling the infection.

Another effective method of infection control includes gloving, masking, gowning, device handling, and other protective barriers (CDC, 2004). The study revealed that there were a low percentage rate in wearing other protective barriers such as face mask as there were only 1.7% of the participants who used face mask during patients care while 98.3 of them didn't wear it and this is due to lack of it in the field pharmacy at UNRWA. When asking the DHCP who used the face mask, from where they got it, they answered: it is self made as they cut the X-ray films, clean them and used them as a face mask in order to protect themselves from splashes that may transfer infection to them. Facemasks as other protective barriers are recommended for use when spatter and splash of body fluids are anticipated. The results in this study are lower than those studies in Nigeria and some other parts of the world which ranging 74% to 94%.

In contrast, the mouth mask and the lab coats are worn by the majority of the participants during work. 73.8% wore mouth masks, 26.2% didn't wear mouth mask. This is not consistent with the study done by Hadeson who reported a low percent of compliance with wearing the mouth mask during client care (Hadeson et al. 1995). The use of protective coats has been recommended to shield skin and clothing from splashes and spatter (CDC, 2004). In this study, 98.7% of participants always wear coats, while 1.3% didn't wear them.

Gordon has stated that disinfection is very important subject that attracts all dental infection control and is the focus of many studies (Gordon et al. 2001). In this study it is shown that the majority of the DHCP (73.8%) didn't disinfect the dental surfaces with Sodium hypo chlorine between clients; while 26.2% did disinfect the dental surfaces with

0.05% of Sodium Hypo chloride. The IPC protocol recommends that all surgical and other instruments that penetrate soft tissues and bone must be sterilized after use or discarded (MOH, 2004).

Regarding instrument processing, in this study, the majority of the dentists (73%) reported that DHCP do clean all surfaces of the instruments before further processing. Of those 73%, 77.5% of them processed the instruments in a proper way. This is supported with the opinion of Gould about decontamination who said: Always decontaminate reusable equipment between patients and discard single use items. Decontamination is a process intended to make the environment and equipment safe for their intended purposes (Gould, 1997). This result is quite good but it needs improvement in order to reach a high percentage of compliance and prevent infection as much as we can. The present study showed that there was a low percentage rate of disposing waste as only 49.6% of the total participants dispose waste in a proper way in different bag color. The other 50.4% didn't dispose waste properly.

The availability of supplies is the key element in the implementation of infection control so it is very important to provide the DHCP with all equipment needed for infection control before asking them to be compliant with any strategy. UNRWA tried its best to provide as many instruments as it can in order to decrease the chance for infection and this is obvious in providing mirrors to 65% of the total population and there is a need to increase this percentage to reach 100% (UNRWA, 2008). Dental practitioners in the present study also differ in their practice of changing instruments for every patient. 65.4% of the total participants changed the mirror between each patient while 34.6% didn't. Findings in this study is lower than the study which was conducted in Pakistan which revealed 85.1% of the un-qualified and 98.3% of the qualified dental practitioners use fresh set of instruments for each patient. It is advisable that UNRWA offers a new set of instruments for each client.

4.6. IPC practices and socio demographic variables

Table 4. 13. Differences in the IPC practices and socio demographic variables

Variable	Independent variables	Means	Source of Variance	Sum of Squares	Df	Mean Square	F-value	Sig. Level
IPC Practices	**District**							
	North	78.27	Between Groups	300.230	4	75.057	2.448	0.054
	Gaza	76.87	Within Groups	2299.758	75	30.663		
	Middle	78.31						
	Khanyounis	80.38						
	Rafah	82.64	Total	2599.987	79			
	Age							
	20-29	79.17	Between Groups	2.596	3	0.865	0.025	0.995
	30-39	79.37	Within Groups	2597.391	76	34.176		
	40-49	78.90						
	50-60	78.91	Total	2599.987	79			
	Profession							
	dentist	79.29	Between Groups	7.607	2	3.803	0.113	0.893
	nurse	78.71	Within Groups	2592.381	77	33.667		
	oral Hygienist	79.75	Total	2599.987	79			
	Level of education							
	Master	84.00	Between Groups	122.214	2	61.107	1.899	0.157
	Bachelor	79.24	Within Groups	2477.774	77	32.179		
	Diploma	78.11	Total	2599.988	79			
	Place of education							
	Arab	79.63	Between Groups	22.074	2	11.037	0.330	0.720
	Palestine	78.44	Within Groups	2577.913	77	33.479		
	Foreign	79.05	Total	2599.988	79			

In order to investigate the difference in Infection Prevention Control "IPC" Practices and some of socio-demographic variables of the study sample. Table 4.13 shows that: there were no statistical significant differences in IPC Practices according to the socio-demographic variables of the study population. This study is in agreement with the study conducted in Maryland State which showed that there were statistically differences between compliance and demographical variables (Mullin, 1999). In UNRWA this may be true because as mentioned before all health care provider should follow the technical instruction regardless to all socio demographic variables. Improving the system could have positive impacts cross board.

Table 4.14: Differences in the IPC practices and sociodemographic variables (by using t test)

Variable	Type of employment	N	Mean	Std. Deviation	t-Value	Sig. level
IPC Practices	**Type of employment**					
	Regular	37	79.10	6.145	0.006	0.995
	Job creation	43	79.11	5.434		
	Gender					
	Male	63	79.12	5.826	0.043	0.966
	Female	17	79.05	5.561		
	Marital status					
	Married	68	79.36	5.984	0.946	0.347
	Single	12	77.66	3.938		
	years of experience					
	12 and less	51	78.92	5.271	0.393	0.696
	13 and above	29	79.44	6.560		
	having private clinic					
	Yes	21	80.95	6.756	1.733	0.087
	No	59	78.45	5.236		

Independent t-test demonstrates the differences between Infection Prevention Control "IPC" Practices and some socio-demographic variables among the study sample. As shown in the above table; the result showed that there were no significant differences in IPC Practices and socio-demographic variables among the study population.

