

CHAPTER ONE

INTRODUCTION

Back ground to the study

Infections are caused by micro organisms which resides anywhere living things are. In human beings, when they infect people, it leads to infections or diseases leading people to seek for health care services for treatment against such diseases. This call for infection prevention and control on the part of the health workers so that patients will not acquire new infections on admission and the health workers themselves will not be infected while discharging their duties. Health care providers are prone to infections due to the nature of services they provide to people and during the course of providing these services, many had been infected with one infection or the other known as healthcare associated infections (HAIs). This lead to morbidity and mortality in the course of caring for people with illness and infections and this infections can spread if proper asepsis (infection control) is not maintained and established. It is of utmost importance that healthcare workers take necessary precaution to ensure that they are not exposed to infectious agents while discharging their duties.

Trampuz and Widmer (2004) were of the opinion that health care associated infections due to poor hand hygiene had been linked to an unacceptably high level of morbidity, mortality and health care cost. This makes HAIs the most common complications affecting patients in hospital. However, the problem does not just affect patients and workers in the hospitals, HAIs can occur in any health care setting, including office based practices (e.g. general practices, clinics and dental clinics) and long term health care facilities (National Health and Medical Research Council (NHMRC), 2010). Health care associated infections (HAIs) is a potentially preventable rather than an unpredictable complications, prevention of this infections has a major positive impact on the total in-hospital morbidity and mortality, as well as the economy of the hospital and the nation as a whole.

During the delivery of health care, patients can be exposed to a variety of exogenous micro organisms (bacteria, viruses, fungi and protozoa) from the patients, health care personnel or visitors, other reservoirs includes the patients endogenous flora (e.g.

residual bacteria residing on the patients skin, mucous membrane, gastro intestinal tract, or respiratory tract) which may be difficult to reduce and inanimate environmental surface or object that have become contaminated (e.g. patient room, touch surfaces equipment, medication). The most common sources of infectious agents causing HAIs, describe in a scientific review of 1022 outbreak investigations by are listed herein in decreasing frequency; the individual patient, medical equipment or devices, hospital environment, the health care personnel, contaminated drugs, contaminated food and contaminated patients care equipment (Gastmeier, stamm-Balderjahn., Hansen, Nitzschke-Tiemann, Zuschneid, Groneberg, Ruden, 2005).

Health care workers (HCWs) are on the frontline defense for applying daily infection control practices to prevent infections and transmission of organisms to other patients and to themselves. It is essential that health care organizations and health care workers understand and address the real risk patient pose to them and they pose to their patients. Health workers need to know what asepsis is, how to establish and maintain it as poor knowledge and use of the term "sterile" aseptic and non sterile aseptic. These have contributed to poor understanding of what aseptic technique is all about thereby making many healthcare workers to be susceptible to pathogens and microorganism of many diseases including tuberculosis and hepatitis B virus (HBV). A study by Ola, Odaibo, Olaleye and Ayoola, (2012), among health workers in Nigeria, found out that the prevalence of HBV infection was 65.9%, where HBV infection was similar in all the different occupation groups of HCWs (44.50%) except among gynecologist and obstetricians with 80%, the rate was higher among HCWs than non HCWs.

Another infection that can be acquired by healthcare worker is Lassa fever infection in humans which typically occurs by exposure to animal excrement through the respiratory or gastrointestinal tracts, inhalation of tiny particles of infective material (aerosol). This is believed to be the most significant means of exposure. It is possible that a patient must have acquired the infection through broken skin or mucous membrane that is directly exposed to the infective material which healthcare workers may also acquire during care for the patient. Clinically Lassa fever is difficult to distinguish from other viral hemorrhagic fever such as Ebola and Marburg and from

common febrile illnesses such as malaria, and this place health workers at a receiving end, if proper infection control measure is not followed, they can be infected. In a study reported in Taraba State by Gesto et.al, (2012), a total of 35 cases of Lassa fever were reported, nine of 35 cases were laboratory confirmed (25.7%). Altogether 14 deaths were recorded, most of the cases were healthcare workers (22.90%) and the commonest features were fever, cough, bleeding from orifices.

The outbreak affected mostly healthcare workers that might be ignorant of the diagnosis and due to lack of proper infection control measures. Severe Acute Respiratory Syndrome (SARS) is a rapidly spreading, potentially fatal infectious viral disease. It was recognized as a global threat in March 2003, the viral disease first appeared in Southern China in November 2002 and spread to more than 24 countries in Asia, Europe, North America and South America and by spring of 2004, and the outbreak appeared to be over, (Center for Disease prevention and Control, (CDC) 2004). But not after it had claimed with its victim the lives of many doctors, nurses, pharmacist, paramedics because the virus had a highly unusual pattern of transmission. Its peak of infectivity occurred late in the course when they are at their most unwell state and usually in the hospital, (Nursing World Nigeria (NWN), 2013).

In 2014, West Africa experienced the largest Ebola virus disease (Ebola) epidemic in recorded history and health care workers (HCWs) were at much risk for Ebola because of the nature of their work. European Center for Disease Prevention and Control (ECDC) 2015 reported that since the outbreak of Ebola in 2014 in Liberia, as of August 14, 2014, a total of 810 cases of Ebola had been reported, including 10 clusters of Ebola cases among HCWs working in facilities that were non Ebola Treatment Units (non-ETUs). The Liberian Ministry of Health and Social Welfare and CDC investigated these clusters by reviewing surveillance data, interviewing county health officials, HCWs, and contact tracers, and visiting health care facilities. Ninety-seven cases of Ebola (12% of the estimated total) were identified among HCWs; 62 HCW cases (64%) were part of 10 distinct clusters in non-ETU health care facilities, primarily hospitals. This shows that the health workers who are not at Ebola treatments Units were not making use of aseptic technique and standard precautions as expected thinking they were safe but invariably were infected by the disease from patients they were taking care of. In Nigeria 20 people were

infected by Ebola Viral Disease (EVD) out of which 11 were health workers and 5 of them died due to the infection, in Sierra Leone, 305 health care workers were infected with EVD and 221 died, likewise in Guinea 189 health care workers were infected with 94 dead (ECDC, 2015), all this happen because health care workers were not always at alert in using proper aseptic technique while attending to patients who may be infected and health care worker are not aware.

