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Adherence to Infection Prevention and Control Protocols in the Neonatal Intensive Care Units in the Governmental Hospitals in Gaza Governorates

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Declaration

I certify that all 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.

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Abstract

Newborns in intensive care units are more susceptible for infection; most deaths in the late neonatal period are due to infections. This study aimed to assess the adherence to infection prevention and control protocols in the neonatal intensive care units in the Ministry of Health hospitals in Gaza governorates.

This study is descriptive analytical cross-sectional conducted on neonatal intensive care unites, study sample consist of 128 subject physicians and nurses working in the NICUs. Data were collected by three instruments; self administered structure questionnaires, assessment structured checklist of physical environment in the NICU and structured observation checklist, with response rate was 92%.

The findings revealed that 54% of respondents were male, and 32% were physicians, 68% were nurses, most of respondents did not have a copy of IPC protocol, and most of them (73%) did not know about the existence of the Palestinian infection prevention and control protocol, and not have know the contents of the prtocol. Seventy three percent of health care workers have knowledge about the standard precautions; most of health care workers received hepatitis B vaccination; while 78% of HCWs were exposed to sharp instruments injuries.

The study also revealed that hospitals don't provide training to the health care workers, and lack of continuous update information and instructions about infection prevention and control. The majority of health care workers reported not have system of performance feedback about infection prevention and control, also revealed shortage of availability of appropriate physical environment regarding the infection prevention and control in NICUs.

The study clarifies that the practices of infection prevention and control was 56%; while the attitudes is high. The reasons of non adherence to infection prevention and control according to the health care workers perception were the absence of a training program and lack of knowledge and education.

The study showed that there statistically significant differences between practices and the hospitals, and no statistically significant differences between practices and year's

of experience, type of profession, and gender in relation to infection prevention and control. No statistically significant relationship between attitudes and year's of experience, type of profession, hospitals and gender were found.

The researcher recommend to create a national Infection Prevention and Control Program, comprehensive program of regular training, and training as part of on-the-job, to include all HCWs , and as part of orientation program in the NICUs. To conduct specific policies and measure, provide and maintain adequate supplies, resources, and equipment.

ملخص الدراسة

الأطفال حديثي الولادة بأقسام العناية المركزة عرضة للعدوى وذلك لعدة أسباب منها عدم اكتمال جهاز المناعة لديهم، الاتصال المباشر بالطاقم الطبي، أجهزة التنفس الصناعي، فترة المكوث الطويل ة في المستشفي. تعد العدوى من الأسباب الرئيسة لوفيات حديثي الولادة و سبب مهم من أسباب الممراضة والوفيات في الرضع، هدف الدراسة هو تقييم مدي التزام ببرتوكولات منع ومكافحة العدوى بأقسام العناية المركزة للأطفا ل حديثي الولادة بمستشفيات وزارة الصحة بمحافظات غزة .

الأهداف الفرعية للدراسة :

1. وصف الإجراءات والممارسات المطبقة في وحدات العناية المركزة لحديثي الولادة لمنع ومكافحة العدوى
2. تقييم الالتزام ببووتوكولات منع ومكافحة العدوى في وحدات العناية المركزة لحديثي الولادة
3. تقييم المعارف و التوجهات والممارسات من العاملين الصحيين في وحدات العناية المركزة لحديثي الولادة تجاه منع ومكافحة العدوى.
4. تحديد معوقات الامتثال لبروتوكولات منع ومكافحة العدوى في وحدات العناية المركزة لحديثي الولادة.
5. تقييم الظروف البيئية بوحدات العناية المركزة لحديثي الولادة في ما يتعلق بمنع ومكافحة العدوى.
6. فحص العلاقة بين ممارسات و توجهات العاملين الصحيين لمنع ومكافحة العدوى في وحدات العناية المركزة لحديثي الولادة وبعض الخصائص الديموغرافية:الجنس ، الخبرة ، ونوع المهنة ، والمستشفى بشأن منع ومكافحة العدوى .

منهجية و عينة الدراسة :-

هذه الدراسة وصفية تحليلية مقطعية, تكونت عينة الدراسة من جميع التمريض والأطباء الذين يعملون في وحدات العناية المركزة لحديثي الولادة في مستشفيات وزارة الصحة في محافظات غزة. وعددهم 128 من المستشفات التالية: مستشفي الشفاء ، مستشفى النصر للأطفال ، مستشفى خان يونس ، مستشفى غزة الأوروبي ، مستشفي شهداء الاقصي .

جمع المعلومات:

تم جمع المعلومات بالطريقتين النوعية والكمية واستخدمت ثلاث أدوات تم تصميمها من قبل الباحثة في ضوء البرتوكول الفلسطيني لمكافحة العدوى و" المعايير الموص ي بها من قبل الأكاديمية الأمريكية لطب الأطفال والكلية الأمريكية لأطباء التوليد، وهي: استبيان، استمارة تقييم الظروف البيئية فيما يخص منع مكافحة العدوى و استمارة ملاحظة ممارسات العاملين. وقد تم فحص صدق وثبات الأدوات البحثية من الناحية العلمية ومن قبل محكمين بالإضافة لتطبيق الاستبانة علي عينة استطلاعية قبل بدء البحث .

النتائج:

بينت نتائج الدراسة أن معدل الاستجابة 92%، 54% الذكور و 46% إناث، نسبة الأطباء32%, 68%منهم كان من التمريض ومعظم العاملين لديهم سنوات الخبرة اقل من 15عام.

كشفت الدراسة أن معظم العاملين لا يوجد لديهم نسخة من بروتوكول مكافحة العدوى (87%) وفقط 27% من العاملين لديهم معرفة بوجود بروتوكول فلسطيني ؛ فقط47% منهم يعرفون محتوياته ، بينما كانت نسبة الذين يعرفون عن الاحتياطات المعيارية (العالمية) 73% .

أظهرت الدراسة أن غالبية العاملين تلقوا تطعيم التهاب الكبد الوبائي ب85%، وان عدداً كبيراً من العاملين الصحيين تعرضوا لإصابات من أدوات حادة 78%,كما وكشفت الدراسة أن غالبية العاملين لم يتلقوا أي دورات تدريبية حول منع ومكافحة العدوى ونسبة واسعة أفادوا بان المستشفي لا تزودهم بمعلومات حديثة ، كما وأفادوا بعدم وجود نظام متابعة خاص بمنع ومكافحة العدوى, و الأغلبية العظمي من العاملين يرون بأنهم بحاجة لتعلم المزيد حول منع ومكافحة العدوى.

وكما أظهرت الدراسة أن معدل تطبيق وممارسة مكافحة العدوى كان منخفض 56%، ومقارنة بتوجهاتهم نحو منع ومكافحة العدوى التي كانت مرتفعة 89%.

كشفت الدراسة وجود نقص وعدم تطبيق في بعض المستلزمات والأدوات في وحدات العناية المركزة للأطفال حديثي الولادة وخاصة فيما يتعلق بالمواد الحادة والتعامل معها و النفايات والتخلص منه وأيضا كشفت عدم وجود أي نسخة من برتوكول منع ومكافحة العدوى بكل الوحدات , كما كان الأكثر تطبيقا لمكافحةالعدوي والالتزام ببرتوكول منع ومكافحة العدوي العناية المركزة للأطفال حديثي الولادة بمستشفي غزة الأوربي ,وأظهرت الدراسة

وجود اختلاف واضح ذا دلالة إحصائية بين المستشفيات وتطبيق مكافحة العدوى .وكان سبب عدم الالتزام من وجهة نظر العاملين عدم وجود برنامج تدريبي بالإضافة لنقص المعرفة .

أوصت الدراسة بوجوب توفير برنامج وطني يضم هذا البرنامج فريق ولجنة لمنع ومكافحة العدوى , ووجود برنامج تدريبي شامل لكل العاملين الصحيين حول منع ومكافحة العدوى , وتوفير الأدوات والمستلزمات الضرورية لتطبيق مكافحة العدوى بما فيها توفير نسخ من برتوكول منع و مكافحة العدوى, توفير تطعيم التهاب الكبد الوبائي" ب" لكل العاملين, وأخيرا أوصت الدراسة بوجوب وجود نظام رقابي لمتابعة تطبيق برتوكول منع ومكافحة العدوى، وتقترح الدراسة أجراء دراسات أخري حول غسل اليدين والتعامل مع النفايات ؛ للمساعدة في تقليل نسبة وفيات الرضع .

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Term Definition

Adherence: Adherence is also known as compliance

According to Cambridge Advanced Learner's Dictionary to continue to obey a rule or maintain a belief. Adherent (noun) a person who strongly supports a particular person, principle or set of ideas; or a person was noted for his strict adherence to the rules.

Or generally defined as the extent to which a person's behavior – taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider (International Council of Nurses, 2008).

Aseptic techniques: the measures that are intended to act as a barrier between infected or potentially contaminated tissue and the environment, including other patients and personnel (WHO, 2004).

Cleaning: The principal aim of cleaning is to remove visible dirt. It is essentially A mechanical process: the dirt is dissolved by water, diluted until it is no longer visible, and rinsed off (WHO, 2004).

Infection prevention and control (IPC):

Infection: defined as the transmission of microorganisms into a host after evading defense mechanisms, resulting in the organism's proliferation and invasion within host tissue (CDC, 2007).

Prevention: -According to Cambridge Advanced Learner's Dictionary- intended to stop something before it happens

Control:-According to Cambridge Advanced Learner's Dictionary-: to order, limit, instruct or rule something, or someone's actions or behavior.

Infection prevention and control (IPC): is various practices which, used appropriately, restrict the spread of infection. It is important health care workers, patients, and alls members, contacts to adhere to the infection (WHO, 2004).

Hand hygiene: A general term referring to any action of hand cleaning.

Hand washing. Washing hands with plain (i.e., non-antimicrobial) soap and water (CDC, 2002).

Antiseptic hand washing: washing hands with water and soap or other antiseptic agent detergents containing (WHO, 2007).

Health care worker (HCW): Any person working in a health care facility, for example, medical officer, nurse, physiotherapist, cleaner, psychologist (WHO, 2004),

Operational definition: any doctors or nurse who work in neonatal intensive care units

Nosocomial infection - hospital acquired- infections, hospital-associated infections, that are not present in the patient at the time of admission to hospital but develop during the course of the stay in hospital (WHO, 2007).

Sharps: Any sharp instrument that may cause injury. This includes scalpels, needles and lancets.

Standard precautions: Universal Precautions and Body Substance Isolation Standard Precautions include a group of infection prevention practices that apply to all patients, regardless of suspected or confirmed infection status, in any setting in which healthcare is delivered. These include: hand hygiene, use of gloves, gown, mask, eye protection, or face shield, depending on the anticipated exposure, and safe injection practices, equipment in the patient environment

Protocol: A rule, guideline, or document which guides how an activity should be performed.

List of abbreviations

CDC	Center for Disease Control and Prevention
CBR	Crud Birth Rate
CDR	Crud Death Rate
HCWs	Health Care Workers
HIV	Human Immunodeficiency Virus
HBV	Hepatitis B Virus
IMR	Infant mortality rate
IPC	Infection Prevention and Control.
ICU	Intensive Care Unit.
MOH	Ministry of Health.
NICU	Neonatal Intensive Care Unit.
PCBS	Palestinian Central Bureau of Statistics
WB	West Bank.
WHO	World Health Organization.

Chapter (1)

Introduction

1- Introduction

Newborns in intensive care units are more susceptible for infection related to several factors, including immature immune system, close contact with health team, long hospitalization, invasive procedure and ventilators (Couto, 2006). Infections are the main cause of neonatal death after the first week of life in many countries; most deaths in the late neonatal period are due to infections (Word health Organization (WHO), 2006). From four million neonatal deaths annually worldly, 2.8 million occur in the first week of life (the early neonatal period) and 1.2 million between 8 and 28 days of life (the late neonatal period), and most deaths in the late neonatal period are due to infections (WHO, 2005). Word Health Organization (WHO) estimated that about 26% of newborn infants death occurs because of infections around birth (WHO, 2006). Infection and sepsis are significant causes of mortality and long-term morbidity in neonate (Yalaz, 2006).

Infectious diseases are diseases that can be transmitted from person to another (Stephen et al, 2000). Infection is defined as "the transmission of microorganisms into a host after evading defense mechanisms, resulting in the organism's proliferation and invasion within host tissue"(Center for Disease Control and Prevention (CDC),2007). Host responses to infection may include clinical symptoms or may be sub clinical, 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 host tissues (CDC, 2007).

An infection prevention and control protocol is the activities aiming to prevent the spread of pathogens between patients from health care workers to patients and from

patients to health care workers in the health care setting (WHO, 2003). Infection control measures are based on how an infectious agent transmitted and include standard contact, droplet and airborne precaution (CDC, 2003). This definition guides us to know the infection control modules outlined below.

1.2 Infection prevention and control modules

Because of the importance of infection prevention and control, many international agencies developed modules or strategies for infection prevention and control. From these agencies was in the forefront Centers for Disease Control and Prevention (CDC). Palestinian infection prevention and control protocol then derived from the CDC guidelines to protect the health of workers, clients, and community and environment (Ministry of health, 2004). Infection control practices can be grouped in two categories: standard precautions and additional (transmission-based) precautions. Standard precautions: are to be used by all personnel who are in contact with blood, all body fluid, secretions, non-intact skin and mucus membrane of all patients regardless of their diagnosis, it considers every person, patient, or staff as potentially infectious and susceptible to infection. These include the following: hand washing and antisepsis (hand hygiene), use personal protective equipment when handling blood, body substances, excretions and secretions; appropriate handling of patient care equipment, prevention of needle stick/sharp injuries, environmental cleaning and management, and appropriate handling of waste (MOH,2004).

Additional precautions (transmission-based precautions): which are specific to modes of transmission, are taken while ensuring standard precautions are maintained,

additional precautions include: airborne precautions, droplet precautions, and contact precautions (WHO, 2004a).

1. 2.1 Palestine infection prevention and control protocol:

The Palestinian infection prevention and control developed to protect the health of workers, clients, community and environment, developed with technical and financial support from Maram Project (MOH, 2004),and is approved by Palestinian Ministry of Health (MOH); the protocol focuses on the following components: hand hygiene, wearing gloves, using physical barriers, using antiseptic agents, using safe work practices including safe handling of needles and sharp instruments, safely dispose infectious waste and prevent spread infection to the community, process instrument through cleaning, high level disinfecting and sterilization, and protect health workers through relevant immunization (MOH , 2004).

1.3 Problem Statement

As the foregoing infection is the main cause of late neonatal death in the neonatal period, infection and sepsis are significant causes of neonatal mortality and long term morbidity, and majority of neonatal deaths occur in developing countries. In Palestine in 2005, the death reported due to infectious disease was 10.3% of total deaths, with rate of 27.8/100,000 population. In year 2004 and 2005 an out break of septicemia in Al-Shifa hospital took place, the percent of septicemia was19.6% in 2004 and 21.6% in 2005 the average of mortality among those was about 29.7% in 2004 and 29% in 2005 (unpublished from NICU in Al Shifa hospital). Neonatal sepsis remains one of the leading causes of neonatal admission, morbidity, and mortality, and Klebsiella,

were the major cause of neonatal sepsis in Neonatal Intensive Care units (NICUs) in Gaza in 2005(Abu Elamreen**,** 2007).

The infection prevention and control are measures that can lower the probability of cross-infection among patients in (NICUs). Because of the lack of research about infection prevention and control in Gaza, the results of this study will contribute to improve the infection prevention and control (IPC) practices provided and decreased infection in the NICUs, and decrease burden of the infant mortality and morbidity.

1.4 Justification and Significance of the study:

According to Word Health Organization (WHO) infants' risk of dying highest in the first month of life, almost four million infant die within a month of their birth in the neonatal period. Preterm birth, birth asphyxia and infections are the causes of most infant deaths (WHO, 2006). Moreover, about 26% of newborn infants die as the result of infections that occurs around birth (WHO, 2006). Infection and sepsis are significant cause of mortality and long-term morbidity in neonate, because neonate is particularly more susceptible to infections especially premature and low birth weight that require long hospitalization, nutrition support, mechanical ventilation and antimicrobial therapy (Mehmet, 2006).

Neonatal septicemia is a major cause of morbidity and mortality in developing countries and the main cause of death. In low incomes countries is the infectious disease the percentage about 45% (Al-Zwaini1, 2002). About 10% of hospitalized patient develops nosocomial -hospital acquired- infection every year, the rate increased to 25% in developing countries.

In Palestine in 2005, the death reported due to infectious disease was 10.3% of total deaths, with rate of 27.8/100,000 population, the rate among infants was7.3%, and

6.0% from septicemia. The death reported due to infectious disease in children less than five years was of 6.6% (MOH, 2005).

In Palestine, there's limited information due to the lack of adequate research and studies. There is no any study -according to the researcher's knowledge- about the impact of infection on neonate or about infection prevention and control in NICU. Therefore, this is the first research in the Gaza Governorates, which highlights the infection prevention and control in the neonatal intensive care units aimed to reducing the infant mortality and morbidity in Gaza Governorates. Based on these reasons, in addition to the researcher's experience and observation in the last nine years in NICU, we in Gaza Governorates were needed such this study in the light of "Palestinian protocol of infection prevention and control". This study will assess the scope of the problem (infection in NICU) and put appropriate recommendation to control it, and it's needed to say that any protocol should by monitoring and evaluating after begin implemented to ensure that meet the objectives for which they were developed; this study considered as the first trial to evaluate the IPC protocol.