4.7. IPC System and Supplies Checklist at the 21 clinics of Gaza Governorates:

Table 4.15: availability of IPC Systems and Supplies Checklist (21 clinics)

No.	Items	Yes		No		NA	
		N	%	N	%	N	%
1	Paper sheets are available on all examination couches	-	-	21	100.0	-	-
2	Water source is available	21	100.0	-	-	-	-
3	A sink is available	21	100.0	-	-	-	-
4	Soap bars or liquid soap, are available	21	100.0	-	-	-	-
5	Towels or tissue paper are available	21	100.0	-	-	-	-
6	Plastic basins for decontamination are available	19	90.5	2	9.5	-	-
7	5% chlorine solution is available	21	100.0	-	-	-	-
8	Cleaning brushes are available for paper instrument cleaning	21	100.0	-	-	-	-
9	Utility gloves are available for proper decontamination and leaning	-	-	-	-	21	100.0
10	The steam autoclave is functioning well	18	85.7	-	-	3	14.3
11	Indicator tape is available	18	85.7	-	-	3	14.3
12	Sharp boxes are available in every room or area were sharps are used	21	100.0	-	-	-	-
13	Hazardous waste are managed separately from the other wastes	21	100.0	-	-	-	-
14	Toilets are available in proportion to beneficiaries	19	90.5	-	-	2	9.5
15	Toilet are clean	19	90.5	-	-	2	9.5
16	Infection prevention job aid charts are available	-	-	-	-	21	100.0

As shown in table 4.21 it seems that UNRWA provided all health centers with the essential instruments and supplies required to practice IPC safely. On the other hand, there are some supplies which are considered essential and basic to the IPC practices that UNRWA didn't provide which are utility gloves for decontamination, cleaning and handling instruments, face mask which is also considered essential to prevent the splash of the client saliva on the dentist eyes or face was not available in any UNRWA clinic except in one clinic which is Beit hanoun and this was a personal initiation from the dentist who where working at this clinic.

Infection prevention job aid charts were not available in all of the 21 clinics. Most of the other instruments and supplies were available in the clinics. It is important that dental

caregivers are provided with adequate infection control facilities to enable them deliver oral health care services with confidence and professionalism.

Chapter five

Conclusion

&

Recommendation

Chapter 5

5.1. Conclusion and Recommendation

The national IPC protocol has been developed to suit the Palestinian health context. This study will try to answer the main question which was asked before; to what extent the dental health care providers comply with the IPC protocol and the technical instruction in it. Also, it will help to identify any possible ways to improve the compliance of DHCP to it. On the other hand, the protocol must be updated every two to three years as recommended by the CDC in order to be up to date with the fast technology and the ever changing microorganisms which appear every moment. This study will help in highlighting many aspects related to the availability and use of the IPC protocol and therefore may help the top managers in UNRWA in developing procedures and updating of the protocol.

In order to evaluate the DHCP with the IPC protocol the researcher used three types of tools. First tool was an interviewed questionnaire which one of its purposes was to assess the knowledge, attitudes and practices of the DHCP, which reflect and affect their compliance with the IPC protocol. The second tool was an observation checklist of their practices during their work and this was to be sure that they practice what they know and believe during their work in the real. The third tool was the dental unit checklist which illustrates if the dental units are suitable for the IPC practices or not.

The sample in this study was all the DHCP in all primary health care clinics in all Gaza Governorate that are under the umbrella of UNRWA. It is a census study that takes the whole population. The study revealed that the problem with compliance of the DHCP is that the training of the employees is done randomly without regular basis. Regarding the attendance of training courses on IPC practices, the study indicted that 50% had attended training courses, while 95% are interested to attend further training courses. The compliance was in some areas good and the other areas showed a low level as the participants were not completely compliant with the most basic infection control practices such as hand washing, proper removal of the gloves, their knowledge is also not very good in all aspects related to IPC practices as most of them didn’t know the concept of standard precaution. However their attitudes toward the IPC practices is good, this may give the

managers a hint to improve the DHCP knowledge and practices by training courses, regular evaluation, distribution of educational materials relevant to IPC practices.

Despite of the distribution of the IPC protocol to all health centers, the availability of it at health centers is low (43.8%). This problem should be resolved by good dissemination plan and monitoring of the availability of the IPC protocol to all health centers; even to each health care provider in order to promote its use. Of those reported having a copy of the IPC protocol, 50% of them used it always at work. 32% of them found it is easy to use. Of those who found it not users friendly, 16.2% reported facing problems during implementation of the protocol. One of the biggest problems is poor follow up (42%) while the other problems are work overload, lack of time and insufficient training.

Regarding the availability of a job aid for the IPC procedures, it seemed there was no single health center had a job aid about the IPC practices and this also can be overcome by developing suitable job aids. Regarding the availability of the instruments and supplies and the suitability of the dental units to IPC practices it seemed there were no serious shortage in the basic things needed for the implementation of infection control practices but there were some essential things need to be available but UNRWA didn't bring them. These things are alcohol with glycerin, utility gloves, job aid, papers to cover the bed and to be changed between clients, and face mask to cover the whole face.

Regarding the IPC practices checklist, it seems that compliance level varies between low to high as sometimes it reached 100% as in instruments decontamination, wearing lab coats, and when dealing with sharps. On the other hand, it reaches 30% as in hand washing, hand drying and the decontamination of dental units with disinfectant solution. Some practices reached zero% in those materials were not available at the field pharmacy so they are not available in the clinics. The other practices are fluctuating between 40-80 percent and this is a good score.

When comparing the IPC practices checklist with the sociodemographic variables, it seemed that there were no statistically significant in differences between variables. These findings enabled the researcher to set the following helpful recommendation that the researcher see as contributing in increasing compliance with the IPC protocol.