In health education, concepts of cognition, attitude and behaviour about health issues are important. One may acquire facts, information, skill and understanding about health issues through classroom interaction, training or experience of life. Attitude is one's feeling, disposition to objects and processes that attracts one's attention. How one does a thing based on one's knowledge and or attitude is knowledge or cognition and this is manifested in one's actions and behavior, knowledge most times influences one's attitude and behavior. Cognition, attitude and behavior are also individually determined also by various demographic characteristics, psychological and structural variables of an individual. The level of cognition, attitude and work related risk reduction practices among health workers to aseptic technique are generally low (WHO, 2009). Studies done to assess the cognition, attitudes, compliance, and reasons for non adherence to hand hygiene guidelines, aseptic technique precautions have found that compliance by health care workers is poor (Kennedy, Elward and Fraser, 2004; Kennedy and Burnett, 2011), and may be due to several factors like being overworked, having exposed skin and negligence. Creedon, (2008) found out that health care workers compliance to aseptic technique was found out to be worst before high risk procedures as some health workers substitute wearing of gloves alone without combining hand hygiene practices. Adebimpe, Asekun, Bamidele, Abodunrin and Olowu (2011) also reported good cognition and attitude but poor practices of aseptic technique to prevent HAIs among tertiary and secondary level health workers in Osogbo. According to them provision of information about HAIs influence knowledge and behaviour since health care workers (HCWs) would be able to answer correctly and use appropriately, HAIs control measures (aseptic technique) if they had received information from educational courses and scientific journals. Suchitra and Lakshmi (2007) reported that education session for health workers was found to

improve cognition and attitude scores of health workers towards hospital acquired infections.

Gammon and Morgen (2007), found that HAIs has been linked to unacceptably high level of morbidity, mortality world wide. Previous studies have shown that work related risk reduction practices like hand hygiene, decontamination, sterilization and aseptic compliance among health care worker is generally low (WHO, 2009). Joshi, Reingold, Menzies and Pai, (2006) in a systematic review of tuberculosis (TB) prevalence in low and middle income countries found that the annual incidence of TB among HCWs ranged from 69 to 5,780 per 100,000 and the attributable risk for TB disease in HCWs compared to the risk in the general population ranged 25 to 5,361 per 100,000 per year. Certain work location like in-patient TB facility, laboratory, internal medicine and emergency facilities are at higher risk of acquiring TB disease. Studies reinforce the need to design and implement simple, effective and affordable TB Infection control programme in health care facilities, more especially in low and middleincome countries like Nigeria. Empirical studies (Karani, Katsivo, Muhami, Lwafama and Ntsekhe, 1990; Ward, 2012; Aida, Pierluigi, Carmelo, Claudia and Maria , 2013) however showed that health workers have high cognition, positive attitude towards the recommended procedures in relation to aseptic technique in routine clinical procedures. These studies demonstrate that written policies, formal training and years of experience contribute to an increase in cognition, work related risk reduction practices and positive attitude towards aseptic precautions in health care settings, However lack of sufficient supplies, logistics and integrated comprehensive education hinder conformity to the guidelines.

All practices or steps taking in sequence or together to ensure that injuries, infections and accidents are avoided can be regarded as risk reduction, when risk reduction practices are embraced it will ensure higher productivity and judicious use of time at work. Otegbayo et.al (2002) wrote that Olubuyide and Olawuyi (1995) believed that accidental needle stick injuries or splash on mucosa surfaces are frequent occurrence among healthcare workers and that acquired infection is higher with multiple or repeated needle stick injuries, and disregard for work related risk reduction practices (standard precautions) is frequent among health workers,

Predisposing many to acquired infections due to disregard for work related risk reduction practices. Aseptic technique use in health care settings cannot be ruled out and it's of utmost importance to be use when bypassing the skin when attending to clients.

Aseptic technique is a set of principles that must be applied in different situations, to achieve reasonably best infection control that is relative to the work and circumstances presented. It is a spectrum or continuum of techniques, which must be chosen from to perform infection control within the health system and it is a procedure used by health workersto prevent the spread of infection. It can be applied in any clinical setting since infection may be introduced to the patients through contact with pathogens in the environment, personnel or equipment. Proper aseptic technique is one of the most fundamental and essential principles of infection control, in the clinical and surgical settings. The word 'aseptic' is defined as 'without micro organisms' and aseptic technique refers to specific practices, which reduces the risk of post-surgical infection in patients, by decreasing the likely hood that infectious agents will invade body during clinical procedures. These practices are also designed to help health workers avoid been exposed to blood, body fluids, tissues and Other Potentially Infections Materials (OPIM) during surgical and clinical procedures(WHO, 2009). Engender Health (2003) examined aseptic technique as those technique which remove or kill micro organism from hand and objects, employ sterile instruments and other items; reduces patients risk of exposure to micro organisms that cannot be removed.

Aseptic techniques are necessary at all levels of care as infection is acquired in the continuum of settings where person receive health care whether long term care, home care and ambulatory care. WHO (2013) and CDC (2010) extrapolated that with commitment and hard work of hospitals, and community teams, using standardized aseptic technique will significantly reduce HAIs and no doubt contribute to saving many lives. Cherney (2013), variously advocated that health care workers are important group to be educated for attitude and behavioural change to reduce work related risk and injury to themselves as well as hospital acquired infections in the clinical settings, health education by way of aseptic technique training is imperative to reduce hospital acquired infections and risks, health workers are exposed to in healthcare settings.

The usually harmless microorganisms found on the skin of a healthcare worker, may cause infection when introduced into an area of the patient's body where they are not normally found, such as into a client's internal organs during surgery (minor or major). These normal flora can also cause infection in an immune-compromised patient who is especially susceptible to infection, patients too are at risk of acquiring infection when bacteria from the patient's own skin infect a wound when tissue has been damaged due to rough or excessive manipulation during surgery or when excessive bleeding makes the tissue susceptible to invasions by microorganisms. Therefore, aseptic technique prepares patient for surgery, safeguards against excessive manipulations and protects client from microorganisms in the environment and on the Health Care Workers (HCW) skin, clothes and hair, (Engender Health, 2013). Failure to employ or wrong use may make health care workers at risk of health care associated infections in healthcare settings.

Oyo state is an inland state in the south-western part of Nigeria, with its capital at Ibadan. It is bounded in the North by Kwara State in the East by Osun State, in the South by Ogun State and in the West partly by Ogun State and partly by Republic of Benin. It covers about 28,454 square kilometers. National Population Commission in 2006 recorded that the population figure of Oyo state was 5,591,589. It has five health zones; Ibadan, Oyo, Ogbomoso, Ibarapa and Oke Ogun health zones respectively. At each of these zones are primary health care centres and health posts that are mostly funded and managed by staff at local government level. These health facilities are the first contact for health care services at the grass root level or local government before patients are referred to higher level of care if the client needs better management, since health workers at all levels of care are susceptible to HAIs if they failed to include aseptic technique in their various procedures when attending to clients and some had been infected with one infection or the other. This study, therefore, was designed to determine the effects of aseptic techniques education on community health workers' cognition of, and attitude towards infection reduction as well as their actual work-related risk reduction practices in Oyo State..