1.5 The purpose of the study

The main purpose of this study is to assess the adherence to infection prevention and control protocol in the neonatal intensive care units (NICUs) in ministry of health hospitals in Gaza governorates; in order to enhance practices and prevent cross infection among neonatal infant to help in decreasing the infant mortality and morbidity in Gaza governorates.

1.6 Objectives of the study

1.To describe the infection control procedures, practices and strategies applied in the neonatal intensive care units.

2. To assess the adherence to the infection prevention and control protocol in neonatal intensive care units

3. To examine knowledge, attitudes and practices of health workers in neonatal intensive care units toward infection prevention and control.

4. To identify the common obstacles facing the adherence to infection prevention and control protocols in neonatal intensive care units.

5. To assess the physical environment in the neonatal intensive care units in relation to infection prevention and control.

6. To assess the association between practices, and attitudes of health care workers in neonatal intensive care units and some demographic characteristics (gender, year's of experience, type of profession, and the hospital) about infection prevention and control .

1.7 Research questions:

This study addresses the following research questions:

1. What are the infection control procedures, practices and strategies implemented in the neonatal intensive care units?
2. What are the differences in approach between the infection prevention and control protocol applied in neonatal intensive care units and the Ministry of Health infection prevention and control protocol?
3. What is the status of knowledge, and attitudes of health care workers in neonatal intensive care units about infection prevention and control?

4. What are the common obstacles in implementation of infection prevention and control in neonatal intensive care units?
5. What's the eligibility of physical environment in the neonatal intensive care units in relation to infection prevention and control?
6. Is there an association between practices, and attitudes of health workers in neonatal intensive care units and some demographic characteristics (gender, year's of experience, type of profession, and the hospital) about infection prevention and control?

1.8 Country profile of the study:

The researcher provided some helpful background information about the country where the study was conducted at the Gaza governorates in Palestine; the researcher will review the geographical, demographical and health care system.

1.8.1 Geographical context of Gaza governorates:

Palestine is located in the western Asian continent along the line between 15-34, 40-35 east, 15-29 and 15-33 North (MOH, 2005). Palestine is bordered by Lebanon in north Syria and Jordan in the east, Egypt in the south Mediterranean Sea in the west (MOH, 2005). The area of Palestine is more than 27 thousand square kilometers (Annex 1) , and West Bank and Gaza Strip just part of this area, about 22%, equivalent to 6000 km 2, the West Bank, the largest part of this area, which is about 5635 km 2 while the area of the Gaza Strip is 365 km 2 (MOH, 2005).

Gaza governorates are a narrow costal strip of land lying along Mediterranean Sea. Its position on the crossroads from Africa to Asia, made it a target for occupiers and conquerors over the centuries; The last of these was Israel who occupied the Gaza

strip in 1967, till the Palestine authority came in1993, and theirs no Israeli settlements bases in Gaza governorates since 2005 (MOH,2005).

Gaza governorates that comprises of five governorates: north of Gaza constituted 17% of the total area of Gaza strip and with area 61sq km. Gaza city constituted 20.3% of the total areas of Gaza governorates with area 74 sq. Km, Mid Zone constituted about 15% of the total area of Gaza with area 58sq. Km, Khan-younis: constituted about 30.5% of the total area of Gaza strip with area 108 sq Km, Rafah: constituted about 16.2% of the total area of Gaza strip with area 64 sq. Km (Annex 2)(MOH,2005).

1.8.2 Demographic context

The population size of Palestine(West bank and Gaza governorates) estimated about 3,761,646 in 2007 ,and the population size of Gaza governorates estimated about 1,416,539 in 2007, and about 2,345,107 in West Bank (Palestinian Central Bureau of Statistics (PCBS), 2008).

According to Palestinian Center Bureau of Statistics (PCBS) Gaza governorates are very crowded place with area 365sq. Km and, the population density is 3, 8881 inhabitants/ km2, the population size in year of 2007 is 1,416,543 (PCBS, 2008), mainly concentrated in the cities, small villages, and eight refugee camps (MOH, 2005).

The total number of population living in Gaza City is 496,411 individual with population density 6708 (Person/km2) in 2007,the total number of population living in Mid-Zone is 205,535 individual with population density 3544 (Person/km2), the total number of population living in North of Gaza is 270,246 individual with population density 4,430 (Person/km2), the total number of population in Khan-

younis is 270,979 individuals with population density is 2,509 individuals, the total number of population in Rafah is 173,372 individuals in 2007 (PCBS, 2008).

Demographical indicators in Gaza Governorates:

The average live expectancy for Gaza Governorates population in year 2007 was 71.7 year for male and 73.2 year for female, the majority of population is young where the percentage of those less than 15 years old is 44.1% and only 3% above 65 years (PCBS, 2008). Dependency ratio still considered high in Gaza Governorates in year 2007 around 89.1%.The natural increase rate was 3.3% (PCBS, 2008). According to the PCBS, 2008 Crud birth rate (CBR) "is the number of live birth per 1000 population" in year 2006 36.7/1000, total fertility rate was 4.6 and Crud death rate (CDR) 3.9 death per 1000 population maternal mortality ratio 15.4 per 100,000 live birth (PCBS, 2008).

Infant mortality rate (IMR) the number of live birth who die in the first year of live 28.8 per 1000 live birth (PCBS,2008) ; the IMR declined from 25 per 1000 since 1995 to 22.8/1000 live birth 1996(PCBS,2008). Early neonatal mortality the number of death of live born infant from birth to 7 day of live 9.7 live birth in 2004 ; late neonatal mortality the number of death of live born infant from birth after 7 day of live to 28 day of live 6.6 in 2004, and the leading cause of IMR in premature and low birth weight with proportion of 31.6%, congenital malformation with proportion 24.9, pneumonia and other respiratory disorder with proportion of 11.6%, infectious disease with proportion of 7.3%; Still birth 5.5 per 1000 live birth in 2005 (MOH,

2005). Neonatal mortality was 20.7 per 1000 live birth, post neonatal mortality rate was 8.4per 1000 live birth in year of 2006 (PCBS,2008).

1.8.3 Health care in Palestine:

In Palestine, the health care is provided by the governmental, non-governmental, UNRWA and private sectors. The MOH is responsible for a significant portion of the primary and secondary health care (MOH, 2005).

Governmental health service

Distribution of MOH primary health care shows that, there are 416 centers owned and supervised by the MOH, with 63.6% from the total centers, these centers distribute as 56 centers in the Gaza Strip. The MOH owns and operates 22 hospitals (10 in Gaza Strip and 12 in the West Bank), furnished with 2,815 beds (1,499 in Gaza Strip and 1,316 in the West Bank) (MOH, 2005).

United Nations Relief and Works Agency (UNRWA): UNRWA health program focuses on comprehensive primary health care, and the service are provided directly without cost to Palestine refugees through 53 primary health care center ,18 center in Gaza strip and 35 in West Bank (MOH,2005).

Non-governmental organizations (NGOs) in year 2005 operated 185 primary health care centers, 55 centers in Gaza strip and 130 in West Bank, the NGOs hospitals constitute about 39.5% of the total hospitals and furnished with about 33.5% of the total hospital beds in Palestine. They constitute about 37.1% of the total hospitals in the West Bank and furnished with about 39.8% of the hospital beds in the West Bank. In the Gaza Strip, they constitute about 45.5% of the total hospitals and furnished with about 24% of the hospital beds in the Gaza Strip (MOH, 2005).

The private sector there's hundreds of private setting operated by individual medical specialist (MOH, 2005).

Neonatal intensive care units:

Neonatal intensive care unit in Al -Shifa hospital:

AL- Shifa Hospital the biggest hospital in Palestine , it is located in the west part of Gaza, was established in 1946, developed over years, total numbers of beds are 590 beds (MOH,2007). The Neonatal Intensive Care Unit (NICU) has been established in 1986 the number of incubators are15, has been developed now to accommodate 27 incubators, the annual occupancy is1297 neonates (NICU Al-Shifa Hospital records).

Neonatal intensive care unit in Al-Nasser for children hospital:

Al-Nasser for children hospital it is located in the Gaza governorate, special children's hospital, the NICU has been established in 1973 started with 7 incubators now have 34 incubators, the annual occupancy is1651neonates (NICU Al-Shifa Hospital records).

Neonatal intensive care unit in Khan-younis (Naaser) hospital:

Khan-younis (Naaser) hospital it is located in khan-younis governorate, general hospital, and total beds 267 beds, the NICU has been established at 1989 started with 8 incubators now have 14 incubators ,the annual occupancy 343 neonates (NICU Al-Shifa Hospital records).

Neonatal intensive care unit in the European Gaza hospital:

The European Gaza Hospital is situated in the southern Gaza Governorate of Khan-younis. Established in1993; as a general hospital and total beds 240 beds (MOH,

2009). The NICU has been established at 2001 started with 20 incubators, the annual occupancy 739 neonates (NICU Al-Shifa Hospital records).

Neonatal intensive care unit in Shahadaa Alaqsa hospital:

Located in mid zone governorate, is general hospital total bed are74 beds. The NICU has been established at 2003 started with 8 incubators, the annual occupancy 343 neonates (NICU Al-Shifa Hospital records).

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Chapter (2)

Literature Review

I. Theoretical Framework for adherence to infection prevention and control:

After reviewing the literature, the researcher has used theoretical framework to describe the most common factors that could influence the adherence or non adherence to infection prevention and control protocols.

2.1.1 Theory of Planned Behavior: (TPB) (Ajzen, 1985, 1991)

The Theory of Planned Behavior (Ajzen, 1985) helps to understand how to change the behavior of the people, the Planned Behavior theory expect that the behavior is intended, and the behavior can be planned, according to this theory, human action is guided by three kinds of considerations, which considerations are crucial change behavior this considerations are:

Behavioral beliefs: beliefs about the likely outcomes of the behavior and the evaluations of these.

Normative beliefs: beliefs about the normative expectations of others, and motivation.

Control beliefs: beliefs about the presence of factors that may facilitate or impede performance of the behavior and the perceived power of these factors. The theory is based on links among beliefs, attitudes, perceived behavioral control and norms, and behavioral intentions. Figure (2.1) illustrate the theory.

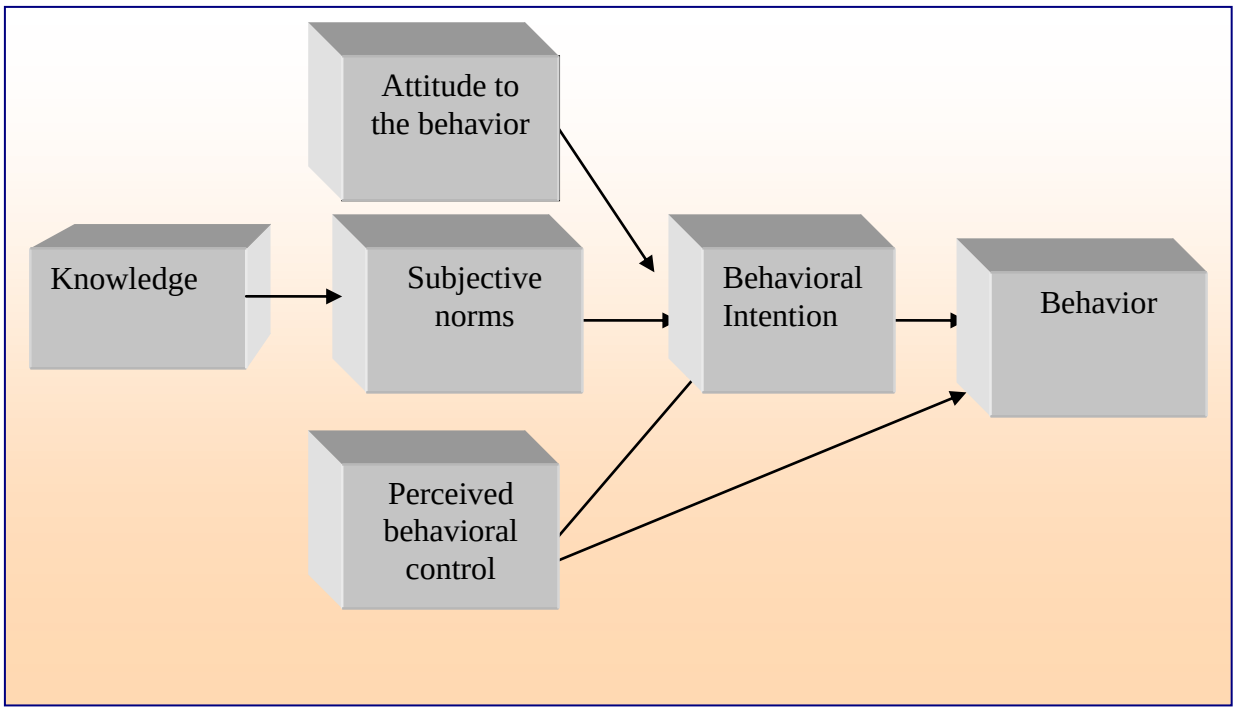

Figure (2.1): Diagram of theory.

1. **Source:http://www.istheory.yorku.ca/theoryofplannedbehavior.htm**

   11/10/2007

2. **http://people.umass.edu/aizen/tpb.diag.html 11/10/2007**

according to the literature were used the theory in the application of programs, training and protocol , focusing on behavioral change and changing attitudes ,not only to increase knowledge.

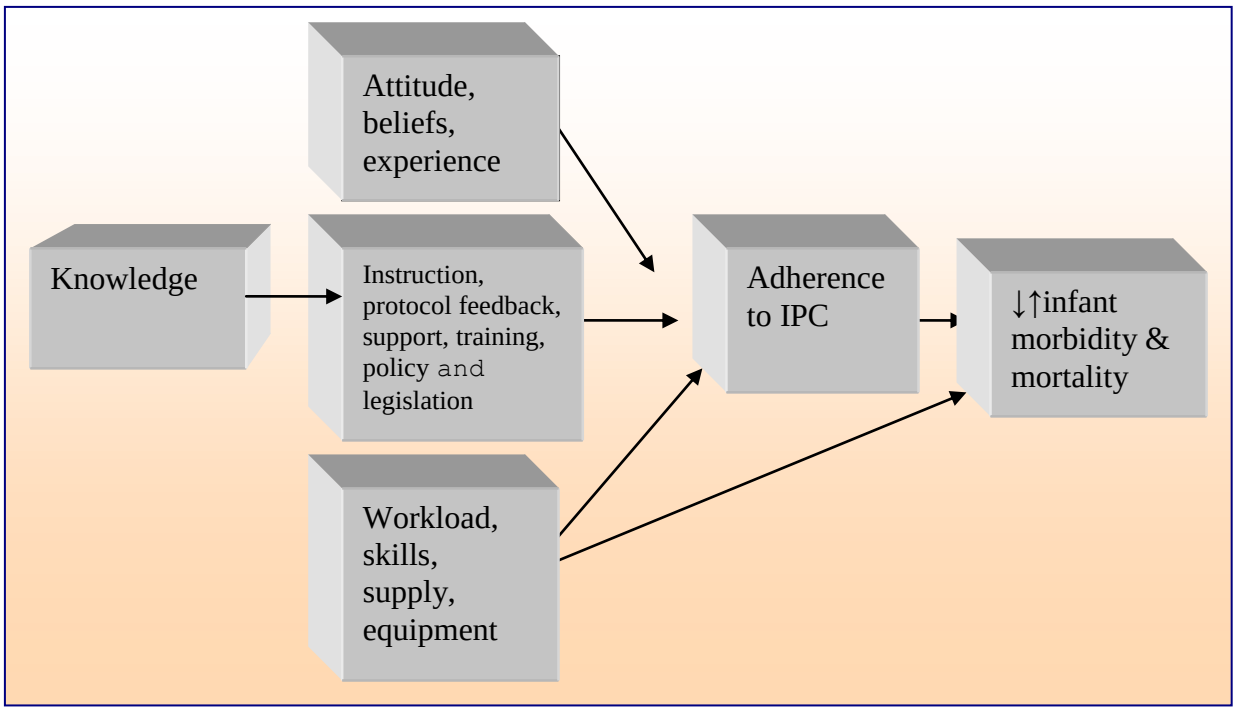

Figure (2.2): Diagram Application of theory

2.1.2 Application of the Theory

For implementation and application of the protocol, it is needed to change attitudes, beliefs and behavior not only to change knowledge of health care workers , moreover it is needed to provide the factors that help and facilitate or impede the adherence of HCWs to IPC protocols such as (supply, training), Figure (2.2) illustrate that Knowledge, continuous education, instruction, policies and legislation, guideline and feedback, training and updating information, and positive attitudes are important to modify and improve practices. The fewest years of experience had the highest knowledge and the group with a bachelor degree or more had highest knowledge of practices toward universal precautions (Motamed, et al, 2006), and the HCWs knowledge about infection prevention and control had impact of infection control practices, lack of knowledge, education, guideline and protocol and

disagreement with recommendation factors for poor adherence with hand hygiene (Pittet, 2001). Policy or guideline must be available to ensure adherence with the Infection prevention and Control Policy, ignorance of guidelines, insufficient time, high workload and understaffing, performance feedback and lack of scientific information demonstrating impact of improved hand hygiene and hospital infection rates (Pittet ,2001). CDC focus on the same factors influencing adherence with hand hygiene practices: lack of guideline, protocols, insufficient time, high workload and understaffing, time insufficient and the lack of scientific information, no role model from colleagues or superior, lack of administrative sanction of noncompliance, rewarding, lack of institutional safety circumstance, lack of institutional priority (Gerberding et al., 2002).These factors have been identified by the (CDC, 2002).