5.2. Recommendations

- Improvements in IPC are necessary in dental practice. The introduction of mandatory continuing education about IPC may improve compliance with recommended IPC procedures, which is important because of concerns related to transmission of blood borne pathogens and drug-resistant microorganisms.
- The study concluded that training is vital intervention to improve compliance and adherence with the IPC protocol and to improve their practices. There is a great need for encouraging DHCP to be compliant with the IPC protocol by holding a training courses for the dental employees about infection control
- The study concluded that there are shortage in some materials such as face mask, utility gloves, job aid, and alcohol with glycerin. There is a great need to make them available.
- Revision, evaluation, and updating of the IPC must take place periodically with adequate involvement of the DHCP and concerned parties because if the employees shared in the updating of the IPC protocol they will adopt it and defend it as they can.
- To insure the availability of IPC copies and further dissemination of adequate number of copies should take place and should be followed by training, supervision and follow up
- An orientation program should be developed for the newly employed and the job creation employees in order to enable them to recognize the procedures and policies regarding the IPC protocol practices.
- Empowerment of official policies and procedures that are contributing in improving the adherence and compliance with the IPC protocol.
- Continuing education through infection control courses and infection control manuals which contain updated and recommended guidelines to ensure compliance.
- Development of written comprehensive policy on immunization of dental health care workers and development of a written program for dental health care workers that includes policies, procedures and guidelines on education and training, exposure prevention, and post-exposure management.
- More follow up and monitoring from the supervisor is needed
- Standardize guidelines for DHCP to increase their knowledge, as well as to create a practical guide to improve the HH process and guideline compliance. Further

education of the dental community is warranted to improve HH compliance, improve efficacy of HH practices and improve skin health.

5.3. Research recommendation

- There is a need for another study exploring the compliance level with the IPC protocol in the MOH and other NGOs and private sectors in order to have national figures in this regards
- There is a need for another study exploring the better ways to increase the DHCP with the IPC protocol from the DHCP point of view and their perspectives.

References

Al-Khatib IA, Darwish R. (2004). Assessment of waste amalgam management in dental clinics in Ramallah and Al-Bireh cities in Palestine. International journal of environmental health research, , 14(3): 179–83.

Al-Omari, MA. Al-Dwairi, ZN. (2005), Compliance with infection Control programs in private dental clinics. Jordan. "American Dental Education Association J, 69(6)☹693-698)

American Dental Association. (1988), Infection control recommendations for the dental office and dental laboratory. Journal of the American Dental Association.

Askarian M, Mirzaei K, McLaws ML. (2006). Attitudes, beliefs, and infection control Practices of Iranian dentists associated with HIV-positive patients. Am J Infect Control 34(8):530-533.

Awad, Nisreen , (2009)Compliance of the ICU workers with infection control protocol in Governmental hospitals in Gaza governorates,

Bachman and Palmer (1996) Validity, Reliability& Practicality

Barbra C .C, Lam, Y.L. Lau (2004):"Hand Hygiene Practices in a Neonatal Intensive Care Unit: AMultimodal Intervention and Impact on Nosocomial Infection" Pediatrics, 114(5): (565-571

Barron T. (2001)Dental mercury pollution prevention and waste management practices for the dental office. (http://www.des.state.nh.us/nhppp/mercurysur-vey.pdf, accessed 5 January, 2010).

Bamigboye, AbiodunP.,Adesanya, Abiodun T.(2006):" Knowledge and practice of Universal precaution among qualifying Medical and Nursing Students: Acase of

Obafemi Awolowo University Teaching Hospitals Complex, IL.E-IFE" Research journal of Medicine and Medical Sciences,1(3):112-116.

Banning, M. (2005). Transmission and epidemiology of MRSA, Current perspectives. British Journal of Nursing. 14(10). 548- 554.

Bolyard, EA. et al. (1998), Guidelines for infection control in health personnel, American journal of infection control, 1998, 26:289–354.

Boyce JM, Pittet D.(2002). Guideline for Hand Hygiene in Health-Care Settings. Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. Infect Control Hosp Epidemiol;23(12 Suppl):S3-40.

Burns, S. Grove, K. (1997), the practice of nursing research. W.B Saunders.

Sach, J. (2002), Weapon of mass salvation. The Economist, 20, 73-74.

Cannata, S. maibs, M. Bek, M. Baker, P. (1997). Infection control and decontamination of waste disposal practices in weastern Sydney area health services dental clinics. Aust,dent.32,199-202

CDR Wkly.(1997)Transmission of HIV from an infected surgeon to a patient.France. Commun Dis Rep; 7:17.

Center for Disease Control and Prevention (2001):"Guidelines for Hand Washing in Health Care Setting"

Center for Disease Control and Prevention (2003):"Guidelines for Environmental Infection Control in Health Care Facilities Recommendation of CDC and the Healthcare Infection Control Practices Advisory Committee.

Center for Disease Control and Prevention (2001): Updated U.S. Public Health Service Guidelines for Management of Occupational Exposure to HBV, HCV, and Recommendation for Post exposure Prophylaxis", Morbidity and Mortality Weekly Report 50 (11).

Crispian S. David M,Janice, F (2007):"Infection control:A survey of UK Special Care Dentist and Dental Care Professionals"Primary dental care 14 (4)pp: (40-46)

Declaration of Alma-Ata,(1978). International Conference on Primary Health Care , Alma-Ata, 6-12 September, USSR.

Duggan J Hensley S Papadimos T., Jacobs L. (2008):"Inverse correlation Between level of Proffesional Education and rate of Hand washing Compliance in a teaching Hospital "Chicago Journal Infection Control and Hospital Epidemiology, 29(6):534-538

Elkarim, IA. Abdulla, ZA. Yahia, NA. Al Qudah, A. Ibrahim, YE(2006), Basic infection control procedures in dental practice in Khartoum. Sudan. School of Dentistry, Queen's University.

Garn, RJ. Sellen, PN. Health and safety in the laboratory. Dent Tech (1992); 45(1):103.

Gershon, RR. Et al (1995).'' Compliance with universal precautions among healthcare workers at three regional hospitals''. American journal of infection control, 23:225–36.Gershon,R. robyn, T.M.MHS,DrPH; .

Karkashan,Christine,DMA;Vlaho(1999), Compliance with Universal Precaution in Correctional Health Facilities.

Gillian, M. BDS et al (1999).''Compliance with recommended infection control procedures among Canadian dentists'' Results of a national survey American Journal of Infection Control. 27(5):377-384, October 1999.