Statement of the problem

Healthcare workers (HCWs) are a force to reckon with in any community especially during outbreak of diseases and infections as they play vital roles in curtailing such outbreak. To do this effectively without compromising their health, they need to use appropriate aseptic techniques. Studies had revealed that in some diseases, during outbreaks healthcare workers are also infected than the general populace as they provide care to patients. Examples of such can be seen in Ebola Virus Disease (EVD) outbreak spread in Lagos where out of 20 people infected, 11 were HCWs and 5 died in the process (case fatality rate of 45%). 35 cases of Lassa fever in Taraba state, Nigeria, were out of 14 death recorded, 22.90% of the cases were healthcare workers. Also previous Lassa fever cases in Benue, Ebonyi, Edo, Kogi, Nasarawa, and Ondo where 17 health workers were infected and four of them died. There was also high prevalence of hepatitis B (HBV) among HCWs who were at greater risk of HAIs due to the nature of services provided to the community (ECDC, 2015 ; Gestol.et.al, 2012 ; Ola, Odaibo, Olaleye and Ayoola, 2012 ; WHO, 2018).

The above scenario led the researcher to find out why health care workers were getting

prone to HAIs despite the fact that they are trained on how to manage hospital acquired infections. This may be due to their level of cognition, attitude and work related risk reduction practices to aseptic technique. This therefore suggests the need for them to have continual training so that cognition and attitude can be improved upon as knowledge is not static. Furthermore, many studies carried out among healthcare workers are descriptive in nature and focused on teaching hospitals and intensive care units but data are scarce on interventions programmes necessary to improve cognition, attitude and work related risk reduction practices on aseptic techniques among healthcare workers especially at the primary healthcare level which is the first level of care. HCWs no matter their experiences need continual education such as trainings, seminars and workshops to update their knowledge, develop their capacity and improve productivity. Therefore, this study was designed to determine the effect of aseptic techniques education on community health workers' cognition, attitude and work-related risk reduction practices towards infection in Oyo State, Nigeria.

Objective of the study

The main objective of this study was to determine the effects of aseptic techniques education on community health workers' cognition, attitude and work-related risk reduction practices towards infection in Oyo State, Nigeria.

Specific objectives of the study

The study achieved the following specific objectives:

1. found out the main effect of aseptic technique education on community health workers cognition, attitude and work-related risk reduction practices towards infection in Oyo State, Nigeria.
2. examined the main effect of gender on community health workers' cognition, attitude and work-related risk reduction practices towards infection in Oyo State, Nigeria.
3. determined the main effect of years of working experience on community health workers' cognition, attitude and work-related risk reduction practices towards infection in Oyo State, Nigeria.
4. established the interaction effect of treatment and gender on community health workers' cognition, attitude and work-related risk reduction practices towards infection in Oyo State, Nigeria.
5. ascertained the interaction effect of treatment and years of working experience on community health workers' cognition, attitude and work-related risk reduction practices towards infection in Oyo State, Nigeria.
6. investigated the interaction effect of gender and years of working experience on community health workers' cognition, attitude and work-related risk reduction practices towards infection in Oyo State, Nigeria
7. found out the interaction effect of treatment, gender and years of working experience on community health workers' cognition, attitude and work-related risk reduction practices towards infection in Oyo State, Nigeria.

Research questions

The study found answers to the following research questions:

- 1) What do community health workers in Oyo State perceive as the predominant cause of hospital acquired infection?

- 2) What are the reasons why health workers do not make use of aseptic technique?

Hypotheses

The following hypotheses were tested:

- 1 There will be no significant main effect of treatment on community health workers
 - A. cognition
 - B. attitudes
 - C. work-related riskreduction practices towards infection in Oyo state, Nigeria.
- 2 There will be no significant main effect of gender on community health workers
 - A. cognition
 - B. attitudes
 - C. work-related riskreduction practices towards infection in Oyo state, Nigeria.
- 3 There will be no significant main effect of years of working experience on community health workers
 - A. cognition
 - B. attitudes
 - C. work-related riskreduction practices towards infection in Oyo state Nigeria.
4. There will be no significant interaction effect of treatment and gender on community health workers
 - A. cognition
 - B. attitudes
 - C. work-related riskreduction practices towards infection in Oyo state, Nigeria.
5. There will be no significant interaction effect of treatment and years of working experience on community health workers
 - A. cognition
 - B. attitudes
 - C. work-related riskreduction practices towards infection in Oyo state Nigeria.

6. There will be no significant interaction effect of gender and years of working experience on community health workers
 - A. cognition
 - B. attitudes
 - C. work-related riskreduction practices towards infection in Oyostate, Nigeria.
7. There will be no significant 3-way interaction effect of treatment, gender and years of working experience on community health workers
 - A. cognition
 - B. attitudes
 - C. work-related riskreduction practices towards infection in Oyostate.

Delimitation of the study

The study was delimited to the following;

- 1) Pretest-Posttest non-equivalent control group quasi-experimental research design.
- 2) All community health workers in Oyo state.
- 3) Independent variable of aseptic technique education.
- 4) Dependent variables of cognition, attitude and work related risk reduction practices.
- 5) Aseptic technique training education package, structured interview and self structuredquestionnaire for training and data collection.
- 6) Multistage sampling techniques.
- 7) Ten weeks of training programme.
- 8) Descriptive statistics of frequency counts, percentages and pie charts were used to analyze the demographic data and research questions, while the inferential statistics of Analysis of Covariance (ANCOVA) was used for testing hypotheses at 0.05 levels of significance.
- 9) Fifteen (10) trained research assistants.

Limitation of the study

The limitation of this study was that the study lack empirical evidence for continuation of behaviour learnt by the participants after the study. Also since the participants were not camped, the researcher was not able to control some extraneous

variables such as watching films and internet use (for information on aseptic techniques) which may have effect on the result. However, the researcher informed the participants to avoid watching and reading texts on aseptic technique during the period. This warning, the researcher believed will reduce effects of all extraneous variables to the least possible.

Significance of the study

The outcome of this study provided information that will be used by concerned authority to make changes in the working environment. It also provided empirical basis that enable stakeholders in health sectors to put in place the necessary materials to enhance aseptic technique compliance among community health workers to prevent future spread of infectious diseases. The study may also enable stakeholders in institutions where health workers are trained to put in place necessary inputs to enhance academic performance of students and to equip them for future competency at work. The study developed the capacity of the cognition, attitude and work related risk, reduction practices of health workers that participated in the study in averting diseases outbreaks like hepatitis, HIV/AIDs, measles, Ebola and other hospital acquired infections with associated health problems, thereby averting morbidity and mortality among the health workers and those they may come in contact with in the community.