II. Literature review

Infection control is essential components in neonatal care and has an impact on the infant mortality and morbidity; for this many researchers and institutions give priority attention.

In this chapter, the researcher was reviewing some of these studies. Before the 1980, infection control systems were based on identifying at risk patients in hospitals and applying isolation systems or special treatments. The isolation approach failed to take account of the possibility of transmitting infection from asymptomatic individuals, particularly those with blood borne viruses or antibiotic resistant bacteria. By the mid1980, the acquired immune deficiency syndrome (AIDS) epidemic, created an urgent need for new strategies to protect health care workers (HCWs) from blood borne infections in their working environment. (CDC, 2007) In 1985 universal blood and body fluid precautions (universal precautions) were proposed by the Centers for Disease Control and Prevention, this new approach emphasized the universal use of blood and body fluid precautions regardless of a patient's presumed infectious status. The term 'universal precautions not applied nasal secretions, sputum, sweat, tears, urine and vomit, unless they contain visible blood in 1994 (CDC, 2007).

2.2 Infection transmission cycle

Invasion of the body with organisms that have the potential to cause disease or not depend on many factors: 1.Causative agent: the chain begins with causative agent whom may by bacterial, viral, rickettsial, protozoal, and fungal. 2. Reservoir: are the places where the invading organisms live and multiply. The reservoir is the environment in which the agent is found whether it is human, animals, soil, or inanimate matter; human reservoir can be either case or carrier. 3. Place of exit:

organisms may exit though various body systems such as respiratory tract, intestinal tract, genitourinary tract, skin lesions, and blood stream. 4. Mode of transmission: may be direct as person-to-person contact, animal, or indirect through an intermediate vehicle. 5. Mode of entry: this corresponds some what to mode of exit including respiratory tract, gastrointestinal tract, genitourinary tract, and mucous membrane through a break or burn skin. 6. Susceptible host: person who can be infected which depend on numerous factors including age, general health, nutrition, immunity, immunization, and number of organisms (Domani, 2003), this means that infectious diseases spread through infection chain; removal of any one of these factors prevents the spread of infection, which is the purpose of infection control and prevention protocols(Annex 3).

2.3 Definition of infection prevention and control:

Infection prevention and control: is various practices which, used appropriately, restrict the spread of infection. It is important health care workers, patients, and all members, contacts to adhere to the infection (WHO, 2004). The Center for disease control and prevention define IPC as: measures acting by health care facilities to minimize transmission of infectious agent these measure including many procedures such as proper hand hygiene, scrupulous work practices, and use of personal protective equipment (CDC, 2003). (Alvre, 2005) defended as the methods used to control and inhabit spread of infectious disease and its responsibility of all health workers, but (Leahy,2004) emphasized if broken of any links in the infection chain by using infection control practices to inhabit the pathogens spread to reducing infection

2.4 Infection control in the Neonatal Intensive care unites (NICU):

American Academy of Pediatrics and the American College of Obstetricians and Gynecologists recommended standards guidelines for Infection control in the NICU focuses on the following areas:1.physical setup explain the arrangement and organization of the unite space, ventilation, scrub area, isolation room ,2.administrative arrangement: includes the following surveillance for nosocomial infection, sibling visits, general housekeeping, cleaning and disinfecting Patient Care equipment, catheter-related sepsis American Academy of Pediatrics and the American College of Obstetricians and Gynecologists (2001).

Study of neonatal sepsis due to multidrug resistant Klebsiella Terrigena in the neonatal intensive care unit in Gaza, Palestine the study exposed the neonatal sepsis remains one of the leading causes of neonatal admission, morbidity, and mortality in developing countries. Klebsiella were the major cause of neonatal sepsis in Gaza in 2005 and management of infected patients is becoming a problem in developing countries. And recommended theirs need to carefully formulate therapeutic strategies to control infections in NICUs (Abu Elamreen, 2007).

A retrospective cohort study of nosocomial infection in a newborn intensive care unit (NICU), South Korea, the study found incidence rate for nosocomial infection was 30.3 neonates out of 100 admissions (Jeong, 2006).And he also added, the most common infections were pneumonia (28%), bloodstream infection (26%), and conjunctivitis (22%). Median time to nosocomial infection from NICU admission was 16 days; it took 15 days until occurring pneumonia, 17days for bloodstream infection, and 16 days for conjunctivitis (Jeong, 2006).

2.5 Factors influencing adherence to infection prevention and control:

Study of "Improving adherence to hand hygiene practice" the study describe factors influencing adherence to hand hygiene practice, these factors including: professional category (being a physician or a nursing assistant rather than a nurse) male or female, hospital ward, working time of day or week, during weekdays or weekend and insufficient numbers of sinks, low risk for acquiring infection from patients, Skin irritation by hand hygiene agents, is an important barrier to appropriate compliance, and ignorance of disagreement with guidelines and protocols, and explain that several barriers to hand hygiene (Pittet, 2002). Reasons reported by health care workers include skin irritation, inaccessible supplies, wearing gloves, ignorance of guidelines, insufficient time, high workload and understaffing lack of scientific information and reported reasons associated with poor compliance are insufficient numbers of sinks; low risk for acquiring infection from patients; belief that glove use obviates need for hand hygiene; and ignorance of or disagreement with guidelines and protocols (Pittet, 2002). Also, access to hand hygiene supplies, whether sink, soap, medicated detergent, other factors influencing compliance at the include lack of education and performance feedback; working in critical care (high workload), and lack of encouragement or role models from key staff. Factors related to the organization include lack of written guidelines, and lack of administrative leadership, sanctions, rewards, and support, Interventions to promote hand hygiene in hospitals should take into account variables at all these levels (Pittet, 2002).

Study of factors associated with hand hygiene practices in two neonatal intensive care units, an observational clinical trial research of hand hygiene practices in neonatal intensive care units (NICUs) by different product with an alcohol-based hand rub and

washing the hands when physically soiled with a nonantimicrobial soap used traditional hand washing with an antimicrobial soap containing 2% chlorhexidine gluconate the researcher put many categorize the patient, touches were classified by three variables as touching within the neonates environment but only outside the isolate ,touching within the isolate but not the neonate directly or directly touching the neonate ,and hand hygiene practices for each touch were categorized into five groups: cleaned hands and new gloves; uncleaned hands and new gloves, used gloves, clean hands and no gloves, uncleaned hands and no gloves (Cohen, Saiman, Cimiotti, Larson , 2003).The study found average each neonate immediate environment was touched 78 times per shift were more likely to use appropriate practices during touches directly to the infants were most common, only 22.8% of all touches were with cleaned and/or newly gloved hands ,and the mean number of direct touches by staff members with cleaned hands was greater in the using an alcohol-based hand rub than in the using antimicrobial soap (Cohen, Saiman, Cimiotti, Larson , 2003). Likewise the individuals observed during this study were adherent with the policies for hand hygiene standards and recommended to administrative action and improved products may be needed to assure acceptable practice (Cohen, Saiman, Cimiotti, Larson, 2003).

2.6 Knowledge Attitudes and Practices of IPC:

A cross-sectional survey study of all medical staff in two hospitals in Mazandaran Province Islamic Republic of Iran they found 65.8% of hospital A staff had heard about universal precautions compared with 90.0% of hospital B staff, among the staff respondents 40.6% had 0–5 years of experience in their job, 10.3% had 6–10 years, 15.1% had 11–15 years and 34.0% had more than 15 years of experience and (64.3%)

had a bachelor degree or more had the highest knowledge of and practices toward universal precautions and they found a significant relationship between age and knowledge of and practices toward universal precautions. Reported many of health workers had misconception that the universal precautions, and found general low understanding of universal precaution among health staff and medical students (Motamed et al, 2006).

Knowledge, attitudes and practices Universal Basic Precautions by medical personnel in a teaching hospital data collected by structured questionnaires self administered, the results are 92% respondents have knowledge about universal precautions, 32% indicated that contact by intact skin with infected blood or infected body fluids constitute exposure to HIV (Hesse et al. 2006). Ninety six percent 64% respondents disagreed (universal basic precautions reduce the risk of HIV transmission), 96% of the respondents agreed that (universal basic precautions should be practiced for all patients), and 94% of the respondents agreed that it is important to wear gloves when doing invasive procedures and the result of actual practice 88% of respondents indicated that they wore gloves routinely when performing invasive procedures on patients (Hesse et al. 2006).

Study of the knowledge and practice of universal precautions was carried out among final year medical and nursing students of university teaching hospitals in Nigeria, to assess the level of awareness of basic principles of universal precautions the result of this study found only 36.9% of the medical students were scored very well as against (46.2%) of nursing students. Sources of information of respondents about universal precautions about 19% from classroom, books/journals 27% seminars/ workshops,

12% the research found only 64.3% of respondent were familiar with universal precautions, 61% of respondent medical student (Bamigboye, 2006). The frequency of needle stick injury was 41.8%, level of knowledge of what constitute universal precautions was equally low among the respondents, and only 38.8% of the respondents had very good knowledge. Wearing of ward coat/gloves during clinical work 73% among medical and 7.7 (among nurses it is not compulsory for nurses) (Bamigboye, 2006). Added practice of regular hand washing after touching patience is higher among nurses 53.8% than medical personnel 37.9%, the practice after removing hand gloves is also higher among the nurses (57.7%) than among medical students (26.2%).The practice after removing hand gloves is also higher among the nurses 57.7%) than among medical students (26.2%), hand washing practices after exposure of hands to possible sources of contamination has been known to be a major precautionary measure against many communicable diseases (Bamigboye, 2006). The researcher conclude this study that level of awareness of universal precautions among the study population is very low knowledge and practice is observed to be higher among nursing students than medical students (Bamigboye, 2006).

But another study that aimed to determine attitudes and practice of infection control among practitioners involved in special care dentistry in United Kingdom collection of data by questionnaire from 680 members of the British Society for Disability and Oral Health; found 95% reported having a local infection control policy, most (81%) gave new staff training in infection-control procedures, 74% provided updates for established staff. Crispian et al, 2007). Also found high awareness of infection-control issues, and good reported compliance among dental workers (Crispian et al, 2007).

Level of knowledge and attitudes toward standard and isolation precautions among healthcare workers in a hospital assessed by an anonymous questionnaire was distributed to 2,000 healthcare workers at the University of Geneva Hospitals, Switzerland, study sample was randomly, median age of respondents was 39 years (range, 22 to 65 years); 71.9% were female and 25.6% were physicians, the median experience was 14 years, 24.6% of the respondents reported having participated in a training session on transmission precautions organized by the hospitals infection control team more nurses than physicians reported training (27.9% vs.5.1%), 55.9% have a good knowledge reasons for not applying transmission precautions, lack of knowledge was cited as the most important barrier 47.1%, followed by lack of time 41.7%, and lack of means 28% (Sax et al 2005).

2.7 Adherence to Infection prevention and Control:

Study was conducted to assess the compliance with infection control programs general dental practitioners in the private sector in North Jordan with infection control measures, data collected by questionnaire about infection control measures was distributed to 120 private practices, 67.3 % were males, and 32.7% were females, with a mean age of thirty-eight years, 36 percent were vaccinated against hepatitis B, approximately 82 percent wore and changed gloves, compliance rate of 13.6 percent, the compliant were mainly females and in the age group of twenty-five to thirty-four years (Al-Omari ,2005).

Askarian et al 2006, study of the compliance of personal hygiene and safety and its effect on nosocomial infection in Shiraz, Islamic Republic of Iran, and the data were collected through two checklists, by observe HCWs and complete the checklists (Askarian et al 2006). The results showed that variance in compliance of personal

hygiene among health worker where physicians and nurses were less compliant with personal hygiene practices than cleaners, fewer physicians had good scores 10% than nurses 32.2% and hospital cleaners 56.7%, availability of protective measures was better in teaching hospitals than non-teaching hospitals as were vaccination rates among staff (hepatitis B and tetanus/diphtheria) with physicians scoring highest. and recommend measures are needed to improve health workers compliance: education about infection control issues must be focused on HCWs and the need to improve the facilities to allow adherence to infection control policies to protect from high mortality and morbidity rates as well as increasing the financial costs, because of non-adherence of HCWs to infection control standards other studies and also recommended to elucidate the reasons for non-compliance with infection control measures and the level of knowledge, attitudes and practice regarding infection control isolation precautions. (Askarian et al 2006).

An observational study was carried out in Intensive Care Units (ICU) of University Hospital in La Havana, from four NICUs conducted by Garcell et al, 2008 in five adults ICUs, and three Pediatric ICUs to assess compliance with hand washing in Intensive Care Unit according ICU type and professional status, in 24 hours of observations, observers recorded 198 opportunities for hand washing 78 previous invasive procedures, and 120 previous non invasive procedures, the average compliance with hand washing was 62,9 % , hand washing was done before invasive procedures in 53,7 %, while before non invasive procedures was performed in 61,4 % of instances, the better compliance with hand washing was in neonatal ICUs 95,2 %, while in adult ICUs was 59,2 %, in pediatric ICUs was 57,9 % (Garcell et al, 2008). And found compliance varied with professional status, nurses had better compliance

with 66,4 %, and physicians and technicians had compliance rates of 59,1 % and 46,7 % (Garcell et al, 2008)

Askarian et al 2002 found in survey on adoption of measures to prevent nosocomial infection by anesthesia personnel, found high awareness of the possibility of acquiring HBV and aware of the risk of Human immunodeficiency virus infection, 61.5% had received complete vaccination against HBV, with 5.0% never having had the vaccine. The associations between previous exposures to needle stick injury and history of HBV vaccination was not statistically significant. Recapping of needles was reported by 66.2% of respondents. All needle stick injuries actually reported no action was taken in 43.7% of cases and adequate cleaning of instruments, 17.4% reported wearing gloves and also recommended to establish training program of infection prevention and control (Askarian et al 2002).

2.7.1 Occupational hazards in sharp and needles injures

In cross sectional observational study aimed to assess safe injection practice among health-care workers in Gharbiya Governorate, Egypt, the result show lack of infection control policies in all the facilities and a lack of many supplies needed for safe injection, and found, 66.2% of the interviewed health-care workers reported that they had experienced at least 1 needle-stick injury during their working life. The commonest reported cause of needle-stick injuries among the health-care workers during two-hand recapping of needles followed by during waste collection and then while needle flexing, there is lack of training of all health care workers on different practices related to safe injection .Only 11.3% had received a full course of hepatitis B vaccination (Ismail et al, 2007).

Health care workers (HCWs) are exposed to blood borne pathogens, especially HBV, and human immunodeficiency virus through job related risk factors like needle stick, stab, scratch, cut, and other injuries (Wicker et al, 2007). This study was to investigate the frequency and causes of needle stick injuries in a German university hospital the study focuses on injuries caused by contaminated sharps. Wicker et al, 2007found 35.6% physicians, 58.4% nurses, 4.3% cleaners, and 1.7% laboratory technicians, found 31.4% of HCWs had exposed at least one needle stick injury in the last 12 months, and physicians have the highest risk to experience needle stick injuries 55.1% followed by nurses with 22.0%. (Wicker et al, 2007). Also discussed all of needle stick injuries can be avoided by the introduction of safety devices, and 29.2% might have been avoided, while 36.7% could not have been avoided, and needle stick injuries could have been prevented by organizational measures (Wicker et al, 2007).

2.7.2 Adherence with standard (Universal) Precautions

Study of Non compliance with Universal Precautions among nurses and laboratory technicians in Alexandria, Egypt, study done in 5 general hospitals selected randomly, the result showed the age of the study sample ranged between 25 – 40 years that non-compliance varied among the different guidelines of universal precautions (Shama, 2007). The percentage of non-compliant nurses and lab technicians was extremely high for certain guidelines, such as : changing gloves between patients 77% and wearing gowns 72.5%, and non compliance for washing hands before dealing with patients 63.6%, disposal of needles and sharps in special containers 60.3% and wearing gloves 45.2%. Non compliance was lowest for washing hands after gloves removal 21.3%, and found no association was found between non compliance and

knowledge about blood borne diseases and universal precautions, and years of experience and educational level (Shama, 2007).

2.7.3 Adherence to hand washing

Duggan et al., 2008 studied the correlation between level of professional education and rate of hand washing compliance in a teaching hospital, by observation of hand washing total of 2,373 observations were performed (Duggan et al., 2008). The rate of hand washing compliance among nurses was 91.3% medical attending physicians had the lowest observed rate of compliance 72.4%, the compliance rate in the surgical intensive care unit was more than 90%, the compliance rate was better during the 3 pm–11 pm shift, compared with the 7 am–3 pm shift, the compliance rate was better during the first part of the week, and recommended for future research address the different motivating factors for hand hygiene among nurses and physicians to increase compliance (Duggan et al., 2008).

Adherence of HCWs to recommended hand hygiene practices the observational studies of hand hygiene adherence, of HCWs to recommended hand hygiene procedures has been poor, with mean baseline rates of 5% to 81% (overall average:
40%, several investigators reported improved adherence after implementing various interventions, but the majority of studies had short follow-up periods and did not confirm whether behavioral improvements were long-lasting other studies established that sustained improvements in hand washing behavior occurred during a long term program to improve adherence to hand-hygiene policies (CDC ,2002).