Grimshaw, J. and Russel, I (1993), Effect of clinical guidelines on medical practice: a systematic review of rigorous evaluation. Lancet, 342, 1317-22.

Gilloran, A. (1995),'' Gender differences in care delivery and supervisory relationships'': the case of psycho geriatric nursing. Journal of Advanced Nursing 21: 652-8.

Gordon, BL. et al, (2001). "Systematic review of adherence to infection control guidelines

in dentistry". J Dent; 29(8):509–16.

Gould, D. et al, (1997).'' Noncompliance with universal precautions and the associated risk of mucocutaneous blood exposure among Danish physicians''. Infection control and hospital epidemiology, 18:692–8.

Hadeson,R. Davis, SC. Jone, JH. and Sarell, Dw. (1995), Cross infection control in general dental practice, Dentist behavior compared with their knowledge and opinions. British Journal 178:365-9

Harris, AD. Samore, MH. Nafziger, R. Dirosario, K. Roghmann, Carmeli, Y. (2000); A survey on hand washing practice and openions of healthcare workers. J Hosp infect 45:318-321.

Hamdan, 2010 مقالة عن الاسلام و دوره فى مكافحة العدوى

HassanA, Moftah F, Alaa E-Din S, Bayomi S (2004)"Assessment of an educational training program for nurses working in maternity and child health (MCH) center in Assiut regarding infection control", Assiut University Bull. Enviorn. Res., 7(2):pp(91-105).

Hellgren, K. (1994), Use of gloves amongst dentists in Sweden - a 3-year follow-up study Swedish Dental Journal 18(1-2): 9-14.

Hesse A, Adu-Aryee N, Entsua-Mensah K, Wu L. (2006):"Knowledge, Attitude and Practice Universal Basic Precaution by Medical Personal in a teaching Hospital"Ghana Me ., 40(2): (61-64).

Henderson, CW. Schwartz, RS. Herbold, ET. Mayhew, RB. (1987) Evaluation of the barrier system: an infection control system for the dental laboratory. J Prosthet Dent 58: 517–21

Heudorf, E. etal, (2005) nurses' knowledge of and compliance with universal precautions in an acute care hospital. International journal of nursing studies., (39)(157–

163). IPSE. Annual report 2006.

Jagger, DC. Huggett, R. Harrison, A. (1995) Cross-infection in dental laboratories. Br Dent J.179:93–6.

Kamps, G. Stewart, R Werf, G. Schuling, J. and Megboon-delong, B. (2000). Adherence to the guidelines of a regional formulary. Family Practice Journal, 17, 3, 254-260.

Karkashian, CD, (2000), Knowledge and practices of health care workers and medical students towards universal precautions in hospitals in Mazandaran Province

Kearns HP, Burke FJ, Cheung SW. (2001,) Cross-infection control in dental practice in the Republic of Ireland. International dental journal, 51(1):17–22.

Kim, R. Oh P.& Simor, A. (2001), The economic impact of mythically resistant Staphylococcus aurous in Canadian Hospitals. Infection Control and Hospital Epidemiology 22(2), 99–105.

Kohn, WG Collins, AS. Cleveland, GL. Harte, GA.(2003), Guidelines of infection control in dental health care settings.National Center for chronic disease prevention and health promotion(CDC).

Kretzer, EK. Larson, EL. (1998), Behavioral interventions to improve infection control practices. Am J Infection Control;26:245-253

Kugel, G. Perry, RD. Ferrar, M. Lalicata, P. (2000) Disinfection and communication practices: a survey of U.S. dental laboratories. J Am Dent Assoc; 131(6):786 92.

Larson, E. Kreutzer, EK. (1995) Compliance with hand washing and barrier Precautions. *J Hosp Infect*; 30(Suppl):88-106.

Lomas, J. (1991), words without action? The production, dissemination and impact of consensus recommendations. Annual Revision for Public Health, 12, 41-65.

McCarthy, GM. MacDonald, JK. (1997), the infection control practices of general dental

practitioners. Infect Control Hosp. Epidemiology;18:699–703

McCarthy, GM. MacDonald, JK. (1994-1995), Improved compliance with recommended infection control practices in the dental office Am J Infect Control 1998; 26(1): 24-8.

MacDonald A, Dinah F, MacKenzie D, Wilson A. (2004) Performance feedback of hand hygiene using alcohol gel as the skin decontaminant, reduces the number of inpatient newly affected by MRSA and antibiotic costs. J Hosp Infect;56(1): 56- 63.

Motamed, F. BabaMahmoodi, A. Khalilian, M. Peykanheirati, M.(2005) Knowledge and practices of health care workers and medical students towards universal precautions in hospitals in Mazandaran Province

Miller, CH. Palenik, CJ. (1998) Infection control and management of hazardous materials for the dental team. 2nd ed. St. Louis: Mosby,

Ministry of health. (2004), Infection Prevention and Control Protocol 2004, Palestine National Authority: Palestinian health information center.

Ministry of health. (2005), Health Status in Palestine, Ministry of health annual report 2005. Palestinian national authority: Palestinian health information center.

Ministry of health (2007): http://www. Moh.gov.ps/shifa/index.htm (accessed on may 2010)

Morris E, Hassan FS, Al Nafisi A, Sugathan TN. (1996), Infection control knowledge and practices. Kuwait

Muawia, A. Qudeimat, BD. (2006), Infection control, knowledge and practice among dentist and dental nurses. A Jordanian university teaching center.

Mullin, L. (1999), Management and understanding organizational behavior. Financial Times Pitman Publishing

Omolara, G. Gbemisola, A. Agbelusi, S. Olukayode, J. Eyitope, O. (2008). Infection control knowledge and practices related to HIV among Nigerian dentists.

Onion, C. Bartzokas, C. (1998), Changing attitude to infection management in primary care: a controlled trial of active versus passive guidelines implementation strategies. Family Practical Journal, 15, 99-104.

Palestinian Central bureau of statistic, PCBS (2009) Statistical Abstract of Palestine book (9) Palestine

Palestinian Central Bureau of Statistics, (2006): "Demographic and Health Survey". Ramallah, Palestine. Palestinian Central Bureau of Statistics & World Bank (2004): Deep Palestinian.