Furthermore, the empirical results finding may help to see the need for the establishment of infection control unit in the health departments of the various local governments to do periodical training and oversee activities regarding stemming infection outbreak in the community. The manual of this study may serve as resource material which may be used to give training to other health workers in other settings in the bid to curtail spread of infection among health workers in communities. The study may add to the existing body of knowledge in hospital safety and infection control studies and the study outcome may also motivate other researchers to carry out the study in similar study locations.

Operational definition of terms

The following are terms used in line with the focus of this study:

Aseptic technique education: Instruction on what to do in delivering health care services to clients/ patients without acquiring infections in primary health care centers in Oyo state.

Attitude: Health workers disposition towards aseptic technique.

Cognition: Health workers knowledge, understanding of what aseptic techniques is all about.

Community health workers: Health workers (doctors, nurses, CHO, CHEWs, health assistants and health attendants) working in health facilities in primary health care centers in Oyo state.

Effect: The impacts of ten weeks, aseptic technique education on community health workers knowledge, attitude and use of aseptic technique in discharging their duties.

Healthcare associated infections (HAIs): Infections acquired in health facilities or places health care services are provided (hospital, primary health care centers ,mobile clinic, offices e.t.c).

Work related risk reduction practices: Actions put in place by health workers to prevent them or other from having injury and transmission of infection in primary health care centers e.g. sterilization, decontamination while providing health care services.

CHAPTER TWO

REVIEW OF LITERATURE

Literatures relevant to the study were discussed under the following subheadings:

1. Conceptual Framework for the Study
2. Theoretical framework adopted in the study (Extended Parallel Process Model (EPPM))
3. Conceptual Review
 - a) Infections in health care settings
 - b) Mode of transmission of infection.
 - c) Situational analysis of healthcare associated infections in Nigeria.
 - d) Prevalence of healthcare associated infections among health care workers:
 - i. Tuberculosis infection among health care workers in Nigeria.
 - ii. Hepatitis infection among health care workers in Nigeria.
 - iii. Leprosy infection among health care workers in Nigeria.
 - iv. HIV / AIDS infection among health care workers in Nigeria.
 - v. Lassa fever infection among health care workers in Nigeria.
 - vi. Severe acute respiratory syndrome (SARS) infection among health care workers in Nigeria
 - vii. Ebola infections among health care workers in Nigeria.
 - e) Methods of reducing spread of infection/infection control.
 - f) Concept of Aseptic technique.
 - g) Utilisation of Aseptic technique in Nigeria by health workers.
 - h) Standard precautions practices.
 - i) Use of personal protective equipment a necessity in preventing infection and injuries.
 - j) Health Education and behavioural change.
- 4 Empirical Review:
 - a) Aseptic technique training on cognition of health workers
 - b) Aseptic technique on attitude of health workers
 - c) Work related risk reduction practices among health care workers
 - d) Effect of gender on cognition, attitude and work related risk reduction practices.

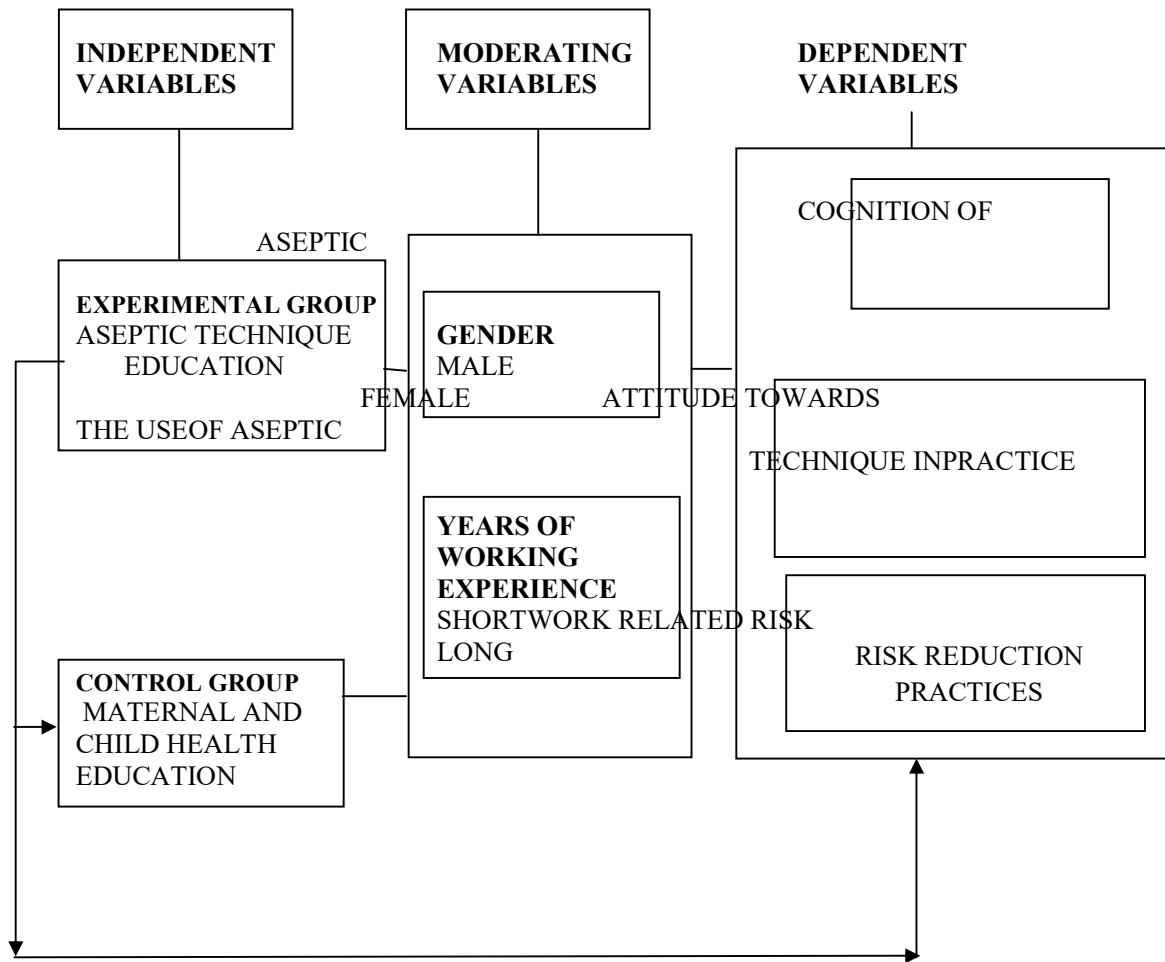
- e) Effect of years of experience on Cognition, Attitude and work related risk reduction practices

5 Appraisal of Reviewed Literature

Conceptual framework for the study

Fig 2.1: Conceptual Framework for the Effect of Aseptic Technique Education On Community Health Workers Cognition, Attitude and Work Related Risk Reduction Practices Towards Infection





Source: Self Developed.