Identify beliefs and perceptions associated with intention to comply with hand hygiene among neonatal healthcare workers study was conducted in the neonatal unit of the University of Geneva Hospitals, self-administered questionnaire 74 items based on the theory of planned behavior was distributed to 80 neonatal healthcare workers was individually distributed all neonatal unit healthcare workers present during the study period to assess intention to comply, attitudes toward hand hygiene, 76% the response rate was, 75% believed that they could improve their compliance with hand hygiene, most respondents considered it useful to perform hand hygiene 53% to 89%, as expressed by a positive attitudes either before or after any type of direct contact with the patient (Silva, 2005). Positive attitudes toward hand hygiene for care of different body sites of the same patient, after contact with equipment linked to the neonate, the mean score for intention to perform hand hygiene was 6.5, reported reasons for difficulty to perform hand hygiene skin irritation, a preference for the use of gloves, and failure to remember were reported by more than half of the healthcare workers as the main reasons for perceiving compliance with hand hygiene as a difficult task (Silva, 2005).

Observational study in five intensive care units of a university hospital in Berlin, Germany monitoring of medical person in two period regarding compliance with antiseptic hand rub (Eckmanns et al 2006). Use of antiseptic hand rub is one of the most important means of preventing nosocomial infections. In the first period, the personnel had no knowledge of being observed, since the person monitoring them was a research nurse present in the ICUs who regularly reviewed the patients' medical records. Ten months later, the second observation period was announced to the personnel in the ICUs in advance, the overall rate of compliance was 29%, in the first period and 45% in the second period, compliance in the 5 ICUs varied: in ICU A,

there was 47% compliance ICU B, 39%; in ICU C, 36% in ICU D, 30%; and in ICU E, 47% (Eckmanns et al 2006). Also among physicians the rates of compliance were 25% and 47%, among nurses. The rates of compliance in the two periods were 30% and 58%, compliance with antiseptic hand rub use were statistically significant between the occupational groups (nurses had the highest c compliance and physicians had middle compliance) and between indication for AHR use before procedures and indication for AHR use after procedures(Eckmanns et al 2006).

Pittet et al., 2000 study to promote hand hygiene by implementing a hospital-wide program, with special emphasis on bedside, alcohol-based hand disinfection, measured nosocomial infections in parallel to monitor the overall compliance with hand hygiene during routine patient care in a teaching hospital in Geneva, Switzerland, before and during implementation of a hand-hygiene, seven hospital-wide observational surveys were done twice yearly. Secondary outcome measures were nosocomial infection rates; attack rates of methicillin-resistant Staphylococcus aureus and consumption of hand rub disinfectant (Pittet et al., 2000). The result show observed more than 20,000 opportunities for hand hygiene. Compliance improved progressively from 48%, to 66%, although recourse to hand washing with soap and water remained stable, frequency of hand disinfection substantially increased during the study period. Hand hygiene improved significantly among nurses and nursing assistants, but remained poor among doctors. During the same period, overall nosocomial infection decreased (prevalence of 16.9% to 9.9% in $p=0.04$), methicillin-resistant Staphylococcus aureus transmission rates decreased (2.16 to 0.93 episodes per 10,000 patient-days; $p<0.001$), and the consumption of alcohol-based hand rub solution increased from 3.5 to 15.4 L per 1000 patient-days (Pittet et al.,2000).

2.7.4 Adherence to IPC and training programs

In a neonatal intensive care unit study was conducted in the NICU, multimodal intervention to assess the frequency and nature of patient contacts in neonatal intensive care units and observe the compliance of nurses and doctors and technique of hand hygiene among HCWs before and after the implementation of a multimodal intervention program consist of "hand hygiene education, enhancement of minimal handling protocol and clustering of nursing care, liberal provision of alcohol-based hand antiseptic, hand hygiene facilities, ongoing regular hand hygiene audit, and implementation of health care-associated infection surveillance", and by observation of nature and frequency of patient contacts, the hand hygiene compliance, and hand-washing techniques of HCWs, and to investigate factors for noncompliance (Barbara , 2004). The study was repeated six months after the completion of the intervention program, which extended over 1-year period, the researcher found more marked improvement was observed for high-risk procedures 35%-60%. Enhancement of minimal handling and clustering of nursing procedures reduced the total patient contact episodes, concurrent decrease in health care-associated infection rate and increase in hand hygiene compliance was observed in this study and illustrate the task-orientated study suggests that an effective education program can improve hand hygiene compliance education program can improve hand hygiene compliance (Barbara , 2004) .

Study aimed to assess an educational training program for nurses working in maternal and child health centers in Assiut regarding infection control conducted by Hassan et al., 2004. It was conducted in all maternal and child health centers in Assuit City work system in maternal and child health centers is divided into two shifts; morning and afternoon (Hassan et al., 2004). The total number of the study sample in all maternal

and child health centers were 72 nurse, two tools were designed to collect data; questionnaire was used as a tool for data collection in both pre & post test of the training program in order to measure the knowledge level of the trainees. The second tool observation (chick-list) checklist was developed for assessing nurses' performance; these tools were used before and after the training program to evaluate the extent to which the training program affected the nurse's performance. Observation was done during routine work, the result of this nearly half of the sample there age ranged from 20- 30 years. Years of experience 31.9% had less than 5 years, 33.3% their experience ranged between 5-15 Years, and 34.7% had experience above 15 years, qualification degree 93 % had diploma of nursing, compared with 6.9% who had midwifery degree (Hassan et al., 2004). All nurses' lack of knowledge related to the concept of epidemiology only 40.2% of the nurses under the study had sufficient knowledge regarding the concept of epidemiology before exposure to the program, the percentage increased to 88.9% after administration of the program (Hassan et al., 2004).The majority of nurses had proper hand washing techniques on the post test with a statistical significant difference of below 0.01. As for nurses' knowledge of the occupational hazards to which they may be exposed during work in maternal and child health centers, the implementation of the program was very effective in enhancing nurses' knowledge and performance (Hassan et al., 2004). The results revealed that the majority of nurse's practices were adequately performed about hand washing on pre and post test; wash their hands from 87.5 to100, technique of hand washing.33.3 to 76.4, while low frequency of the protective barriers was observed on pretest 94% wearing gloves to 98.6%, nurse's practice about infection control. Knowledge about universal precaution12.5 to80.6, occupational hazards in needle stick 97%, and the researcher recommended periodic refreshing training courses

should be provided in order to keep nurses of up dating knowledge and practice regarding to infection control (Hassan et al., 2004).

2.7.5 Adherence with gown and uniform:

Manian ,2007 study compliance with modified contact precautions policy regarding routine gowning in intensive care units and general wards, prospective observational study ongoing intensive educational programs related to the importance of compliance with modified contact precautions have been conducted for HCWs at the medical center, including meetings with supervisors of nursing and other appropriate departments, monthly ward meetings of the nursing staff, and individual interaction with HCWs by infection control professionals and the hospital epidemiologist during their daily hospital rounds. Manian, 2007 add nursing personnel are asked to familiarize visitors with the modified contact precautions policy (Manian, 2007). Modified contact precautions signs clearly stating that gowns and gloves are required before entry into the room are posted on the door. Compliance with routine gown use was observed; overall compliance 73%, HCWs 76% and visitors 65%, visitors in the ICUs 91% were more likely than visitors in the general wards, physicians had a significantly lower rate and respiratory therapists a significantly higher rate of gown compliance than nurses, HCWs had a significantly lower gown compliance rate in the ICUs (Manian ,2007).

2.7 Hospital acquired infection (nosocomial infection):

Hospital-associated infections that refer to any infection that develops during or as a result of an admission to an acute care facility (hospital) and was not incubating at the time of admission (CDC, 2007).

Nosocomial infection control is important for three main reasons: to prevent spread of infections from patients to health care workers (HCWs) and vice versa; to prevent bacterial resistance; and to avoid waste of financial resources (Askarian et al, 2006) and also adding major reason for transmission of microorganisms is because of lack of personal hygiene in HCWs, especially improper hand washing, disposal of sharp instruments and use of personal protective devices, such as gloves and masks, to prevent nosocomial infection by two basic principles the first separate the infection source including isolation infected patient and aseptic techniques; and the second cut off any rout of transmission by universal or standard precaution .

Chapter (3)

Methodology

Methodology

In this chapter the researcher address issues relating to methodology used to answer the research question. It begins with the study design, the study population, setting of the study, eligibility criteria, data collection methods, the content validity index and piloting of the instruments, also illustrates the method of analysis, ethical considerations and the limitations of the study.

3.1 Study design

The study design is descriptive cross sectional analytic design. This design is appropriate for description of the status of phenomenon and its relationship between variables. This design is relatively economical and needs short time and is more practical.

3.2 Study population

The study population included all nurses and physicians who were working in the NICUs in the MOH Hospitals in Gaza Governorates who met the eligibility criteria. They were 128 subjects who were work in NICU at MOH hospitals; 45 subjects from Al -Shifa hospital, 26 subjects from Al-Nasser hospital for children, 17subjects from Khan-Younis hospital, 27 subjects from European Gaza hospital, and 13 subjects from Shuhadaa Alaqsa hospital.

Observation population included all nurses and physicians who were working in the NICUs in the Al -Shifa hospital and European Gaza hospital they were 72 subjects with percent of 56% of total population.

3.3 Setting of study

This study was carried out in the neonatal intensive care units in MOH in Gaza Governorates: Al-Shifa hospital, Al-Nasser hospital for children, Khan-younis (Naaser) hospital, European Gaza hospital, and Shuhadaa Alaqsa hospital.

3.4 Period of the study

The study was conducted from February 2008 to November 2008; after obtaining the approval of the proposal by School of Public Health – AL-Quds University in July 2008, and after obtaining the approval from the Director General Hospitals; the data collection started with a pilot study, then actual data collection was started in June 2008. Data management was conducted in September 2008, writing the final report continued till November 2008.

3.5 Response rate:

The response rate was 92.2% , and the number of respondents were 118 distributed as; 44 respondents from Al- Shifa Hospital , 21 respondents Al -Nasser Hospital, 26 respondent from the European Gaza Hospital and 10 respondents from Shahadaa Alaqsa Hospital ,17 respondents from Kan Younis Hospital, 58.5 % of respondents nurses and 41.5%2 physicians. Male is consists 54.2 respondents.

3.6 Eligibility criteria

3.56.1 Inclusion criteria

Official physicians and nurses who are in direct contact with patients in NICU in governmental hospitals in Gaza strip.

3.6.2 Exclusion criteria

Any trainee whether physician or nurse, any other health worker in the NICU, and cleaners.

3.7 Data collection

Data were collected by three instruments: Self administered structure questionnaires, structured observation checklist, and assessment structure checklist of physical environment in the NICU. Data collection instruments developed by the researcher in the light of "Palestinian infection prevention and control protocol " and "Infection Control in the NICU –Recommended Standards Edition by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists". Draft of the instrument was done by the researcher, and then final modifications were done after sent to the expert.

3.7.1. Self administered structure questionnaires

The questionnaire was arranged to be clear with no complex terms, double parallel questions were avoided as well as duplication in the question in order to facilitate the answer of question and it is arranged as the following:

a. Personal and professional information

b. Gender, Type of work, Year's of education, Year's of work in NICU, general information about IPC.

c. Evaluation of infection prevention and control (Annex4, 5).

The questionnaires were distributed by the researcher to all nurses and physicians work in NICUs who meet the eligibility criteria, after giving them instructions how to fill it, then left him to fill it; while still in the unite to give him any explanations they needed, after that the questionnaires were collected by the researcher.

3.7.2. Assessment structure checklist of physical environment in the NICU:

Aim to examining the adequacy of physical equipment and supplies in the units for application of IPC protocol (Annex 6).

Assessment of physical environment done by structure checklist, filling by the researcher with help of head nurse in the unit, by check the all items of physical environment if applied or not.

3.7.3 Structured observation checklist:

It's a data collection method to observe the phenomena on its natural situation. It is intended to observe HCWs practice in their natural setting, used direct observation by the researcher and assistants in three NICUs in Al-Shifa hospital, and European Gaza hospital in two different Governorates. It represents the largest two NICUs; they were

72 subjects represent 56% of sample size and two different systems of work, as a selecting sample that's related to the observation method requires high time and cost, more training of assistants, due to geographical distance of the hospitals, and fuel crisis were it is the main limitation during data collection period (Annex 7).

Data were collected by the researcher with three qualified assistants who got explanation and good training and prepared well how to observe the subject in the same way as the researcher, after were tested on a pilot sample. During the process of observation the researcher was do random samples after assistants to make sure the validity of the observation, and do observation with assistant work in the same unit; to minimize biases and Hawthorne effect. The researcher used direct observation, observed subjects during the three shifts, observes practice three events, and recorded applied or not applied.

3.8 Content Validity Index:

The researcher designed the instruments for the purpose of the study, after reviewing many related studies to the subject. The validity of the scales was examined by sending the constructed collection instruments with enclosed covering letter about the objective of the study to eight experts working in the different field including researchers, neonatologists, nurses, epidemiologist, and statistics; in order to give their views on the dimensions of the statements of the collection instruments in order to increase the content validity of the instruments. According to their suggestions and advices, some change modifications and additions was introduced in the data collection instruments.

3.9 Reliability

In order to minimize inter observer and intra observer variation, the researcher conduct training of the assistants who help the researcher to complete the observation check list in data collection. All observation check list were reviewed with assistants to avoid mistakes and to ensure that all the assistants were following the same method in data collection as the researcher.

3.10 Pilot study

Pilot study was conducted before starting the data collection and after experts evaluation had been done .The piloting process aiming to help in identifying problem in the instrument and test the data collection instruments for validity and reliability. Piloting allows the researcher gaining experience with dealing with data collection instruments, and to point out weaknesses in wording and predict response rate. Also determine the real time needed to fill the questionnaire and also to identify area of difficulties and ambiguity. Piloting was performed on twelve respondents from the sample size, full explanations were made to each participant regarding the purpose of the study, and confidentiality will be maintained, as the result of piloting few modifications done to data collection instruments.

3.11 Statistical analysis

Data analysis was been processed and analyses using Microsoft Excel and SPSS (statistical package for social science version 13):

- Review of the all instrument.

- Coding the question

- Appropriate entry model
- Coding variables
- Data cleaning
- Frequency and cross tabulation of the result
- Advanced statistical analysis, statistical relationship between variables and IPC was assessed with confidence interval (CI) of 95%. T test and Analysis of Variance (ANOVA) were used to compare mean among different variables.

3.12 Ethical consideration

This study was obtained Helsinki committee approval. (Ethical committee in Gaza strip) (Annex 8).

This study was obtained MOH approval. (Annex 9)

Every participant in this study was received complete information and explanation about the research purpose, nature of his or her participation in the study

All participants were received consent form (Annex 4.5).

Anonymity was given to all participants, the questionnaire will be returned without any identifying information.

Maintain confidentiality all the time during the study

Every participant was given the right to refuse participation or withdrawal at any time, and have option to participate.

3.13 Limitations of the study

The main limitations were:

* Time limitation

* The small size of target population that imposed on selection of study sample.

* Limited educational resources particularly updated journals and statistics.

* Lack of resources including budget and facilities especially during the economic siege on Gaza Strip.

* Unstable Political situation and fuel crisis.

* Hawthorne effect

Chapter (4)

Findings and Discussion

Findings and Discussion

This chapter presents the main findings of the study, including the characteristic of the study population, knowledge about IPC protocols, infection prevention and control attitudes and practices, in addition observational data about organization factors related to Infection prevention and Control NICUs. In this chapter also the researcher explain the findings of the study compared with other global and regional studies and attempts to interpret and discuss the results and the findings of study.

4.1 Characteristic of study population:

The characteristics of study population are summarized in table (4.1) the table illustrates that the distribution of study population by the hospitals. The majority of cases were from AL-Shifa hospital (38%) followed by European Gaza hospital (22%), AL-Nasser H. (18), Kan-younis H (14%), where Shahadaa Elaqsa represented the least presented (8%) These results represent the study population as show in Figure (4.1)

Table 4.1: Summary table of characteristics of the study population

Variables		Frequency	Percentage
Hospitals	Al-Shifa H	44	37.3
	AL-Nasser H	21	17.8
	kan-younis H	17	14.4
	European H	26	22
	Shahadaa Alaqsa H	10	8.5
Gender	M	64	54.2
	F	54	45.8
Work	Physician	38	32.2
	Nurse	80	67.8
Experience	1-5 years	66	55.9
	6-15years	39	33.1

	<15years	13	11

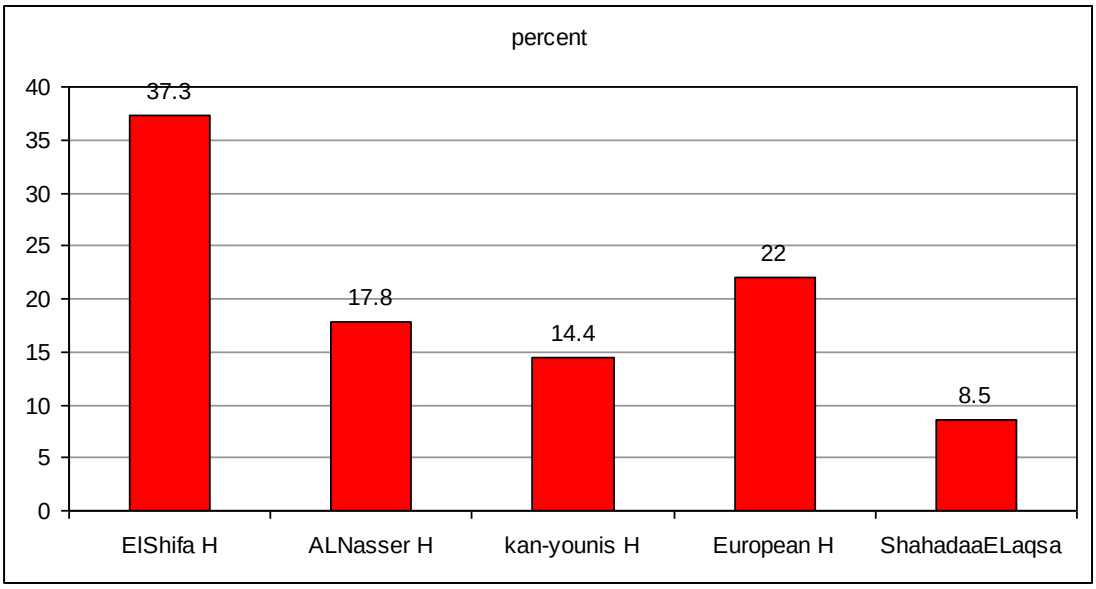

Figure 4.1: Distribution of the study population by hospitals.