Palestinian Non-Governmental Organizations, (2009): Priorities and Needs of Health Sector in Gaza Governorates: Consequences of the Long Siege and the last War on Gaza, Feb 2009, Gaza, Palestine Poverty in the Mideast of Economic Crisis. Ramallah, Palestine.

Pittet D, Hugonnet S, Harbarth S, Mourouga P, Sauvan V, Touveneau S, et al.(2002) Effectiveness of a hospital-wide programme toimprove compliance with hand hygiene. Infection Control Programme. Lancet, 356:1307-12

Queidmat, MA. Farrah, RY. Owais, AI. (2006). Infection control knowledge and practice among dentist and dental nurses at Jordanian university teaching center.

Ronnie, M. Elaine, Larson. Bin, C. Aaron, S. Keith, D. Silva and Carol (2008), Hand Hygiene Among General Practice Dentists.

Samaranayake P. Re-emergence of tuberculosis and its variants: implications for dentistry. International dental journal, 2002, 52(5):330–6.

Silva C. Barbe K., Touveneu S., Pernger T., Pittet D. (2005):" Attitude and perception toward hand hygiene among care workers caring for critically neonates ", Infection control and hospital epidemiology"26(3):305-311

Shama M., Fareed N, El-Bourgy D., Mahfouz A (2007), "Application of the Health belief

Model in Studying Noncompliance with Universal Precaution Among Nurses and laboratory Technician in Alexandria, Egypt "High Institute of Public Health, University of Alexandria, Egypt.

Soheir, W. Manal, F. Amal, S. Ghada E. (2006), Infection Control Practices in Dental Clinics, Egypt.

Sofou A, Larser T, Fiehn NE, Owell B. Contamination level of alginate impressions arriving at a dental laboratory. Clin Oral Investig 2002; 6:161–5

Sofola O, Savage K, study. Infection control and hospital epidemiology : the official journal of the Society of Hospital Epidemiologists of America 2003;24(10): 737- 40.

South Staffordshire IPC protocol, 2009

Syed, A. Hussain, B. Shamta, S. Ayyaz, A. (2009) Infection Control Practices Among Dental Practitioners of Lahore, Pakistan.

The Red Book Medical and Dental Council of Nigeria Guidelines on Minimum standards of Medical and Dental Education In Nigeria Revised Edition June, 2006 Revised Edition June, 2006

Tietjen L, (2003). Infection prevention guidelines for health care facilities with limited resources. JHPIEGO.

UNRWA annual report, 2008

UNRWA biweekly report, 2010.

USA, Federal Register,(2000), Office of Inspector General (OIG) Compliance Program for Individual and small Group Physician Practice. Department of Health and Human Services Report, 65, 194, 59434- 59452.

Voss, A. Widmer AF. (1997), No time for hand washing!? Hand washing versus alcoholic rub: can we afford 100% compliance? *Infect Control Hosp Epidemiol*;

18:205-208.

Walt,G. and Vaughan, P. (1982), Primary Health Care. What does it mean? Tropical Doctor, 112(3) 99-100.

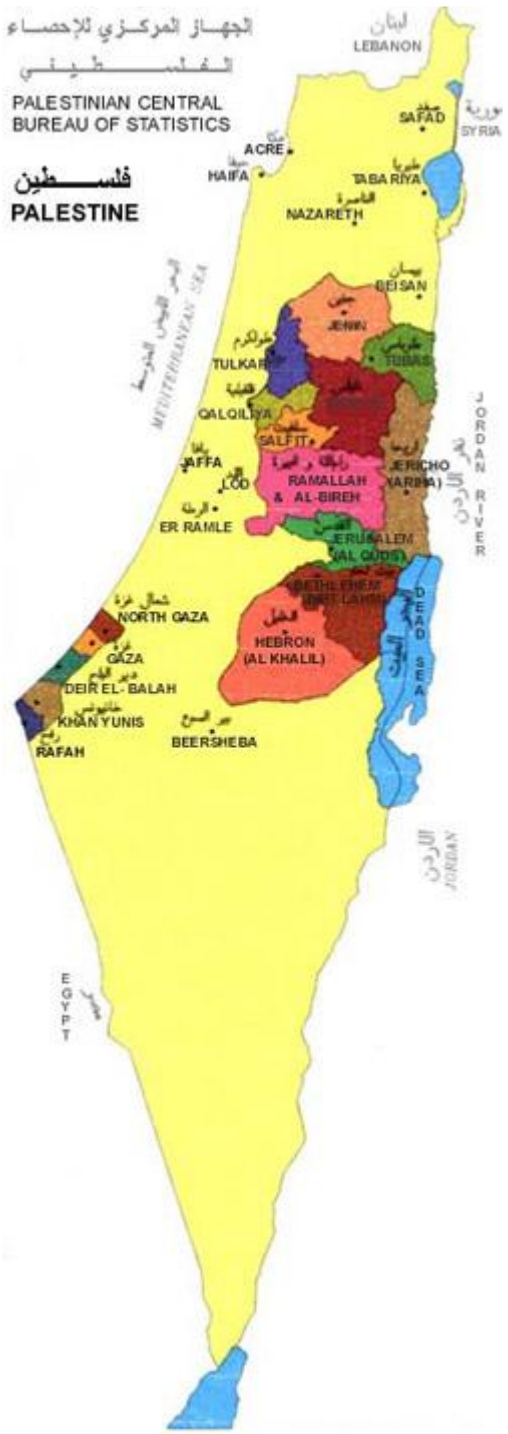
Williams CO, Campbell S, Henry K, Collier P. (1994) Variables influencing worker Compliance with universal precautions in the emergency department. *Am J Infect Control*; **22:** 138 – 148.

World Health Organization: Interim. Guidelines (2007) infection prevention and control of epidemic and pandemic prone acute respiratory diseases in health care.

Ziad Al-Dwairi. (2005) Compliance with infection control programs in private dental clinics in Jordan. Journal of Dental Education 693; June.