Conceptual model

In this study, a conceptual framework was developed by the researcher around the intervention to increase health care workers cognition and attitude towards aseptic technique and to practice appropriate work related risk reductions procedures in the health care setting. From the model, Aseptic Technique Education is the treatment package to be used in the study, the package is referred to as the independent variable in the framework because it's the variable to be manipulated by the researcher in order to determine its effect on the dependent variables which are cognition of aseptic technique, attitude towards the use of aseptic technique in their various practices and reduction in work related risk practices. The intervening variables are two which are

gender and years of experience, gender will be at 2 levels i.e male and female, years of experience is also at two levels of short and long.

Theoretical framework for the study (Extended Paralled Process Model)

The Extended Paralled Process Model (EPPM) is a frame work developed by Witte in 1994 in an attempt to predict how individuals will react when confronted with fear inducing stimuli. It is used in health communication messages to persuade audience members to adopt a healthy behaviour. In order for fear-based campaigns to be effective they must induce a moderately high level of fear and a higher level of self efficacy and response efficacy. This EPPM model defines four key factors to predict the likely outcome of communication which involve a fear appeal.

Self-efficacy: This is the perception the individual has that he/she is competent enough to use aseptic technique to control the risk.

Response efficacy: The perception the individual has that if he/she uses, aseptic technique it,will successfully control the risk.

Susceptibility: The perception the individual has of how he/she can be infected in the health care setting.

Severity: The perception the individual has of the outcome of being infected in the health care settings.

Based on the impact above the EPPM model predicts three possible outcomes. They are:

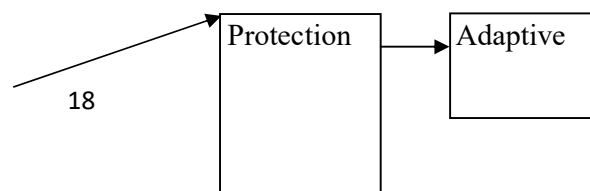
- 1) Danger control:** When individuals perceive that severity and susceptibility are high and also perceives that they are competent to take mitigating action then they are likely to act to control the danger. If a health worker found out that the patient he/she is in charge of is infected and that he/she can be infected and also if he/she knows has competency in using aseptic technique then he/she is likely to control the danger either to self or to the client.

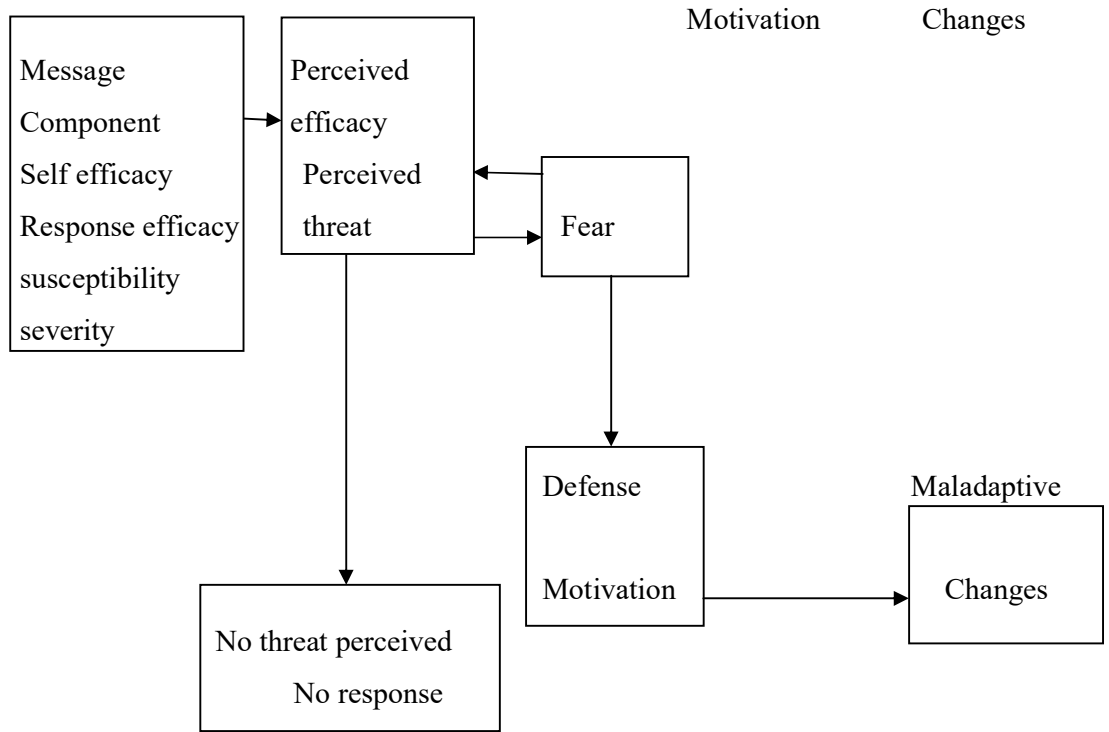
- 2) **Fear control** – The predicts that if an individual perceives ability to control a risk as low, even if the severity and susceptibility is perceived as high, then he/she is likely to take steps to control fear instead. If a health worker sees that to make use of aseptic technique at a point in time within ability is low and the severity of infection and susceptibility is high, then he/she can control fear and take appropriate steps to see that infection is controlled.
- 3) **No response** – The severity or susceptibility of the danger was perceived as low. Basil, Basil, DeshPande , Lavack (2013) were of the opinion that EPPM proposes fear appeals which are most effective when threat and efficacy are combined. Person’s perceived threat of the event described (for example, like hood of infection occurrence) perceived threat has two parts; the degree to which the person feels he or she is susceptible to the infection; and the perceived severity of the infection.

A health worker might perceive he/she is not susceptible to infection because the patient looks like a person not infected as in case of HIV. The same health worker might recognises that not using glove, washing of hand in the health care setting can cause severe injury and infection although, he/she knows the harmful consequences of Hals and may decide not to invest in safety activities and equipment because he/she thinks he/she is unlikely to experience any injury/infection.

Perceived self efficacy and belief in response efficacy- Self efficacy is defined by Bandura (1997) as one’s belief in the ability to exhibit urgency and control over events to achieve desired outcome. Response efficacy is the person’s belief in the worth of whatever is being recommended as a safety procedure or device.