Males represented 54% of the study population and 46% of study population were female, Figure (4.2).

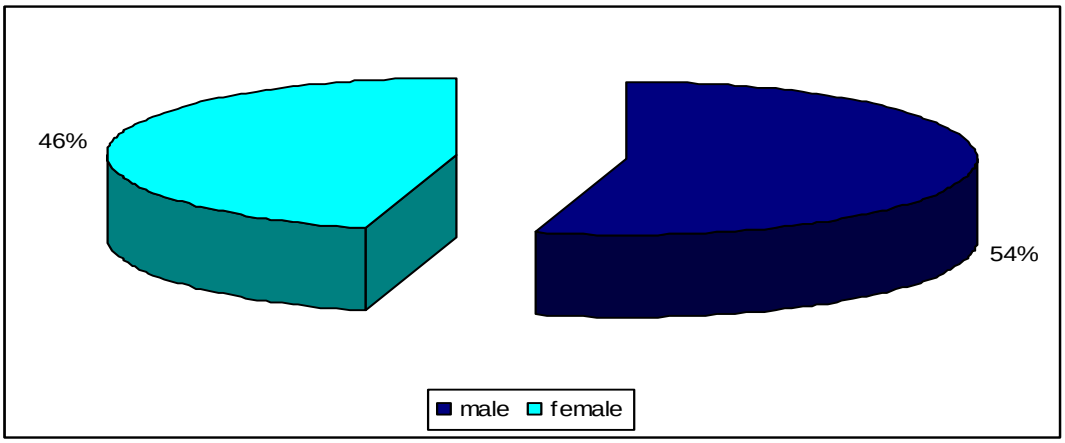

Figure 4.2: Distribution of the study population by the gender

As table (4.1) illustrates 32.2% of study population were physicians, 67.8%were nurses, 55.9% of study population had less than 5 years experience, 33.1 between 6-15 years, and 11% had more than 15 years experience.

In the previous study (Motamed et al., 2006) 66% of respondents had less than 15 years, this result is similar to the result of (Hassanet.al., 2004) about 65% of respondents less than 15 years, in this study the majority of respondents 89% less than 15 years experience; that mean the majority of HCWs have good opportunity for improvement, training, and development .The respondents classified as 66.5% male and 33.5% female respondents while study of (Motamed et al., 2006) study conducted Mazandaran Province (Iran) found 34.9% of respondents males and 65.1% females. The demographic classification can influence the adherence (Pittet, 2002) study factors influencing adherence to hand hygiene practice, these factors include: professional category (being a physician or a nursing assistant rather than a nurse) male or female, and hospital ward.

4.2 Infection Prevention and Control protocols:

The researcher examined the general information about IPC by number of questions, summarized in table (4.2); the results showed most of the study population don't have a copy of IPC (87.3%). And only 29.7% of the participants have access to IPC protocol, they were distributed as follow according to the source of obtaining the protocol figure (4.3): 20% from library and 20% from internet, 45% from hospital, and 14.3 from units, while the protocols not available in the units; that indicate the most important priorities to provide copies of the protocol in the units and in the hospitals. About 73% of HCWs have knowledge about the standard precautions of IPC. Knowledge about the existence of Palestinian infection prevention and control protocol 27% of respondents know about existence of Palestinian infection prevention and control protocol, figure (4.4), and within those know that 47.4% of them only know about its contents, and 37.8 % of them believe that applied in NICUs.

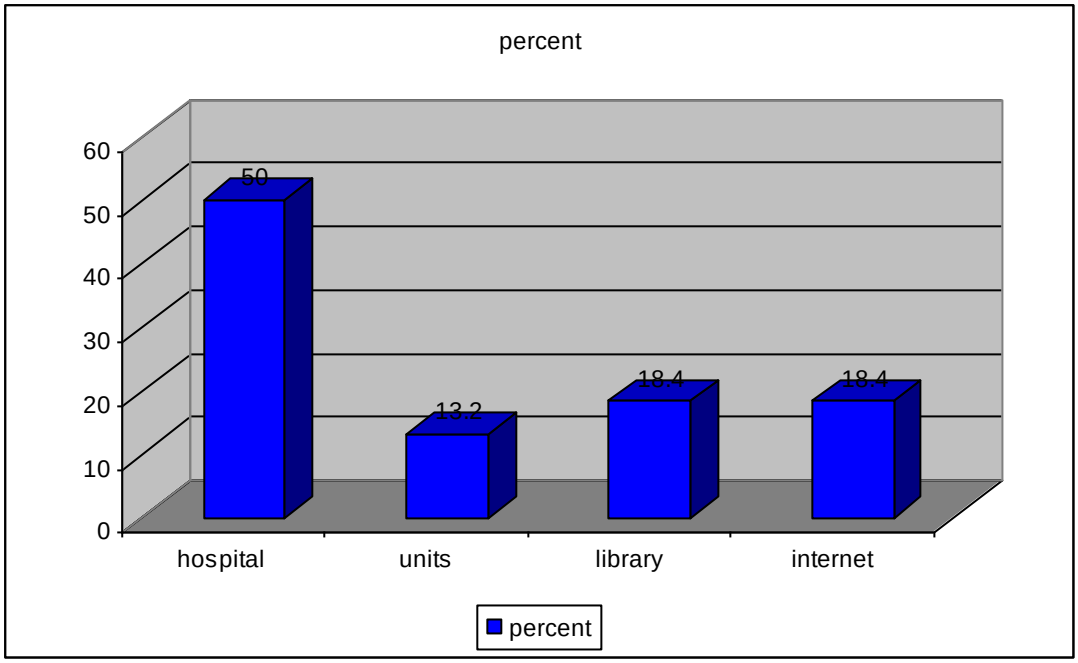

Figure 4.3: Sources of obtaining the IPC Protocol

About training courses only 28% of respondents received training course about IPC and while 28.8% reported that the hospital provides continuous updating information and instruction about IPC. The vast majority 96.6 of respondents feel they need to learn more about IPC.

The hepatitis B vaccination rate 85.6%, while 78% of respondents exposed to used needle and sharp instrument injury.

System of performance evaluation (punishment and reward) 88% of HCWs reported that is no system of punishment and reward for the IPC.

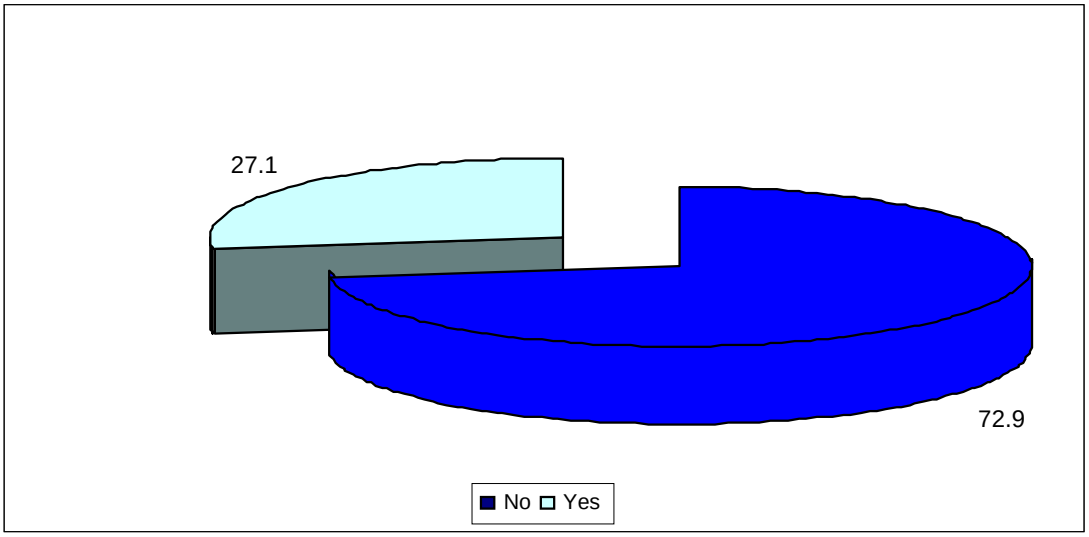

Figure 4.4: Knowledge about the existence of Palestinian IPC.

As the results show that a great obstacles to implement the protocol; the lack of availability of the organization evidence for that it is absence of protocol in units and also lack of continuous updating information and instruction about IPC. Likewise, performance evaluation (punishment and reward) system, so that must to conduct specific policies and measure to enhance adherence to IPC. (Crispian et al., 2007) found (95%) having a local infection control policy (81%) gave new staff training in infection control procedures, (74%) provided update for established staff, among reason for poor adherence with hand hygiene include lack of institutional priority for hand hygiene, need for administrative sanctions for noncompliance or rewards for compliance, and lack of an institutional climate that encourages safety (Pittet, 2001). The hand washing compliance rose from 28% to 81% after the introduction of an education program with performance feedback (Barbara, 2004) (the availability of the organization illustrates in details later in assessment of physical environment in NICUs).

Table 4.2: Summary table of selected IPC variables.

Variables	Yes		No	
	Frequency	Percentage	Frequency	Percentage
Have a copy of infection prevention and control protocol	15	12.7	103	87.3
Have any access for IPC	32	27.1	86	72.9
knowledge about the (universal) standard precautions of IPC	86	72.9	32	27.1
Do you know is there Palestine IPC protocol	32	27.1	86	72.9
Received any infection prevention and control training course	33	28	85	72
Did the hospital provide continuous update information and instruction about IPC	34	28.8	84	71.2
Did you feel that you need to learn more about infection prevention and control	114	96.6	4	3.4
Have you ever been vaccinated for hepatitis B	101	85.6	17	14.4
Exposed to used needle or Sharpe instrument injury	92	78	26	22
Is there a system of punishment and reward for the IPC in the unite	104	88.1	14	11.9

Its clear from the findings that lack of knowledge about existence of Palestinian IPC protocol, and content of the Palestinian IPC protocol, when the knowledge important to adherence of IPC, CDC emphasized factors influencing adherence to hand-hygiene practices among these factors lack of knowledge (Pittet, 2002), so that need to familiarization the HCWs of the existence of the of Palestinian IPC protocol, and its content.

Knowledge about the Standard Precautions "universal precautions" other study found in two different hospital found 65.8% and 90.0% staff had heard about universal precautions but the hospital B in the same study (Motamed et a,l2006), while (Bamigboye et al, 2006) found 64.3% of respondents were familiar with universal precautions. Ninety-two percent of respondents have knowledge about universal

precautions (Hesse, 2006). The results of this study consistent with the results of other studies, the study showed low understanding of universal precautions among health care workers; that may be related to the lack of post-employment education training (on job) about universal precautions; so need to updating the HCWs knowledge about standard precautions and on job training about it.

Low percent of HCWs received training course; this need to establishment of a training program for training of HCWs to enhance of knowledge, skills and educates of HCWs for the basic elements of infection control and, training would be helpful to empower their skills and promote practices, HCWs willing of to get training and need to learn more about IPC; that mean the HCWs have good awareness about importance of training. The results found high rate of exposure during use of needle and sharp instrument (78%) yet the results were better than the results of study was conducted in Assiut University by (Hassan et al., 2004) the study explore the health workers exposure during work to needle stick 97.2%, while the results of a study conducted in German university hospital were better than our results since the study found 31.4% of HCWs had sustained at least one needle stick injury in the last 12 months (Wicker, 2007), and in study by (Bamigboye, 2006) the needle stick injury was 41.8%, needle stick injury of HCWs are an important occupational hazard lead to infections with blood borne pathogens like hepatitis B, and the health care workers are high risk for expose to hepatitis B, that related to low adherence to dealing healthy with sharp disposal and low adherence of organization (unites) regarding sharp disposal (as will explained later). On the other hand 15% of HCWs unsafe from hepatitis B infection while the incidence of hepatitis B according to annual report 1.06 / 100,000 population (MOH, 2006). Its acceptable compared to other neighboring countries where the percent of HCWs in private dental clinics in Jordan were vaccinated

against hepatitis B was 36% (Al-Omari, Al-Dwairi , 2005), while 11.3% had received a full course of hepatitis B infection in health-care workers in Gharbiya Governorate, Egypt (Isamil et al., 2007). Another study conducted on anesthesiology personnel of different educational levels in the hospitals of southern Islamic Republic of Iran found only 61.5% had received complete vaccination against HBV (Askarian ,2002) our result was found acceptable compared with other countries around , but need to sustainability and also improvement, and HCWs should to follow the instructions when dealing with blood and contaminated instruments, where Palestine like other countries in the middle East intermediate prevalence rate of hepatitis B infection (MOH,2005) .

4.3 Infection prevention and control practices:

The researcher examined IPC in the NICUs by examined selected variables related to IPC summarized in table (4.3), (56%) of respondents indicated that they "all health care workers washing hand when arriving at work," 55.6 % of" HCW wash hands before touching the newborns".

As shown previously the IPC practices the mean score 2.87 and percent 56% that indicted the IPC practices in the NCUs it is low.

Actual practices measurement by structured observation check list

Table 4.3: Summary table of IPC practices in NICUs

Variables	Mean	Percent
All health care workers washing hand when arriving at work	2.79	55.8
All HCW wash hands before touching the newborns	2.78	55.6
All HCW wash hand after touching the newborns	2.98	59.6
Are all health care workers abiding to wearing the NICU uniforms	2.78	55.6
Sterile long sleeved gown mask sterile gloves worn by all personal who have direct contact with sterile filed during surgical & invasive procedure to the neonate	2.16	43.2
HCWs removing jewelry hand watch and ring when washing hand	2.58	51.6
Using sterilized equipment and sterile procedure for wound dressing and invasive procedure	4.15	83
HCWs don't recapping the contaminated needle break or bend before disposal	2.75	55
HCWs Don't remove used needles from syringe before disposal	2.65	53
Infant who remain in the incubator for an extended period transferred periodically to different disinfected unit	2.86	57.2
Place unclean equipment immediate after use in 0.05% chlorine	2.69	53.8
Prevent any visitor with symptoms of influenza fever upper respiratory tract infection from visit.	3.24	64.8

4.3.1 Structured observation check list:

Measurement of actual practices by structured observation checklist, the researcher categorized IPC practices to five categories wearing uniform, hand washing, wearing gloves, antiseptic and disinfectant, and sharp disposal.

Its clear from the preceding of adherence to practices IPC according to findings of the questionnaire percent score 56%, while according to the observation 52.2%; these two

findings harmony to each other, and the two findings indicate low adherence and poor implementation of IPC protocols.

4.3.2 Wearing uniform:

The percent of who are adherent to wear uniforms 73.1% as shown in figure (4.5)

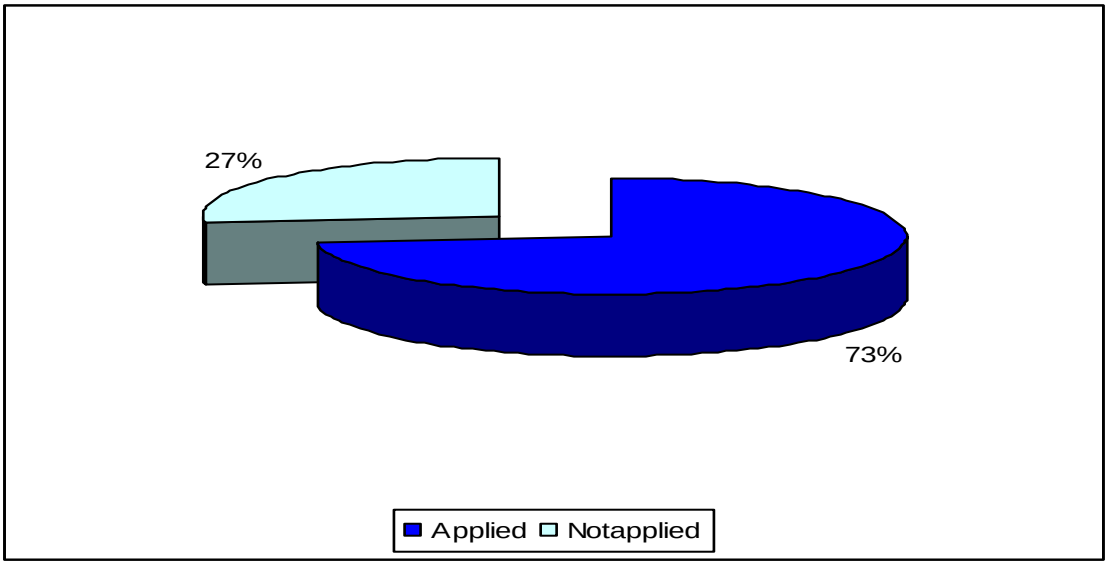

Figure 4.5: Adhere to wearing uniforms

This results congruent with (Shama, 2007) wearing gowns 72.5%, compliance of uniform from HCWs were (76%), (Manian, 2007), so sustainability and improvement is needed.