Annexes

Annex 1
Map of Palestine (PCBS, 2007)



Annex2
Map of Gaza (PCBS, 2007)

Annex 3

Dental Health Providers Questionnaire
Compliance with IPC protocol

1.	Questionnaire code: ☐☐☐	2.	*Facility /Center's Name*…….
3.	District…… ☐☐	4.	*Facility /Center's telephone*…….

Section A. Characteristics questions

5.	Age:----------years	6. Profession:	1. Dentist 2. Nurse 3. Oral hygienist 4. Other: …….	7. Highest degree awarded: 1. Master 2.Bachelor 3. Diploma 4. Other: …
8.	Place of graduation:……..	9.	Type of employment:	1. Regular 2. Job creation
10.	Gender a. male b. female	11.	Marital status:	1. Married 2. single 3. divorced 4. widowed
12.	Did you work in other organizations before? a. yes b. no			
13.	Total years of experience in dentistry: ----------		1. In the UNRWA …….....	
			2. Outside UNRWA……...	
14.	Have you been involved in the preparation of any infection control protocol? a. yes b. no			
15.	Did you receive any training courses on the IPC protocol practices? a. yes b. no if yes indicate the date of the last training course------/--------/---------			
16.	Is this training part of the in-service training in your facility? a. yes b. no c. don't know			
17.	Are you interested in a training course on the IPC protocol practices? a. yes b. no c. don't know			
18.	Does your basic education curriculum incorporate training about IPC? a. yes b. no			
19.	Do you have a written copy of the infection control protocol in your facility? a. yes (seen) 1- in English 2- in Arabic b. yes (not seen) c. no d. don't know			
20.	Availability of the protocols……(check) a. Present in the shelf of the room where services are provided b. Present in the drawer c. Present in the cupboard d. Present in other places (specify)----------			

	e. don't know
21.	Do you have a dental supervisor who supervises your work? a. yes b. no c. DK
22.	Do you supervise other employee in your center? a. Yes b. no
23.	Do you have in use monitoring system about infection rate in your facility a. Yes b. occasionally c. no d.DK
24.	Are the findings of monitoring used to improve infection control practice? a. Yes always b. Sometimes b. no c. don't know
25.	Has your facility ever carried out a follow up/supervision of your practice regarding the infection prevention implementation? a. yes every ----------month b. no c. don't know if yes mention the date of last follow up ----/-----/---
26.	If yes what are the tools does your organization usually use? a. Checklist b. Observation c. Questionnaire d. Monitoring of infection rate at the facility e. reports e. Others specify---------- f. None
27.	Did you receive any feedback after your supervisor's visit regarding your IPC practices in the clinic? a. yes written feedback b. yes verbal feedback c. not at all
28.	If yes, what you do with the feedback? a. keep it in the files without discussion b. discuses it with the concerned people c. use it in developing improvement strategies d. others, specify……..

29.	***Materials availability (refer to the last year)***						
SN	Material	Availability status A always b sometimes c rarely	Experiencing shortage 1.frequently 2. sometime 3. Never	SN	material	Availability status A always b. sometimes c. rarely	Experiencing shortage 1.frequently 2. sometimes 3.never
1	Sterile gloves			9	Garbage cans		
2	Alcohol with glycerin			10	Steam autoclave		
3	Mouth mask			11	Dry autoclave		
4	Bleach			12	Plastic paper to wrap instrument		
5	Plastic bags			13	Lab coats		
6	Towel papers for beds			14	Face mask		
7	Suction tubes			15	Aprons		

8	Employee vaccination(HepatitisB)			16	Cabinet for storage		

30.	In your opinion what are the reasons for material shortage you have experienced? a. Inadequate material in the central store b. Management problems in ordering the material c. Inaccurate estimation of the needed materials d. Miss-use e. Increased load e. Bureaucracy f. All of them g .Others specify…….
31.	What does IPC protocol mean to you? ***Tick what is applicable-more than one option is possible.*** a. IPC protocol improve quality of health b. Save health workers c. Save client lives d. Save the community e. Don't know

32.

Do you agree with the following statements?

Statement action	yes	No	DN
IPC Practices are essential for dental health care provider			
IPC practices decrease the creditability at work			
Decontamination solution should be changed every other day.			
Sterilization doesn't kill all microorganisms including bacterial endospores.			
Waste containers can be used for other purposes if they are washed with 0.5% chlorine solution.			
Wrap instrument as tightly as possible before autoclaving			
The time for autoclaving unwrapped instruments is 20 minutes.			
If gloves are in short supply it is acceptable not to change gloves between clients.			
Glass container that contains toxic substances can be washed and rinsed and reused.			

33.	Are you familiar with the concept of IPC standard precaution? a. yes b. no

34.	In your opinion what does standard precaution means to you? ***Tick what is applicable*** a. Represents a system of barrier precautions to be used by all personnel. b. They are the standards of care .c. They assume that all clients and all body fluids are contaminated all the time d.all of them e. don't know.
35.	What are the main components of standard precautions ***match all applicable answers***? a. Hand washing b. Glove use c. Other physical barriers (attire, includes chemical processes) d. Prevention of injuries from sharps e. Environmental cleanliness and waste-disposal f. Instrument processing (decontamination, cleaning, high-level disinfection, sterilization g. All of them
Section B: Practices	
36.	How does the IPC protocol influence your practices at the clinic? a. improve practice to high extent b. Improve practice to some extent c. doesn't improve practice at all
37.	Do you usually assess the client medical history regarding IPC before caring for them? a. regularly b. sometimes c. rarely c. not at all
38.	Do you document each client condition regarding infection or infectious diseases in the client file regardless to the number of visits he paid? a. yes b. no
39.	Is the IPC protocol in use at the facility you work at? a. always b. sometimes c. never (*if answer is c go to question 43*) If the answer in the above question is never, then please indicate the reasons for not using the protocol a.---------- b.---------- c.----------
40.	If used, are they user-friendly? a. yes to high extent b. yes to some extent c. not at all
41.	Have you noticed any problem in using of the IPC protocol? a. yes many b. yes few c. not at all
42.	What are the main problems in using the IPC protocol? ***match all applicable answers***? a. Insufficient knowledge b. Insufficient training c. Poor follow up from the facility d. Work overload e. Lack of time f. Others (please specify):……
43.	Do you have a private clinic? a. yes b. no

44.	Do you practice the IPC protocol practices in your private clinic? d. if the answer is c mention the reasons a. yes always b. some times c. never …….
45.	What is your opinion about DHCP compliance with the IPC protocol? a. excellent b. very good c. good d. bad
46.	Does your professional position give you the possibility of contributing in the updating of the IPC protocol? a. yes b. no c. don't know
Section C: Your comments	
47.	In your opinion what are the most important action needed to increase the Dentist compliance with the IPC protocol _____ _____ _____ _____ _____

Thank you for your cooperation.