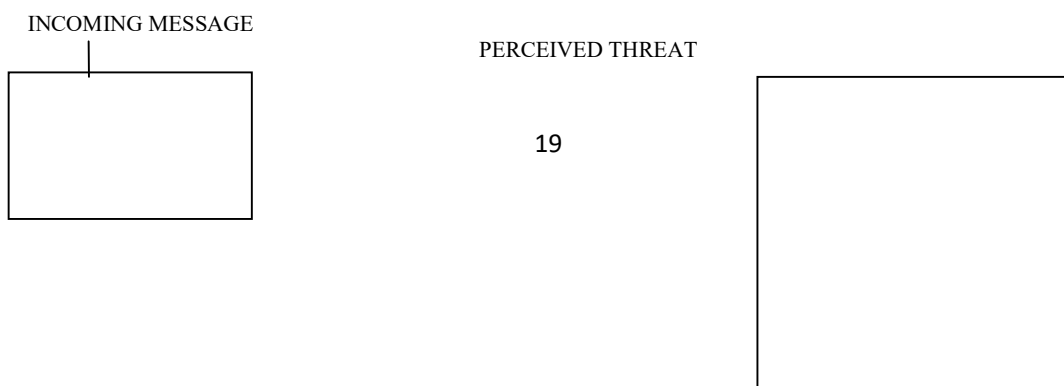
Fig: 2.2: Extended Parallel Process Model

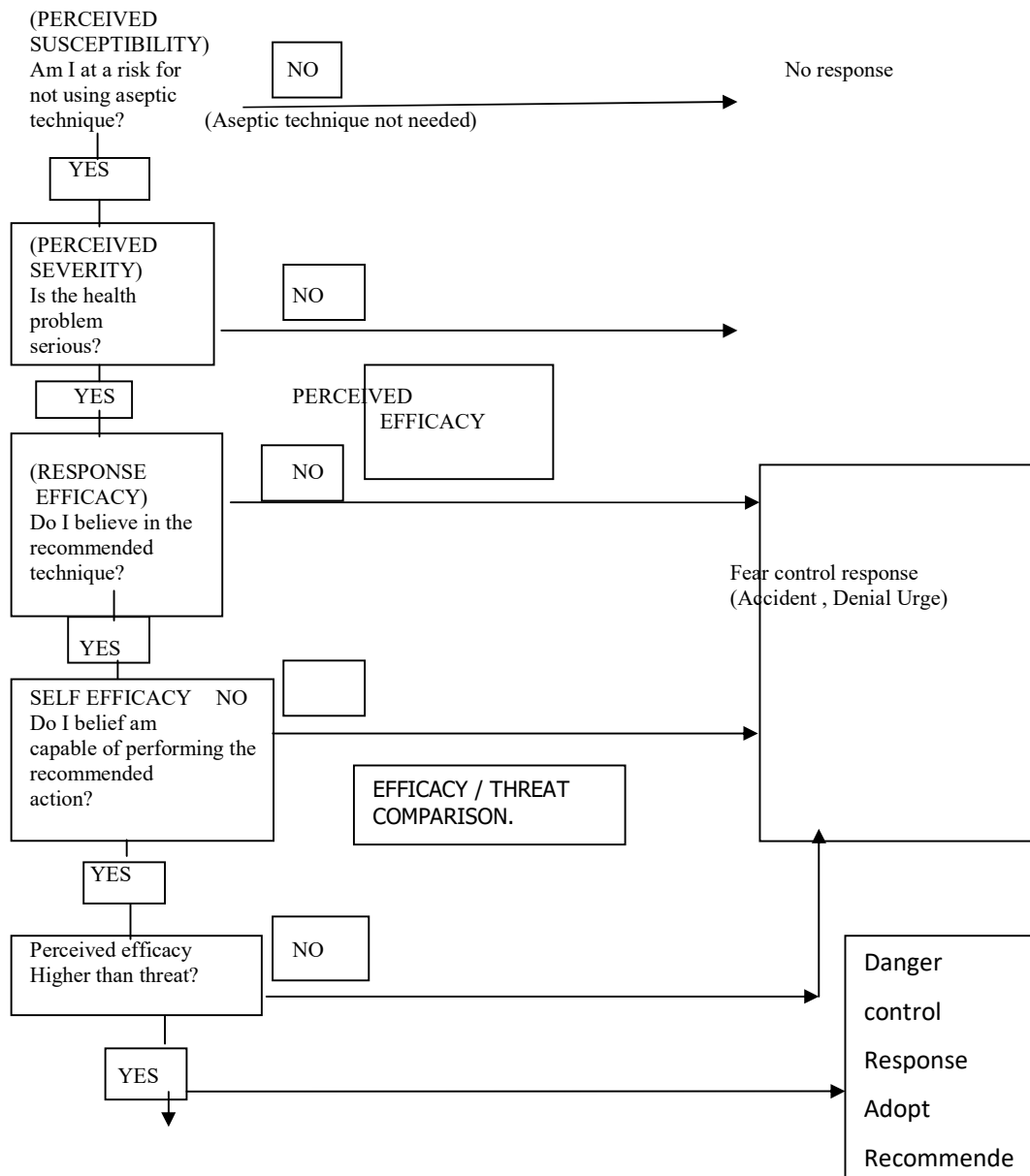




Source: Witte, K (1994)

Fig 2.3:Extended Parallel Process Model





Source : Thesenvitz, J(2000). *Understanding and using fear appeals*. Toronto : University of Toronto