4.3.3 Hand washing:

Hand washing the most effective measure for preventing infections in the NICU and is an essential element of standard precautions (Siegel, 2007), however, the percent of applied hand washing 40.3%. hand washing items illustrate in the table (4.4).

Table 4.4: Adherence to hand washing

Variables	Applied%	Not Applied%
Hand washing immediately when arrival at work	16.4	83.6
Hand washing before touching newborns	40.3	59.7
Hand washing after touching newborns	71.6	28.4
Hand washing before leave work.	52.2	47.8
Hand washing before perform aseptic invasive procedure	44.8	55.2
Hand washing after touching blood or body fluid	83.6	16.4
Hand washing before wearing gloves	17.9	82.1
Hand washing after removing gloves	61	9
Removing jewelry hand watch and ring when washing hands	23.9	76.1
Washing hands for 15 to 30 seconds with soap and warm running water	59.7	40.3
Drying hand with clean paper towel	94	6
Turn off water after washing hand using paper towel	25.4	74.6

as shown the great deficiency in "washing hand immediately when arrival at work" 16.4% of HCWs, then " hand washing before wearing gloves" 17.9% , the best score it was 94% " Drying hand with clean paper towel" then" hand washing after touching blood or body fluid" 83.6% . Adherence to hand washing particularly in NICU the most important measure to prevent and control the spread of health care-associated

infections, as show from the table(4.4) that low adherence to hand washing consistent with universal results adherence of HCWs to recommended hand hygiene procedures has been poor, with mean baseline rates of 5%–81% (overall average (40%) (CDC,2002), non adherence was high with washing hands before dealing with patients 63.6%, but incongruent with(Hassan et al., 2004) wash their hands 87.55 ,while introduction of an education program rose compliance from 28% to 81% with performance feedback (Barbara,2004), so need education program and performance feedback.

4.3.4 Wearing gloves:

Gloves are used to prevent contamination of HCWs anticipating direct contact with blood or body fluids, mucous membranes, nonintact skin and other potentially infectious material. Having direct contact with patients who are infected with pathogens transmitted by the contact route, handling or touching visibly or potentially contaminated patient care equipment and environmental surfaces (Siegel et al., 2007). Adherence to wearing gloves just 31.3% of HCWs adhere to wearing gloves. Table (4.5) show in detail wearing gloves, great deficiency in " Wearing sterile gloves when dealing with Endotracial tube" have percent 29.9% and 77.6% of HCWs "Using clean gloves when handling contaminated instrument". While 38.8% of HCWs "Wearing surgical gloves in appropriate way when doing surgical invasive procedure" and 55.2 of HCWs wearing gloves when dealing with blood or other body fluids "this result indicate low adherence to wear gloves but better than (Askarian et al., 2002) result; gloves are worn only by 17.4% of personnel where wearing gloves between patients 77% (Shama et al 2007), only 22.8% of all touches of patient with cleaned and /or newly gloved (Cohen, 2003).

This results inconsistency with (Hesse, 2006) 88% of HCWs they wore gloves routinely when performing invasive procedures on patients, wearing gloves before education program 94% increased to 98.6%, (Hassan, et al, 2004). Therefore need for enhance practices of wearing gloves by in job training, education and regular monitoring.

Table 4.5: Adherence to wearing gloves

Variables	Applied %	Not Applied%
Wearing gloves when dealing with blood or other body fluids.	55.2	44.8
Wearing sterile gloves when dealing with Endotracial tube (ETT)	29.9	70.1
Wearing surgical gloves in appropriate way when doing surgical invasive procedure	38.8	61.2
Using clean gloves when handling contaminated instrument	77.6	22.4

4.3.5 Sharp disposal:

Needles and sharps injury are significant risk of blood borne infection in health care and major occupational health problem, needle stick or cut with a sharp object exposure that might place HCWs at risk for HB virus, or HIV infection (CDC, 2001).

About forty percent of HCWs applied the sharp disposal items and table (4.6) describe this items in detail, majority of HCWs 88.1 applied " Dispose of all sharps in puncture resistant container" then 73% for" Do not bend or break used needles prior to disposal" where 23.9"% of HCWs applied " Do not recapping used needles"

Table 4.6: Sharp disposal adherence items

Variables	Applied %	Not Applied %
Do not remove contaminated needles from syringes before disposal.	52.2	47.8
Do not bend or break used needles prior to disposal.	73.1	26.9
Do not recapping used needles.	23.9	76.1
Dispose of all sharps in puncture resistant container.	88.1	11.9

This result of low adherence to sharp disposal explain the reason for the high rate of exposure of used needle and sharp instrument 78% (as reported previously); that due to lack of commitment to guideline when dealing with sharp instrument and needles and adherence to instructions with sharp tools and unavailability of the organization to deal with sharp disposal (as will explain later).

These results are not congruent with other research (Askarian et al., 2002) found workers recapping of needles were reported by 66.2%, and hazards in needle stick 97% (Hassan et al, 2004). While 31.4% of participants had sustained at least one needle stick injury in the last 12 months, needle stick injuries could have been avoided by the introduction of safety devices, 29.2% might have been avoided needle stick injuries could have been prevented by organizational measures (Wicker et al, 2007). This point is importance to avoid needle stick injury and organization developing policy to prevent needles injury that might to cause blood borne infection to HCWs such (Hepatitis B virus) and aware of the risk of Human immunodeficiency virus (HIV) infection).

Table 4.7: Adherence to Antiseptic, disinfectant and Aseptic techniques

Variables	Applied %	Not Applied %
Sterile long-sleeved gown mask sterile gloves worn by all personal who have direct contact with sterile field during surgical and invasive procedures to the neonate.	11.9	88.1
Use antiseptic for hand washing prior aseptic invasive procedure (insertion central venous catheter, umbilical catheter) to newborn.	23.9	76.1
A sterile field is established and maintained during procedures until finished**.**	47.8	52.2
Clean skin for injection and insertion of peripheral intravenous catheter with 60%-90%Alcohol.	94	6
Leave antiseptic to dry for one minute after cleaning skin for insertion of peripheral intravenous catheter and injection.	47.8	52.2

As shown in table 4.7 the majority of HCWs 94% applied "Clean skin for injection and insertion of peripheral intravenous catheter with 60%-90% Alcohol" while 11.9% of HCWs applied "Sterile long-sleeved gown mask sterile gloves worn by all personal who have direct contact with sterile field during surgical and invasive procedures to the neonate "and 47.8% "maintained sterile field during procedures until finished". To summarize the adherence to IPC practices in the NICUs very low, that lead to increase risk of infection, adherence to recommended infection control practices decreases transmission of infectious agents in healthcare settings (Siegel et al., 2007). Therefore requires develop of specific polices and measures to improve adherence to IPC practices, comprehensive program of regular training and on jab training.

4.4 Adherence to IPC and organization factors (Assessment of physical environment in the NICUs):

Through the assessment of physical environment in NICUs in all hospitals found difference between hospitals in availability of physical environment as shown on the figure (4.6). The best score obtained for the European hospital, then Shadaa Alaqsa hospital, Khan-Younis Hospital, AL-Shifa Hospital, and the last Al-Nasser for children regarding the availability of the physical environment and adherence to IPC.

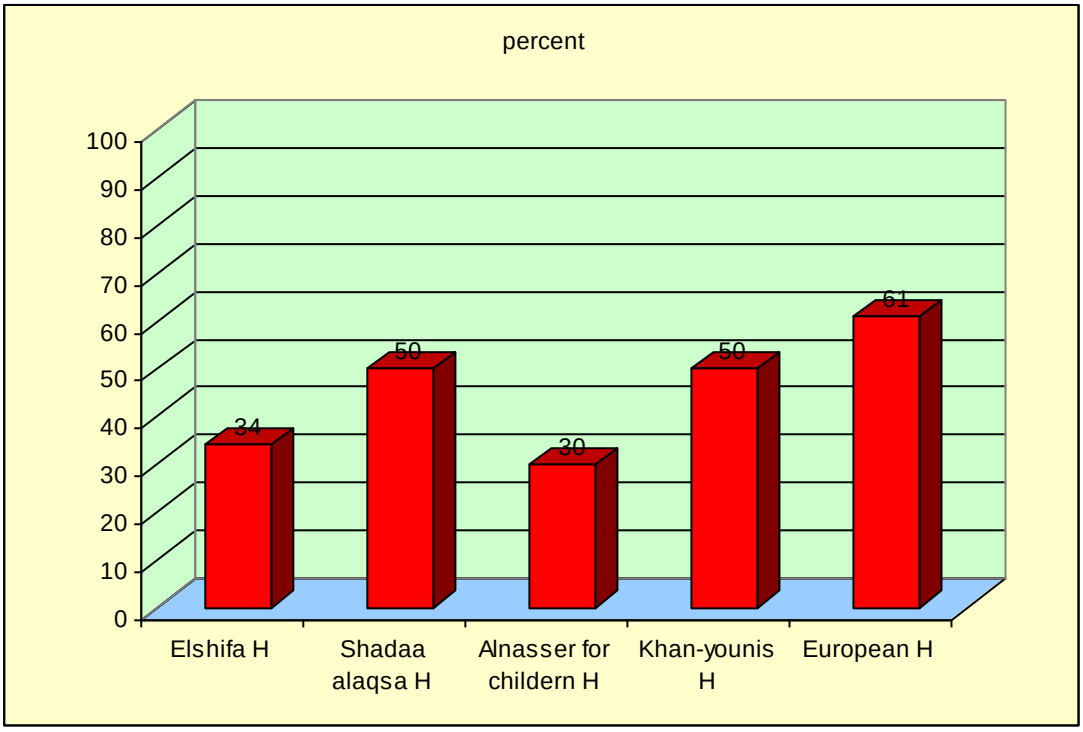

Figure 4.6: The percent of availability of physical environment

There were no any copies of IPC protocol in NICUs in all hospitals, it is the most important obstacles to the application of IPC protocol, and explain one of the reasons of low adherence, and the main defect, very low availability and low adherence in dealing with sharp disposal. This was evident of the increase rate 78% sharp instrument, as previously reported, no any unit dealing with waste safely.

There are clear shortage of disinfectant and antiseptic solutions in the majority of units especially Alcohol, disinfectant soap and chlorine solution 0.05%, low adherence in dealing with visitors in most of the units. Visitors did not adhere to recommended hand hygiene practices, deficit in maintain the cleaning of incubators in three units, most of units doing culture and sensitivity swabs except one unit.

Clear from the foregoing lack of the ability and availability of the organization for infection prevention and control its important for adherence to IPC (show tables in Annex 10), as (Pittet, 2002) confirmed factors affected adherence to hand hygiene easy access to hand hygiene supplies, whether sink, soap, medicated detergent, or waterless alcohol-based hand rub solution. Factors regarding the organization include lack of written guidelines, lack of appropriate hand hygiene agents; and lack of administrative leadership, sanctions, rewards, and support. Interventions to promote hand hygiene in hospitals should take into account variables at all these levels.

Health-care organizations should make available to their personnel a system that includes written protocols for prompt reporting, evaluation, counseling, treatment, and follow-up of occupational exposures that might place HCWs at risk for acquiring a blood borne infection (CDC, 2001). So required providing and maintain adequate supplies, resource and equipments.

4.5 Reasons for non adherence with IPC according to HCWs perception:

According to respondents' perception found the majority of respondents (86.4%) believed the IPC precautions not applied in the NICUs, for the following reasons are summary in the table (4.8)

Table 4.8: Causes of non adherence with ICP according to HCWs perception

Causes of non adherence with ICP according to HCWs perception	Percent%
No training program and updated information	82.5
Lack of knowledge and education	62.1
Time insufficient and high workload	59.2
Lack of supplies require	59.2
No accountability and feedback of performance from administration	54.4
Lack of guidelines from colleagues or superior	44.7
lack of job satisfaction	38.8
These precautions cause skin dryness and irritation	26.2
These precautions unnecessary in the NICU	1.9

The reasons for non adherence with IPC are not providing training program, updated information then lack of knowledge, and lack of supply and high workload have, then no performance feedback.

These results are congruent with a previous study, reasons reported by HCWs include skin irritation, inaccessible supplies, interference with worker-patient relation, patient needs perceived as priority, forgetfulness, ignorance of guidelines, insufficient time, high workload and understaffing lack of scientific information (Pittet, 2001) .So training program is important and increasing HCWs knowledge and availability of supply.

4.6 Infection prevention and control (IPC) Attitudes:

The researcher examined HCWs attitudes by selected variables summarized in table (4.9) ,the result showed positive attitude toward IPC that is evident through statistical analysis the mean attitude score was 4.4, percent 89%, and that evident from the table (4.9). Ninety-four of respondents indicated that infection prevention and control is

important for NICU, and 88% of respondents think that the effective infection prevention break the infectious disease transmission cycle. It was found that 95.8% of respondents confirmed washing hand is important to prevent infection in the NICU. While reported that 92.2% it's important to wash hands before leaving work. From the study respondent 89.6% agreed its important to wash hands when you arrive the unit, while 90.6% its important wearing gloves when contact with blood or body fluids , secretions and excretions, mucous membranes, draining wounds or non-intact skin, while 69.8% of respondent reported sterilizations in the unit done effect to prevent infection.

Table 4.9: Summary of HCWs attitudes toward IPC

Variables	Mean	Percent %
The infection prevention and Control is important for NICU	4.73	94
As you think the effective infection prevention break the infectious disease transmission cycle	4.41	88.2
Washing hand is important to prevent infection in the NICU	4.79	95.8
It is important to wash hands before you leave work	4.61	92.2
It is important to wash hands when you arrive the unit	4.48	89.6
It is important wearing gloves when contact with blood or body fluids , secretions and excretions, mucous membranes, draining wounds or non-intact skin	4.53	90.6
The unit do effective sterilizations in to prevent infection	3.49	69.8

That positive attitude toward IPC in the NCUs, high rate of the respondents agreed that universal precaution should be practiced for all patients. The respondents agreed that it is important to wear gloves when doing invasive procedures, consistent with literature; high awareness of the possibility of acquiring hepatitis B virus (HBV) and aware of the risk of Human immunodeficiency virus infection (Askarian et al, 2002),

96% of the respondents agreed that universal precaution should be practiced for all patients and 94% of the respondents agreed that it is important to wear gloves when doing invasive (Hesse, 2006). High awareness of infection control issues. (Crispian et al., 2007), so sustainability is needed

Next, the researcher assessed the association of attitudes score with practices of the IPC

4.7 Relationships between the IPC practices and attitudes:

There is a clear difference between attitudes and practices; the respondents have high rate of attitudes 89%, while low rate of practices 56%was found, figure (4.7); that mean the respondent have positive attitude, toward IPC but there's obstacles in implementation of IPC.

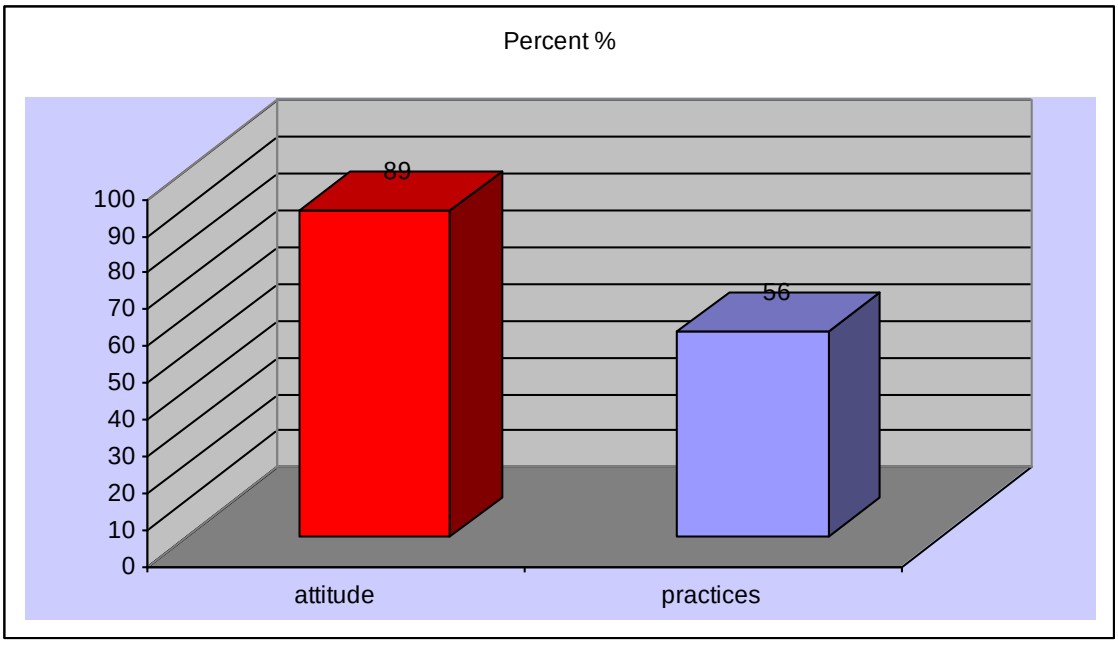

Figure 4. 7 Relation between attitudes and practices about IPC protocol

4.8 The relationship between attitudes and practices about infection control and prevention protocol in the NICUs and some variables:

The researcher examined the association between attitudes and practices of health workers in NICUs and some variables gender, year's of experience, type of profession, and the hospital to examine the relation of these factors on adherence to IPC protocol.