Annex 4

Checklist of IPC practices

Clinic name ……. Date…… Code number (number of questionnaire) ……..
Observation NO……..Observation code ……

Serial	The following items represent standard practices	Observation		
1.	Hands washed between each client	Y	N	NA
2.	Hands are dried with a clean towel	Y	N	NA
3.	Gloves are worn when indicated.	Y	N	NA
4.	Utility gloves are worn when handling contaminated instruments,	Y	N	NA
5.	Gloves are removed in the proper way	Y	N	NA
6.	Lab coats are worn	Y	N	NA
7.	Dental unit is cleaned with disinfectant solution (0.5% sodium hypochlorite).	Y	N	NA
8.	All surfaces of the instruments are cleaned before further processing	Y	N	NA
9.	Instruments are processed in the way it should be	Y	N	NA
10.	Mask is worn when caring for the clients	Y	N	NA
11.	Sharp materials are put in the sharp boxes	Y	N	NA
12.	The waste materials are put in a special bags with different colors according to the type of waste	Y	N	NA
13.	The forceps for extraction is used for one client and then decontaminated	Y	N	NA
14.	There are amalgam carrier available for each client	Y	N	NA
15.	A face mask is worn every time you check your patients	Y	N	NA
16.	The turbine is cleaned between clients.	Y	N	NA
17.	The mirror which is used for dental examination is changed between clients	Y	N	NA

Annex 5

Infection Prevention and Control
Systems and Supplies Checklist

Health Facility Name:……Date of observation……
Facility address ----------

SN	The following items represent standard practices of IPC according to protocols/ guidelines	Observation		
1	Paper sheets are available on all examination couches	Y	N	NA
2	Water source are available	Y	N	NA
3	A sink, is available	Y	N	NA
4	Soap bars or liquid soap, are available.	Y	N	NA
5	Towels or tissue paper are available	Y	N	NA
6	Plastic basins for decontamination are available.	Y	N	NA
7	0.5% chlorine solution is available.	Y	N	NA
8	Cleaning brushes are available for proper instrument cleaning.	Y	N	NA
9	Utility gloves are available for proper decontamination and cleaning .	Y	N	NA
10	The steam autoclave is functioning well	Y	N	NA
11	Indicator tape is available.	**Y**	**N**	NA
12	There are sharp boxes in every room or area where sharps are used.	**Y**	**N**	NA
13	Hazardous wastes are managed separately from the other wastes	**Y**	**N**	NA
14	Toilets are available in proportion to beneficiaries	**Y**	**N**	NA
15	Toilet are clean	**Y**	**N**	NA
16	IPC job aid charts are available	**Y**	**N**	NA

Palestinian National Authority
Ministry of Health
Helsinki Committee

السلطة الوطنية الفلسطينية
وزارة الصحة
لجنة هلسنكي

Annex 6

التاريخ2009/6/3

Name:

الاسم: تمام محمد عبد الرحمن أبو زيد

I would like to inform you that the committee has discussed your application about:

نفيدكم علماً بأن اللجنة قد ناقشت مقترح دراستكم حول:-

Compliance with the National Infection Prevention and control protocol in UNRWA Dental Unit

In its meeting on June 2009

و ذلك في جلستها المنعقدة لشهر 6 2009

and decided the Following:-

و قد قررت ما يلي:-

To approve the above mention research study.

الموافقة على البحث المذكور عاليه.

Signature
توقيع

Member
عضو

Member
عضو

Chairperson
Ministry of Health Committee

Conditions:-

- Valid for 2 years from the date of approval to start.
- It is necessary to notify the committee in any change in the admitted study protocol.
- The committee appreciate receiving one copy of your final research when it is completed.

Annex 7

Al-Quds University

Jerusalem

School of Public Health

جامعة القدس

القدس

كلية الصحة العامة

13/9/2009

الأخ/د. محمد المقادمة المحترم

مدير دائرة الصحة–وكالة الغوث

تحية طيبة وبعد،،،

الموضوع: مساعدة الطالبة تمام أبو زيد

تقوم الطالبة المذكورة بأعلاه بإجراء بحث بعنوان :

"Compliance with the national Infection Prevention and Control protocol in UNRWA Dental Units in Gaza Governorates

كمتطلب للحصول على درجة الماجستير في الصحة العامة–مسار إدارة صحية و عليه نرجو التكرم للإيعاز لمن ترونه مناسب لتسهيل مهمة الطالبة في جمع البيانات اللازمة من عيادات الرعاية الأولية التابعة لإدارتكم المرقرة .

علماً بأن المعلومات ستكون متوفرة لدى الباحثة و الجامعة فقط.

و اقبلوا فائق التحية و الاحترام،،،

د. بسام أبو حمد

منسق عام برامج الصحة العامة

نسخة:

- الملف

Jerusalem Branch/Telefax 02-24799234 Sphealth@admin.alquds.edu فرع القدس/تلفاكس 02-2799234

Gaza Branch/telefax 08-2884422-2884411 فرع غزة/تلفاكس 08-2884422-2884411

ص.ب/51000–القدس

Al Quds University جا معة القدس
School of Public Health كلية الصحة العامة
فلسطين _القدس

Annex 8

Informed consent

Research title: compliance to national Palestinian infection and control protocol in dental units.

Hello, my name is Tamam Abu Zaid; I am master student of public health at Al Quds University-Palestine.

I am conducting my research as a part of my study requirement at the university.