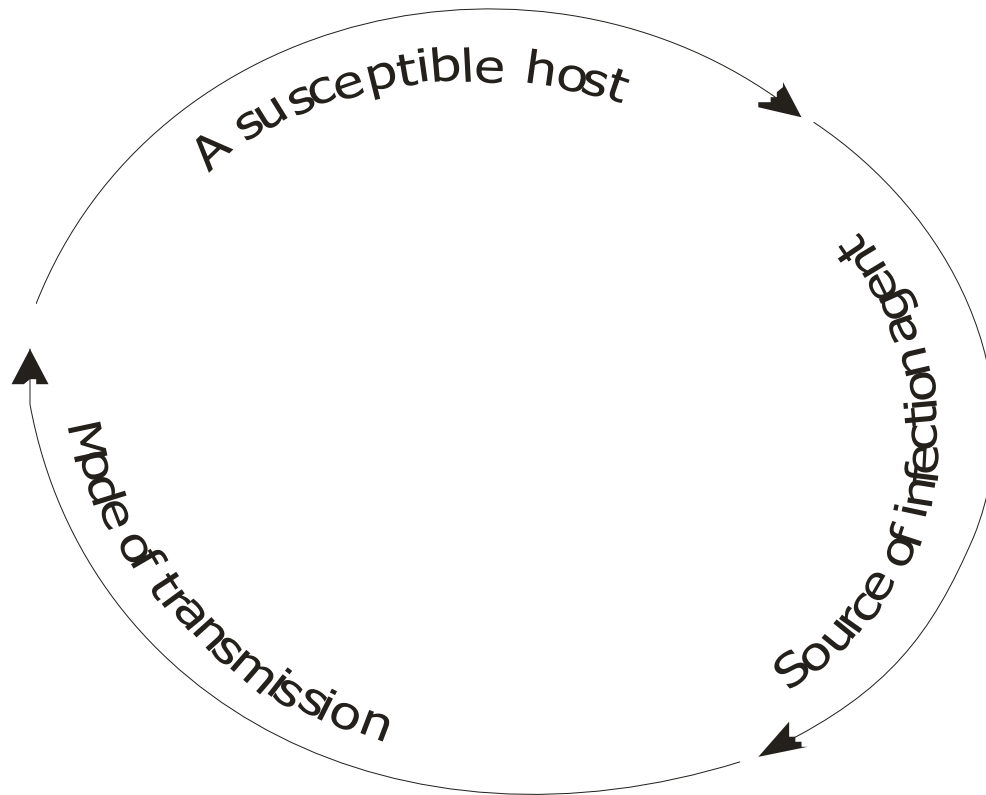
Infection in health care settings

Infection in health care settings is known as nosocomial infection also refers to as hospital acquired infections or healthcare associated infections (HAIs). These are

infections that are not present in the patient at the time of admission to hospital but develop during the course of stay in the hospital and also infections health care workers get infected with, in the process of rendering health care services to the patients(CDC, 2008 ; Amy, 2008; Emily, Sydney and Trish, 2011;Health protection Agency, (HPA) 2012;Okonufua et al, 2012 and Osazuwa, Azodo, Ehizele Obuekwe, 2012).Infectious agents are biological agents, which cause diseases or illness to their hosts.Many infectious agents are present in health care settings. Patients and health care workers are the most likely sources of infectious agents and are also the most common susceptible hosts. Other people visiting and working in health care may also be at risk of both infection and transmission. These unanticipated infections develop during the course of health care treatment result in significant patient illnesses and deaths (morbidity and mortality); prolong the durations of hospital stays and necessitate additional diagnostic and therapeutic interventions, which generate added costs to those already incurred by the patients underlying disease (Amy, 2008;NHMRC, 2010; Uneke, Ndukwe, Oyibo, Nwakpu, Nranu and Prasopa-Plaizier, 2013).

Since the early 1980s HAIs surveillance has monitored ongoing trends of infection in health care facilities and with the applications of published evidence – based infection control strategies, a decreasing trend in certain intensive care unit (ICU) health care associated infections has been reported through national infection control surveillance over the last ten years though there has also been an alarming increases of microorganisms isolates with antimicrobial resistance,(Haley, Culver, and White, 1985;CDC, 1999; Weinstein, Siegel, and brennan, 2005; Disability Resource Directly, 2014) is of the opinion that the purpose of a hospital is to make people feel better than when they were admitted, however this can really be bad if people now develop a hospital acquired infection. NHMRC, (2010) identified three main elements required by infection which are, a source of the infection agent, a mode of transmission and susceptible host. This is known as the chain of infection (figure 4) and the interruption of this cycle is a strategy to limit the spread of infection.

Fig 2.4: Chain of infection



Source: National Health and Medical Research Council, 2010

HAIs has become more common as medical care has grown more complex and patients have become more complicated and HAIs is associated with significant morbidity mortality and cost. They are considered a serious problem in the health care services as they are common causes of illness. Currently between 5% - 10% of patient admitted to acute care hospital acquires at least one infection and over the last decades has increased in both the United States and Europe, (Erikson, 2005; Pittet, 2005; Hopman, 2007; Kleven, 2007).

There are two forms of HAIs according to Ayliffe(1998),

- i. Endogenous infection, self infection or auto infection - In this type of infection, the causative agent of the infection is present in the patient at the time of admission to hospital but there are no signs of infection. The infection develops during the stay in hospital as a result of the patients altered resistance.

- ii. Cross-contamination followed by cross infection- During the stay in the hospital, the patients comes into contact with new infective agents, becomes contaminated and subsequently develops infection.

The transition from contamination to infection depends on the interaction between the contaminating organism and the hosts, the most important determinants of infection are the nature and number of the contaminating organisms. The sources of infection in health care facility and of the preceding contamination may be the personnel, the patients or the inanimate environment(Nihon,2002;Gastmeier, 2005;Amy 2008; HPA, 2012; NHMRC, 2010; Indang, Mfon, Faith and Magaret, 2014).The hospital environment can be contaminated with pathogens salmonella or shigella Spp, Escherichia Coli 0157 or other pathogens may be present in food and cause outbreak of diseases just as they can in a community outside the hospital, (Bhalla, Pultz, and Gries 2004;Camine and Fraser, 2005).The health worker can also be the source of outbreak of hospital acquired infection, especially any health worker who is infected or colonised (a carrier). If there is a symptoms of frank infection it will make health workers know they can transmit infection and or to managerial staff, infected personnel are usually dismiss from patient care duties but in a symptomless carrier, who is contaminated or colonised by potentially pathogenic organisms but does not develop infection.

A typical example is staphylococcus aureus which may be carried in the nasal passages of 30-60% of personnel, feacal carriage of enteropathogens such as salmonella Spp, also occurs frequently, but the prevalence varies according to the region. Other conventional pathogens that can be found in symptomless carriers include streptococcus pyogenes, corynibacterium diptheriae, neisseria meningitis, hepatitis B virus and cytomegalovirus. Contamination of patients by carriers can give rise to an outbreak of disease.The source of most hospital epidemics is infected patients. These microorganisms are often released into the environment in very high numbers, exceeding the minimal infective dose and contaminate other patient and health care workers who subsequently develops hospital acquired infection.

The mode / routes of transmission of infection

Three main route of transmission were identified by (Bolton Primary Care Trust (BPCT), 2009;HPA, 2012;NHMRC, 2013; Laura, 2014).

- i Contact which could be direct or indirect.
- ii. Airborne transmission.
- iii. Vector borne transmission.

NHMRC (2010), identified direct transmission which occurs when the transfer of microorganisms result from direct physical contact between an infected or colonized individual and a susceptible host, for example health workers contaminated through touching a vulnerable site (such as a wound) on a patient.