T test used to examine the relationship between IPC "practices and attitudes" and gender. As shown in the table (4.10) there is no statistical difference between means related to gender.

One Way ANOVA test used to examine relationship between the IPC "practices and attitudes " and (year's of experience, type of profession ,and hospital), according to the findings show in table(4.11) there no statistical difference was found between means in the all of independent variables (year's of experience, type of profession and hospital) and attitudes .

Table4 .10: Relationship between gender and IPC (practices and attitudes).

Variable		N	Mean	t	SD	df	P value
Attitudes	Male	64	4.44	.147	.42018	116	.230
	Female	54	4.43		.34229		
Practices	Male	64	2.92	1.223	0.5473	116	.499
	Female	54	2.80		.55876		

As show in the table (4.12) there was no statistical difference between (years of experience, type of profession) but their was statistical significant difference P-vale 0.006, between hospital and practices of IPC.

Table4:11 The Relationships between IPC attitudes and some variables

Variables	Items	No.	Mean	P value	F
Hospitals	Al-Shifa H	44	4.45	.316	1.198
	Kan-younis	17	4.53		
	AL-Nasser H	21	4.29		
	European H	26	4.53		
	Shahadaa Alaqsa H	10	4.43		
Experience	Less than 5 years	66	4.4	.642	.445
	6-15 years	39	4.4		
	Above 15 years	13	4.5		
Type of profession	Specialist physician	11	4.55	.350	1.121
	General physician	27	4.52		
	B.S nurse	45	4.40		
	Diploma 3yeare	17	4.44		
	Diploma 2yeare	18	4.43		

Table 4:12 the relationship between IPC practices and some variables.

Variables	Items	No.	Mean	P value	F
Hospitals	Al-Shifa H	44	2.73	.006*	3.861
	Kan-younis	17	2.93		
	AL-Nasser H	21	2.64		
	European H	26	3.11		
	Shahadaa Alaqsa H	10	3.15		
Experience	Less than 5 years	66	2.88	.690	.372
	6-15 years	39	2.87		
	Above 15 years	13	2.74		
Type of profession	Specialist physician	11	2.80	.40	1.019
	general physician	27	2.96		
	B.S nurse	45	2.85		
	Diploma 3yeare	17	2.67		
	Diploma 2yeare	18	2.99		

*statistically significant

Post Hoc test done to know where the real difference result illustrated in table 4:13

Table (4.13) Comparison between the hospitals regarding practices of IPC

Hospitals		Mean difference	P value	F
Eroupen Gaza hospital	AL-Shifa	.37675	.047*	3.861
	ALNasser H	.47253	.029*	
	kan-younis H	.17911	1.0	
	Shahadaa alaqsa H	-.04295	1.00	

*statistically significant

Table 4.13 presents the variations among the hospitals regarding practices of IPC findings demonstrate statistical difference between Eroupen Gaza hospital and (AL-Shifa hospital, ALNasser Hospital), while the differences not reach the statistical significance between Eroupen Gaza hospital and (Kan-Youns hospital ,and Shahdaa Alaqsa hospital) the difference better in Shahdaa Alaqsa .

These findings were inconsistent with the literature as the others found compliance varied with professional status. Nurses had better compliance with 66.4%, and physicians and technicians had compliance rates of 59, 1 % and 46, 7 % (Garcell et al., 2008).

Compliance with antiseptic hand rub use were statistically significant between the occupational groups (nurses had the highest compliance and physicians had middle compliance, Compliance in the 5 ICUs varied: in ICU A, there was 47% compliance ICU B, 39%; in ICU C, 36% in ICU D, 30%; and in ICU E, 47%, (Eckmanns et al., 2006); the researcher refer absence of differences could be due to small sample size.

4.9 Comparison between the two hospitals (European Gaza Hospital and Al-Shifa Hospital) regarding practices of IPC according to Observation:

T test was used to examine the relationship between the hospitals (European Gaza Hospital. and Al-Shifa Hospital.) and IPC practices. The results indicated there were statistical significant difference between the European Gaza Hospital and Al-Shifa Hospital. P-value 0.003 table (4.14).

Table 4.14: Comparison between the two hospitals regarding practices of IPC

Hospital	N	Mean	SD	df	t	P.value
European Hospital	25	15.28	3.325	65	3.125	.003
El-Shifa Hospital	42	12.57	3.493			

The differences were clear in hand-washing and wearing gloves.

Table 4.15: Comparison between the two hospitals regarding hand washing and wearing gloves

Variable	Hospital	N	Mean	SD	t	df	P.value
Hand-washing	European	25	.52	1.58	4.1	65	0.000
	El-Shifa	42	.19	2.051			
Wearing gloves	European	25	.68	.957	3.8	65	0.000
	El-Shifa	42	.24	.954			

As show in the table 4.14 and in table 4.15 statistical significant differences between the two hospitals regarding Hand-washing and wearing gloves were found. That the differences between the two hospitals were due to the Al-Shifa hospital more larger number of cases, older, more crowded units than NICU in European Hospital where European Hospital is a newer, and have more availability and facility for adherence according to an assessment the NICU physical environment indicated.

Chapter (5)

Conclusions and recommendations

I. Conclusions

Infection is major health problem causing morbidity and mortality among newborns infants, the present study provides the first data about adherence to infection prevention and control in Gaza governorates among health care workers. It is descriptive analytic cross sectional study aimed to assess the adherence to infection prevention and control protocols in the neonatal intensive care units in ministry of health hospitals in Gaza governorates; in order to enhance practices and prevent cross infection among neonatal infant to help in decreasing the infant mortality and morbidity in governorates. That included of all physicians and nurses who work in neonatal intensive care units they are 128 subjects, used for this purpose used three instruments for data collection: Self administered structure questionnaires, assessment structure check list of physical environment in the NICU and structured observation check list

The study results of high response rate were 92.2%. The finding of the study illustrate that 54 % males, 32% physicians of the study population, and 67% nurses, and most of 66% of respondents had below 15yeare experience. Most of respondents not have a copy (87.3%) of IPC, and most of them (73%) not have knowledge about the existence of Palestinian IPC protocol, only 47% of those who know have knowledge of the contents.

The study revealed 73% of HCWs have knowledge about the standard precautions of IPC, and most of HCWs received hepatitis B vaccination 85.6%; while 78% of respondent exposed sharp instrument injury.

The study also revealed that hospitals have lack of providing training of HCWs, just 28% of HCWs received training course about IPC, and low percent 29% providing continuous update information and instruction about IPC, and 88%of HCWs reported no system of performance feedback, and also revealed shortage of availability of many physical environment in NICUs, especially in the absence of copies of IPC protocol. Low adherence to dealing with disposal and waste, and sharp disposal, and it was the most hospital effectiveness in availability of physical environment that for NICU in European Gaza Hospital.

The study clarified that the practices of IPC is very low with 56%, while high percent 89% with attitudes. The study showed through direct observation very low adherence to hand washing 40%, wearing gloves 31.3 % of HCWs, and dealing with sharp disposal 40%.

The most important reasons of nonadherence to IPC according to the health care workers opinion the absence of a training program, and lack of knowledge and education, time insufficient and high workload, lack of supplies require.

The study showed there were statistically significant differences between practices and the hospitals, and no statistically significant differences between practices and (year's of experience, type of profession, and gender). Also, no statistical significant differences between attitudes and (year's of experience, type of profession, hospitals and gender).

To conclude, the study revealed that HCWs and neonates infant in our hospitals are at risk to acquire nosocomial infections because of non-adherence of HCWs to infection

prevention and control due to several reasons: lack of training, lack of knowledge about IPC protocols lack of some supply and equipments.

II. Recommendations

The findings of this study lead the researcher to develop some recommendations that may help policy makers to control the problem.

These recommendations need to be achieved mutual cooperation between the organization and health care workers .The recommendations suggested by the researcher are:

- Creating National Infection prevention and control program include infection control committee and infection control team to support hospitals in reducing the risk of infections.
- Developing comprehensive program of regular training, and training as part of on-the-job, to include all HCWs in NICUs.
- Developing specific policies and measures to improve adherence of infection prevention and control and in the NICUs.
- Providing and maintaining adequate supplies, resources, and equipments which are necessary for adherence to infection control and to maintain effective infection control.
- Protecting of health care workers, by providing vaccine against hepatitis-B virus for all health care workers reduces the risk of hepatitis-B infection.
- Familiarizing the health care workers about the existence of the Palestine infection prevention and control protocol as well as contents of the protocol and training of health care workers on protocol within the training program.
- Providing infection prevention and control and protocol copies in the NICUs.
- Conducting evaluation and performance feedback system of infection prevention and control.

- Including Infection prevention and control program as part of orientation program for all staff before working in the NICUs.

Research recommendations

- Further observational studies should be conduct about adherence to standard Universal Precautions, hand washing, management of waste and sharp disposal.
- Further studies to include other health providers and cleaners
- More studies about infection prevention and control in others departments and units especially in maternity departments.
- Conducting observation studies as part of performance evaluation to provide to sustain feedback HCWs.

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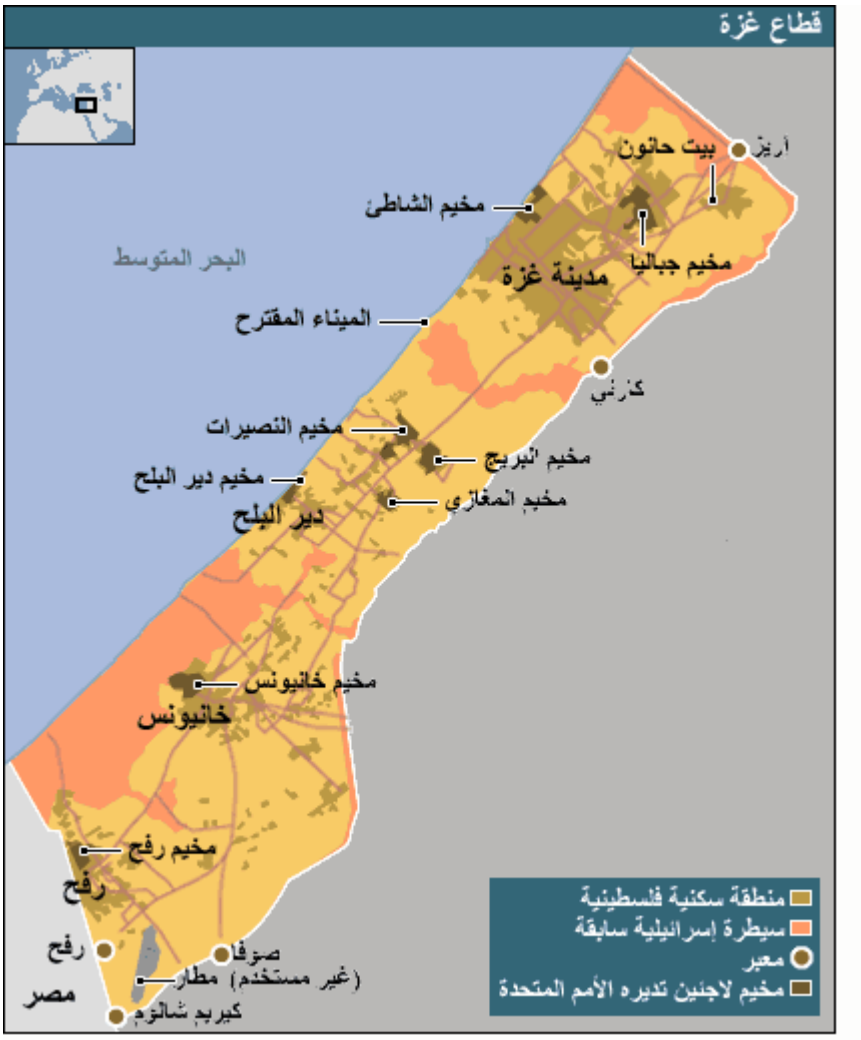
Annexes

Annex 1
Map of Palestine

Source: MOH, 2000

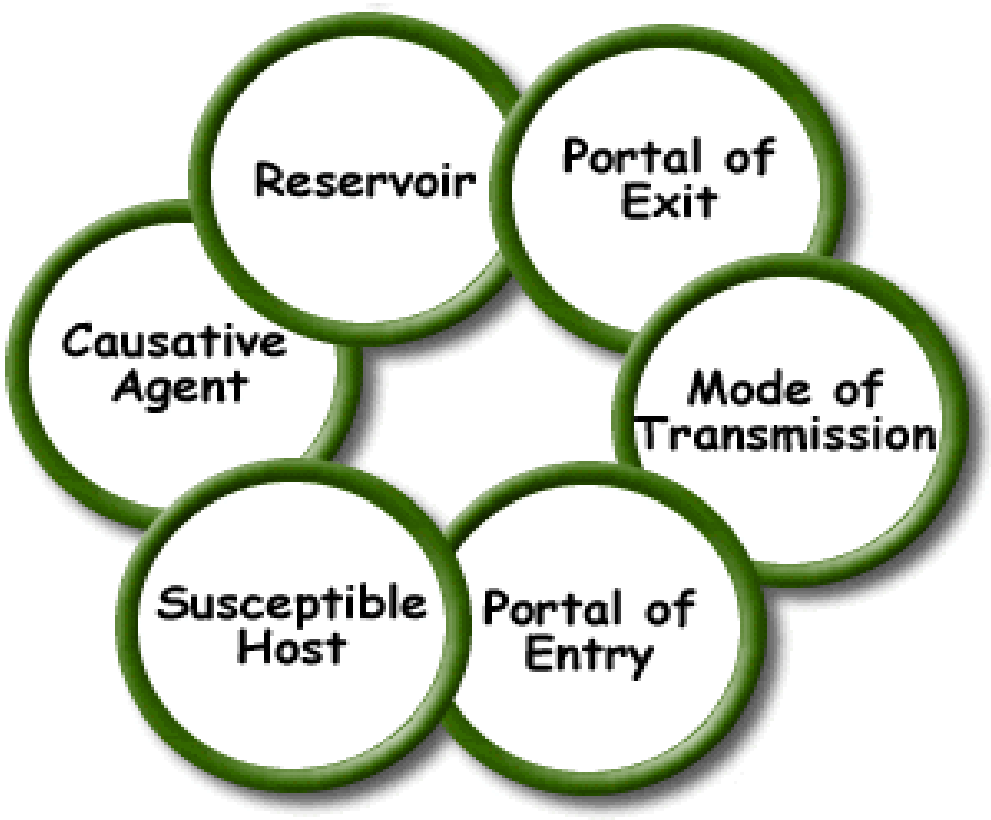
Annex 2
Map of Gaza strip



Source :BBC Arabic
http://news.bbc.co.uk/hi/arabic/middle_east_news/newsid_5125000/5125266.stm

Annex 3

Infection chain



http://www.austincc.edu/adnmob/rnsg1140/asepsis/chain.htm

Annex 4

Questionnaire

Consent form

AL Quads University
School of Public Health

Dear participant

You are selected as participant in the research " Adherence to Infection Prevention and Control Protocols in the Neonatal Intensive Care Units in the Ministry of Health Hospitals in Gaza Governorates

, this study self funded is part of the requirements of the master degree of public health AL-Quads University –Palestine.

You are selected because you met the criteria for participation. The aim of this study to evaluate the infection prevention and control in NICUs in governmental hospital in Gaza strip; which might help to reduced the infection in NICU in Gaza strip.

The time required self administered questionnaire not excess fifteen (15) minutes
There's no any risk or discomfort as result of your participation , and all information will used for the purpose of scientific research ,and will be kept confidential and anonymity will maintained , and you have the freedom to withdrawal from participation at any time.
Please answer all the questions as your opinion appropriate as there are no correct answers and wrong answers, and I will be located in the place during the data collection and ready for any question

Thank you for your participation It's very effective
Researcher:
Nisren H. awad

Questionnaire

Ser No …….

❖ **Personal and professional information**

Please answer these questions:

1) Gender male …… female ……

2) Hospital ……**…**

3) Type of work:

Physician specialist ……. general …….

Nurse: BS Diploma Below diploma

4) Year's of experience in NICU ……

5) Do you have a copy of infection control and prevention protocol?

Yes …….. No……..

6) Do you have any access for infection prevention and control protocol?

7) If yes where it's located:

Hospital …… , library ……., unite ……..,

❖ **Assessment of infection Prevention and Control:**

8) Do you know about the (universal) standard precautions of infection prevention and control?

Yes ……. No …….

9) Do you know is there a Palestine infection prevention and control protocol?

Yes……. No……

If **yes;** answer (Q10, 11)

10) Do you know content the of the protocol?

Yes ……, NO ……..

11) It's applied in NICU?

Yes ……. No……

12) Have you received any infection prevention and control training course?

Yes ……. No ……

13) Did the hospital provide continuous update information and instruction about infection control and prevention?

Yes …….. No…….

14) Do you feel that you need to learn more about infection prevention and control?

Yes …… No……

15) Have you ever been vaccinated for hepatitis B?