The study aims to evaluate dentist's compliance with the Palestinian infection and prevention control protocol.

. The study will help illustrating tools for improvement thus could lead to more compliance, less complications, and better outcomes.

I highly appreciate your participation in this study. The questionnaire takes 10 to 15 minutes, if you feel tired or uncomfortable please ask to hold the interview. Participation in this study is voluntary and you have the right to withdraw at any time. Confidentiality will be provided, no need to write down your name Please answer the questions you as feel, and practice in reality.

Thank you very much in advance for your co-operation.

Annex 9

أحاديث نبوية

1. : ((أغلقوا الباب، وأوكوا السقاء، وأكفئوا - أو خمروا - الإناء، وأطفئوا المصباح؛ فإنَّ الشَّيطان لا يفتح غلقًا، ولا يحل وكاء، ولا يكشف إناء، وإن الفويسقة تضرم على النَّاس بيتهم))
2. ((إذا ولغ الكلب في إناء أحدكم فليغسله سبع مرَّات إحداهنَّ بالتُّراب))
3. فِعْل الفاروق عمر - رضي الله عنه - وقوله - وهو من كبار فُقهاء الصَّحابة - فقد رفض السَّفر إلى الشَّام حين ظهر بها مرض الطَّاعون؛ ولمَّا قيل له: أتفر من قدر الله يا عمر؟ قال : نفر من قدر الله إلى قدر الله.
4. -: (النظافة شطر الإيمان) و: (النظافة من الإيمان)

-: (إذا سمعتم بالوباء بأرض فلا تقدموا إليه، فإذا وقع بأرض وأنتم فيها فلا تخرجوا فراراً منه

(اجعل بينك وبين المجذوم قدر رمح أو رمحين)..

(لا يورد ممرض على مصح)

ملخص الدراسة

تحاول هذه الدراسة أن تبين مدى امتثال مقدمي الخدمة في عيادات الأسنان بمعايير منع و مكافحة العدوى في عيادات الأسنان التابعة لوكالة الغوث الدولية في محافظات غزة.

إعداد: تمام محمد أبو زيد

إشراف: د. بسام أبو حمد

أهداف الدراسة:

من خلال جهود وطنية، تم تطوير بروتوكول فلسطيني عن منع و مكافحة العدوى ملائم للوضع الصحي الفلسطيني. بالرغم من وجود مراقبة داخلية في المراكز الصحية التابعة لوكالة الغوث الدولية ، إلا انه و منذ ذلك الحين لم يتم أي تقييم لاستخدام هذا البروتوكول ،كما لا يوجد أي دراسة علمية قد أجريت لتقييم مدى امتثال مقدمي الرعاية الصحية في عيادات الأسنان لهذا البروتوكول. هذه الدراسة تهدف لتقييم مدى امتثال مقدمي الخدمة مع الممارسات الخاصة بهذا البروتوكول في المراكز الصحية التابعة لوكالة الغوث الدولية في محافظات غزة و تقييم مدى المعرفة والتوجهات والممارسات لمقدمي الخدمة في عيادات الأسنان. و هذه الدراسة سوف تساهم في استنباط و توضيح العوامل التي تؤثر على التزام مقدمي الخدمة لهذا البروتوكول و سوف تساهم في الحد من انتشار العدوى من شخص لآخر مما يؤدى إلى الحد من نسبة الوفيات و الأمراض طالما أن انتقال العدوى و مضاعفاتها تعد سببا من العوامل المسببة للوفاة في العالم

منهجية الدراسة:

قد أجريت هذه الدراسة في جميع المراكز الصحية التابعة لوكالة الغوث الدولية في محافظات غزة. إن هذه دراسة وصفية، تحليلية، والتي استخدم الباحث أكثر من طريقة لجمع البيانات وذلك لزيادة مصداقية الدراسة. وشملت العينة جميع مزودي الرعاية الصحية في عيادات الأسنان و الذين يعملون في المراكز الصحية التابعة لوكالة الغوث الدولية في محافظات غزة و كان عددهم ثمانون (80) مساهم والذين قاموا بتعبئة

الاستبيان عن طريق المقابلة و كان معدل الاستجابة 100%. ولوحظوا من قبل الباحث أثناء عملهم.كما تم تحضير قائمة بالموارد والأدوات اللازمة لتقييم مدى ملائمة وحدات طب الأسنان لمعايير مكافحة العدوى.

نتائج الدراسة:

أظهرت الدراسة أن 87% من المساهمين كانوا ذكورا و 21% كانوا إناثا. 50 ٪ منهم تلقوا التدريب بشأن ممارسات مكافحة العدوى. كما كان 43 ٪ لديهم بروتوكول. أوضحت الدراسة أن الأدوات اللازمة لممارسة منع انتشار العدوى موجودة بصورة مستمرة عدا عن بعض الأدوات الضرورية جدا مثل القفازات المنزلية وقناع الوجه. من خلال مراقبة المشاركين أثناء عملهم، أظهرت الدراسة أن 35 ٪ فقط قاموا بغسل غسل أيديهم بينما 33 ٪ غيروا القفازات بين المرضى، وارتداء قناع الفم 80 ٪ ،أما 26.3 ٪ قاموا بتطهير أسطح سرر الأسنان بمحلول معقم و 56% على دراية بالمعايير الوقائية و قاموا بتعريفها. وقد كشفت الدراسة أنه لا توجد فروق ذات دلالة إحصائية بين ممارسات مكافحة العدوى والمتغيرات الاجتماعية و الديموغرافية . كما أوضحت الدراسة وجود فروق ذات دلالة إحصائية بين ممارسات مكافحة العدوى و اشتمال المنهج الدراسي على تدريب على منع انتشار العدوى وخلصت الدراسة إلى أن هناك قلة التزام من مقدمي الرعاية الصحية في عيادات الأسنان.

التوصيات

قدمت الباحثة بعض التوصيات مثل التدريب في الخدمة، ومشاركة مقدمي الخدمة في تطوير البروتوكول، وتعزيز الرصد والتقييم و المتابعة، و مناقشة مشاكل البروتوكول مع مقدمي الخدمة.