Yes …….. No …….

16) Are you exposed to use needle or Sharpe instrument injury?

Yes ……., No ……

17) Is there a system of punishment and reward for the infection prevention and control in the unite?

Yes …… No ……

18) Do you think the health care worker in the NICU applied the infection prevention and control precautions?

Yes ……. No……

19) If **(NO**), Do you think that's related to (**you can choose *or more than one* of the following statement**) by placing a check mark(√)

a. Lack of knowledge and education ( )

b. No training program and update information ( )

c. Time insufficient and high workload ( )

d. Lack of Supplies require ( )

e. Lake of guidelines from colleagues or superior ( )

f. These precautions cause skin dryness and irritation ( )

g. No accountability and feedback of performance from administration ( )

h. These precautions unnecessary in the NICU ( )

i. lack of job satisfaction ( )

❖ **Please record the level of your agreement or disagreement with each of the following statements by placing a check mark (√) in the appropriate box**.:

(1), strongly disagree, (2) disagree, (3) undecided, (4) agree, (5) strongly agree

NO	Items	strongly disagree	disagree	undecided,	agree	Strongly agree
22)	The infection prevention and control is important for NICU					
23)	As you think the Effective infection prevention breaks the infectious disease transmission cycle					
24)	All health care workers washing hands when arriving at work					
25)	All health care workers wash hands before touching the newborns					
26)	All health care workers wash hands after touching the newborns					
27)	Are all health care worker abiding to wearing the NICU uniforms					
28)	Health care workers wash hand after contact with blood, body fluids, secretions and excretions and exudates from wounds.					
29)	Health care worker removing jewelry					

NO	Items	strongly disagree	disagree	undecided,	agree	Strongly agree
	hand watch and ring when washing hands					
30)	Washing hand its important to prevent infection in the NICU					
31)	It's important to wash hands before you leave work.					
32)	Its important to wash hands when you arrive the unit					
33)	Wearing gloves when contact with blood or body fluids , secretions and excretions, mucous membranes, draining wounds or non-intact skin					
34)	Wearing clean gloves when handling contaminated instrument					
35)	Use sterilized equipment and sterile procedure for wound dressing and invasive procedure					
36)	The health care worker don't recapping the contaminated needle break or bend before disposal					
37)	The health care worker don't remove used needles from syringes before disposal					
38)	Infants who remain in the nursery for an extended period transferred periodically to a different, disinfected unit so that the originally occupied unit can be cleaned					
39)	Place unclean equipment immediate after use in 0 .5% chlorine					
40)	○○○Prevent any visitor with symptoms of Influenza, fever, upper respiratory					

NO	Items	strongly disagree	disagree	undecided,	agree	Strongly agree
	tract infection or other infectious is not allowed to visit					
41)	Sterilizations in the unit done effect to prevent infection					

Annex 5

استبانه

بسم الله الرحمن الرحيم

جامعة القدس

كلية الصحة العامة

عزيزي المشارك:

يسعدني مشاركتك الفعالة في بحث بعنوان " الالتزام ببروتوكولات منع والوقاية من العدوى في أقسام العناية المركزة لحديثي الولادة في محافظات غزة " ، وهذه الدراسة ممولة ذاتيا ,وه ي جزء من متطلبات نيل درجة ماجستير الصحة العامة بجامعة القد س أبو ديس - فلسطين.

ولقد تم اختيارك لانطباق معايير المشاركة عليك, و تهدف هذه الدراسة لدراسة الالتزام بمنع والوقاية بالعدوى في أقسام العناية المركزة لحديثي الولادة في المستشفيات التابعة لوزارة الصحة في محافظات غزة

، والتي يمكن أن تساعد على خفض الإصابة بالعدوى في محافظات غزة.

الوقت اللازم لتعبئة الاستبيان لا تتجاوز خمسة عشر (15) دقيقة

لا يوجد أي احتمال للخطر أو عدم الراحة نتيجة لمشاركتكم ، وجميع المعلومات سوف تستخدم لأغراض البحث العلمي ، وستكون سرية تماما و لا داعي لكتابة الاسم , لك الحق بوفض المشاركة ، وكما لديك الحرية في الانسحاب من المشاركة في أي وقت

يرجي الإجابة علي جميع الأسئلة وفق ماتراه مناسب حيث لا يوجد إجابة صحيحة و إجابة خاطئة , وسوف أكون متواجدة في المكان خلال جمع البيانات وجاهزة لأي استفسار

أشكركم على مشاركتك والتي ستكون فعالة للغاية .

مع فائق الاحترام والتقدير

الباحثة : نسرين عوض

استبانه

رقم مسلسل .....

المستشفي :

---

1. معلومات شخصية ومهنية:

من فضلك اجب عن الأسئلة التالية :

1. الجنس: ذكر..... أنثي .....

2. المستشفي.....

3. المهنة:

طبيب :أخصائي ..... عام .....

تمريض:بكالوريوس..... دبلوم(3سنوات) ..... دبلوم (سنتان).....

4. سنوات الخبرة بالعمل العناية المركزة لحديثي الولادة (الحضانة).....

5. هل لديك نسخة من برتوكول المكافحة والوقاية من العدوى؟ نعم ..... لا.....

6. هل لديكم وسيلة للوصول لبرتوكول المكافحة والوقاية من العدوى؟ نعم..... لا.....

7. أذا نعم من أين ؟ المستشفي ..... المكتبة..... القسم ..... ، الانترنت .....

❖ تقيم منع و مكافحة العدوى:

8. هل تعرف عن الاحتياطات المعيارية(العالمية) لمنع ومكافحة العدوى ؟

نعم ..... لا .....

9. هل تعرف بوجود برتوكول فلسطيني لمنع ومكافحة العدوى ؟ نعم ..... لا .....

أذا (نعم) أجب عن سؤال (س 10 وس11)

10. هل تعرف مضمونه ومحتوياته ؟ نعم ..... لا .....

11. هل هو مطبق بالقسم ؟ نعم ..... لا .....

12. هل تلقيت أي دورات تدريبية حول منع و مكافحة العدوى؟ نعم ..... لا .....

13. هل تقدم لكم المستشفي معلومات وتعليمات حديثة ومستمرة حول منع و مكافحة العدوى والوقاية ؟

نعم ..... لا .....

14. هل تشعر انك بحاجة لتتعلم المزيد حول منع و مكافحة العدوى ؟ نعم ..... لا.....

15. هل سبق وأخذت تطعيم التهاب الكبد الوبائي ب ؟ نعم ..... لا .....

16. هل سبق وتعرضت لوخز ابر و أدوات حادة مستخدمة؟ نعم ..... لا .....

17. هل هناك نظام للمكافأة والعقاب لمنع ومكافحة العدوى بالقسم ؟ نعم ..... لا .....

18. هل تعتقد أن جميع العاملين بالقسم يطبقون احتياطات منع و مكافحة العدوى ؟

نعم ..... لا ..... لا أعرف .....

إ ذا كانت *الإجابة لا* باعتقادك ذلك يعود إلي ***(يمكنك اختيار أكثر من واحد من العبارات التالية)*** من خلال وضع علامة اختيار (√)

أ - عدم معرفة و عدم علم باحتياطات الوقاية من العدوى ( )
ب - عدم وجود برنامج تدريب وتحديث المعلومات ( )
ت - الوقت غير كاف وارتفاع عبء العمل ( )
ث - نقص المستلزمات المطلوبة ( )
ج - عدم وجود توجيه من الزملاء أو من الإدارة العليا ( )
ح - هذه الاحتياطات تسبب جفاف وتهيج الجلد ( )
خ - عدم وجود المساءلة و المراجعة من الإدارة ( )
د - هذه الاحتياطات لا داعي لها في القسم ( )
ذ - عدم الرضا عن العمل ( )

❖ **من فضلك تسجيل مستوي اتفاقك واختلافك مع العبارات التالية بوضع علامة (√)في الخانة المناسبة :**

الرقم	العبارات	أعارض بشدة	أعارض	محايد	أوافق	أوافق بشدة
22.	منع ومكافحة لعدوى مهم لقسم الحضانة					
23.	حسب اعتقادك التحكم الفعال بالعدوى يقطع دورة انتقال العدوى بالأمراض المعدية					
24.	جميع العاملين بالقسم يقومون بغسل أيديهم فور الوصول للعمل					
25.	جميع العاملين بالقسم يقومون بغسل أيديهم قبل لمس المواليد					
26.	جميع العاملين بالقسم يقيمون بغسل أيديهم بعد لمس المواليد					
27.	يلتزم جميع العاملين بلبس الزى الخاص عند الدخول للقسم					
28.	يلتزم جميع بلبس مريول ذو أكمام طويلة وقناع وقفازات ,يرتديها					

الرقم	العبارات	أعارض بشدة	أعارض	محايد	أوافق	أوافق بشدة
	كل شخص يتصل اتصال مباشر مع الأدوات المعقمة خلال الإجراءات الجراحية					
.29	يقوم العاملين بنزع ساعة اليد, مجوهرات, الخاتم من اليد قبل غسلها					
.30	من الضروري غسيل اليدين لمنع العدوى بالقسم					
.31	من الضروري غسل اليدين قبل مغادرة العمل					
.32	من الضروري غسل اليدين فور الوصول للقسم					
.33	ارتداء القفازات عند التعامل مع الدم أو سوائل الجسم ، والإفرازات ، و الأغشية المخاطية ، و الجروح المفتوحة والجلد المفتوح					
.34	ارتداء القفازات عند التعامل مع الأدوات الملوثة					
.35	استخدام المعدات والأدوات المعقمة الإجراءات المعقمة لتضميد والغيار علي الجرح و الإجراءات الجراحية					
.36	لا يقوم العاملون بإعادة إغلاق, كسر, أو ثني الإبر المستخدمة قبل رميها					
.37	لا يقوم العاملون بإزالة الإبر من الحقن قبل التخلص منها					
.38	المواليد للذين يبقون بالقسم لفترة طويلة يتم نقلهم بشكل دوري لحاضن أخر ويتم تطهير الحاضن الأصلي					
.39	يتم وضع الأدوات الملوثة فور استخدامها بمحلول كلور 5%					
.40	يمنع أي زائر يظهر عليه أعراض الأنفلونزا, الحمى , التهاب المسالك التنفسية العليا					
.41	التعقيم بالقسم يتم بطريقة فعالة للوقاية من العدوى					

شكرا لمساهمتك

الباحثة : نسرين عوض

Annex 6

Assessment Check list of the NICU

Serial no ……. **Hospital (……..)**

Assessment Check list of the NICU in hospital …….

No	Items	applied	Not applied
1.	Is there a copy's of the IC&P Protocol in the NICU		
2.	Alcohol swabs are available in all rooms		
3.	Incubators and area around clean, no blood , dust ,milk or other dirty		
4.	Incubators disinfected after discharge		
5.	Soak all instrument immediately after use in a 5% chlorine solution for 10 minutes		
6.	There is at least 1 hands-free hand washing sink for 4 beds in the NICU		
7.	All supplies (water source, a sink, soap bars or liquid soap, tissue paper)for washing hands are available		
8.	Is their antiseptics soaps fore hand washing		
9.	Clean instrument with soft brush in soapy water, rinse instrument with water.		
10.	Equipment and supplies shared between infants Inside and out side of the incubators immediately after used.		
11.	Is there sharp disposal container in every room		
12.	Dispose sharp disposal container when 3/4 full		
13.	Wash all waste container with disinfectant (.05% chlorine solution)and rinse with water		
14.	Use non corrosive washable container(plastic or galvanized metal) with cover for contaminated wastes		
15.	Waste disposal not' contain sharp items or fluids.		
16.	Labeling and separating of waste disposal		
17.	Person handling waste wear heavy gloves		

No	Items	applied	Not applied
18.	Is there a sufficient number of clean gown in the unity for visitors		
19.	All visitor wear clean gown when entering the unite		
20.	All visitors washing hand before entering the unite		
21.	Is the antiseptics and disinfectants solution available in the unit		
22.	Are all health care worker abiding to wearing the NICU uniforms		
23.	General cleaning in waiting room , kitchen , and others area		
24.	Place unclean equipment immediate after use in 0 .5% chlorine		
25.	clean suction tube and suction container		

Annex 7

Observation checklist for health care workers in the Neonatal Intensive Care Units

Serial No……

Observation checklist

NO	Items	Applied	Not applied
1.	**Uniform** wearing the NICU uniforms when entering the unite		
2.	**Hand washing** Hand washing immediately when arrival at work		
3.	Hand washing before touching newborns		
4.	Hand washing after touching newborns		
5.	Hand washing before leave work.		
6.	Hand washing before perform aseptic invasive procedure		
7.	Hand washing after touching blood or body fluid		
8.	Hand washing before wearing gloves		
9.	Hand washing after removing gloves		
10.	Removing jewelry hand watch and ring when washing hands		

11.	Washing hands for 15 to 30 seconds with soap and warm running water		
12.	Drying hand with clean paper towel		
13.	Turn off water after washing hand using paper towel		
14.	**Wearing Gloves** Wearing gloves when dealing with blood or other body fluids.		
15.	Using clean gloves when handling contaminated instrument		
16.	Wearing sterile gloves when dealing with endotracial tube (ETT)		
17.	Wearing surgical gloves in appropriate way when doing surgical invasive procedure		
18.	**Antiseptic and disinfectant** Sterile long-sleeved gown mask sterile gloves worn by all personal who have direct contact with sterile field during surgical and invasive procedures to the neonate		
19.	Use antiseptic for hand washing prior aseptic invasive procedure(insertion central venous catheter , umbilical catheter) to newborn		
20.	A sterile field is established and maintained during procedures until finished		
21.	Clean skin for injection and insertion of peripheral intravenous catheter with 60%-90%Alchol		
22.	Leave antiseptic to dry for one minute after cleaning skin for insertion of peripheral intravenous catheter and injection		
23.	Do not remove contaminated needles from syringes before disposal**,**		
24.	**Sharp disposal** Do not bend or break used needles prior to disposal		
25.	Do not recapping used needles		
26.	Dispose of all sharps in puncture resistant container		

Annex 8

Helsinki Approval

Palestinian National Authority
Ministry of Health
Helsinki Committee

السلطة الوطنية الفلسطينية
وزارة الصحة
لجنة هلسنكي

Date: 15/8/2008

التاريخ: ٢٠٠٨/٨/١٥

Name: Nisren Awad

الاسم: نسرين عوض

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

نفيدكم علماً بأن اللجنة قد ناقشت مقترح دراستكم حول:-

Adherence to infection prevention and control protocols ia the neonatal intensive care units in the ministry of health hospitals in Gaza Governorates.

In its meeting on August 2008
and decided the Following:-
To approve the above mention research study.

و ذلك في جلستها المنعقدة لشهر أغسطس ٢٠٠٨
و قد قررت ما يلي:-
الموافقة على البحث المذكور عاليه.

Signature
توقيع

Member
عضو

Member
عضو

Chairperson

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.

Gaza Etwam – Telefax 972-7-2878166

Annex 9

MOH Approval

Al-Quds University
Jerusalem
School of Public Health

جامعة القدس
القدس
كلية الصحة العامة

30/6/2008

المحترم حضرة السيد مدير عام المستشفيات – بوزارة الصحة

تحية طيبة وبعد،،،

الموضوع: مساعدة الطالبة نسرين عوض

تقوم الطالبة المذكورة أعلاه بإجراء بحث بعنوان:

"Adherence to Infection Prevention and Control Protocols in the Neonatal Intensive Care Units in the Ministry of Health Hospitals in Gaza Governorates"

كمتطلب للحصول على درجة الماجستير في الصحة العامة-مسار إدارة صحية حيث تم اختيار كل من المستشفيات (الشفاء، الأوروبي، الأقصى، خانيونس، و النصر) ضمن عينة البحث المدروسة و عليه نرجو التكرم للإيعاز لمن ترونه مناسب لتسهيل مهمة الطالبة في جمع البيانات اللازمة 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
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ص.ب/51000-القدس

Annex 10

Tables: Distribution of the physical environment in the NICUs:

Table1: Availability of supplies

Items	No of unit applied
There is at least 1 hands-free hand washing sink for 4 beds in the NICU	4
All supplies (water source, a sink, soap bars or liquid soap, tissue paper)for washing hands are available	3
Is their antiseptics soaps fore hand washing	2
Clean instrument with soft brush in soapy water, rinse instrument with water.	0
Is the antiseptics and disinfectants solution available in the unit	4

Table2: disinfectant

Items	No of unit applied
Alcohol swabs are available in all rooms	4
Place unclean equipment immediate after use in 5% chlorine	2
Incubators and area around clean, no blood , dust ,milk or other dirty	2
Incubators disinfected after discharge	5
Soak all instrument immediately after use in a 5% chlorine solution for 10 minutes	2

Table3: dealing with visitor

Items	No of unit applied
All visitor wear clean gown when entering the unite	1
All visitors washing hand before entering the unite	2

Table4: disposal and waste

Items	No of unit applied
Is there sharp disposal container in every room	0
Is there a sufficient number of clean gown in the unity for visitors	3
Dispose sharp disposal container when 3/4 full	0
Wash all waste container with disinfectant (5% chlorine solution)and rinse with water	0
Use non corrosive washable container(plastic or galvanized metal) with cover for contaminated wastes	0
Waste disposal not' contain sharp items or fluids	0
Labeling and separating of waste disposal	0
Person handling waste wear heavy gloves	2

Annex 11

Age pyramid for Palestinian population, 2006