Indirect transmission involves passive transfer of an infectious agent to a susceptible host via an intermediate object or formite. Garner and Fayero, (1986), identified indirect transmission as the frequent route of transmission when the infected patient touches and contaminate an object, an instrument or a surface. Subsequent contact between that item and another patient is likely to contaminate the second individual who may develop an infection. Laura, (2014) noted filthy or dirty hospital as a factor causing deaths in hospital settings and this can be due to vector transmission and airborne transmission as microorganisms are dispersed into the air and in countries in which insects arthropods and other parasites are wide spreads, can become contaminated by contact with excreta or secretions from an infected patients or environment which is filthy and transmit the infective organisms mechanically to other patients.

Situational analysis of hospital acquired infection in Nigeria

All health care workers at the three levels have good knowledge that patients could be a source of HAIs. However, knowledge of hospital staff,equipmentand the environment as source of transmission of HAIs was good for health care workers in both tertiary and secondary level of care but poor among primary health care workers, although they are at the frontline defense for applying daily infection control practices(Adebimpe, Asekun, Bamidele, Abodunrin and Oluwu, 2011). They also reported that health care workers have good knowledge and attitude but poor practices

characterize HAIs among tertiary and secondary level health workers in Osogbo. These indices however are must and ranges from fair to poor among health workers at the primary health care (PHC) level, (Parker and Goldman 2006;Ellison 2007). A study by Duseja, Aora, Masih Singh, Gupta, Behera, Chawa & Dhuman (2002) among surgeons in Lagos State reveal that there was higher incidence of Hepatitis B Virus among surgeon compare to the population and the prevailing poor economic situation has compromised standards giving rise to inadequate provision of barriers device for health care workers. The study also shows that surgeons in Nigeria have high HBV infection prevalence than the general population.

Amoran and Onwube, (2013) find out that the issue of standard precaution in northern Nigeria (Nasarawa state) among those that were exposed to blood products and body fluid compared to those that had not been exposed in the last 6 month, lack of access to affordable treatment and lack of equipment required to ensure safety of health care workers and prevent the spread of infectious diseases from patients to health workers, is a crucial issue that need urgent attention in Nigeria and other low income countries in Africa. He also opined that training of health workers in infection control practices should be looked into as recent training in infection control practices was not significantly associated with the practice of universal precaution. However studies have reported that education,ongoing quality improvement projects and preventive programs play a major role in augmentation of knowledge and safe behaviour of health care workers, (Sokas, Simmens and Scot 1993; Wang, Fsennie, Bingess and Williams, 2003).Two interventions programme were done in Nigeria to improved health workers HIV/related knowledge, attitudes and perceived counseling and treatment skills (Uwakwe, 2000;Ezedinachi, Ross, Meremiku, Essien, Edem Ekure, 2002). However one of these studies did not address system barriers and the use of universal precaution did not improve due to continued lack of supplies (Uwakwe, 2000).

Puerperal sepsis accounts for 12% of maternal deaths in Nigeria and proper infection control practices can reduce the incidence of this infection in Nigeria (Okonofua et al, 2014).Nigeria is one of the six countries that account for 50% of global maternal deaths due to puerperal sepsis, (Hogan, foreman, Naghavi 2010).

Puerperal sepsis is defined as a temperature rise above 38°C maintained over 24hr occurring from the end of the first to the end of the tenth day after child birth or abortion. According to WHO, (1992) is the third leading cause of death among pregnant women and account for 15% of maternal death worldwide, (Murray, Lopez, Abouzahr, Aahmar, Gudit 1990; Carmen and Claudia, 2003).

Hospital acquired infection among health workers

Hospital Acquired Infection (HAIs), Health Care Associated Infection (HCAI) are infections acquired as a result of healthcare intervention. Most HAIs and HCAI occur sporadically. However, epidemics of HCAI may also take place and are called a Nosocomial Outbreak (NO), (Lisa, Petra, Frank and Ralf Peter 2013). NO that took place between 1958 through 2006, 152 NO took place in 26 countries, mainly in the US (67 NO), the UK (29 NO) and France (8 NO) NO lasted between 1 and 287 (mean: 28.4, median 10.5). In patient 1,449 patients at least 51 fatal causes were affected ranging from 1 – 75 patients per NO. There were also at least 960 documental cases of nosocomial infection among the 1,449 patients. The most frequent nosocomial infections were surgical site infections (551: 286), HBV infections (212), septicemia (67), gastroenteritis (42), Hepatitis C virus Infection, HCV (21), urinary tract Infection (20) and meningitis (13). Regardless of the number of patients the spread of the pathogen via direct contact was the main route of transmission followed by droplets and airborne transmissions. The sources of these infections were health care workers, (Vonberg, Weitzel-Kage, Benke, Gastmeir, 2011).

Transmission of bacteria occurred in 108 of the 152 NO, viral spread (34 NO) and fungi (10NO). The most frequently detected micro organisms in NO caused by HCW are staphylococcus aureus (49 NO), HBV (27 NO) and group A streptococci (19 NO). Specific route of transmission still remain unknown in 8.6% of all N.O, (CDC, 1989; Dave, Reith, Nash, Marples and Dulake, 1994; Harpaz, Von et.al 1996; Vonberg, weltzel, Behnke, 2011; Lisa, Petra, Frank and Ralf –peter, 2013). Physician despite their rather low proportion among hospital staff were identified as the group of professionals who caused most outbreaks (59 NO) out of which 30 NO were caused by surgeons compared to 56 NO caused by nurses. Other professional

frequently involved were technical staff (9 NO) kitchen Staff (5 NO) and Midwives (5 NO). In the last 20 years there had been some tendency towards smaller outbreak due to emphasis on hand hygiene, HCW being aware of their carrier status and Infection Control guidelines issued by CDC and WHO to be followed in healthcare settings (CDC , 1985; CDC, 1989; CDC, 2010).

Tuberculosis infection among healthcare workers

Transmission of tuberculosis (TB) in healthcare settings to both patients and HCWs, had been reported from virtually every country of the world. Regardless of local TB Incidence, TB transmission occurs through droplet nuclei aerosolized by patients with Infections pulmonary TB and inhaled by other persons. Transmission most of the times occur from unrecognized or TB not treated appropriately. Risk of transmission varies by settings, occupational groups, local prevalence of TB, patient population and effectiveness of TB Infection Control Measures (NIOSH, 2002; Menzies, Joshi and Pai, 2007; Baussano, Nuna, Williams, Purrela, Busianu, Scano, 2011). In a study by Baussano et al (2011) their findings show that HCWs are at higher than average risk for infection with *Mycobacterium tuberculosis* and of developing TB disease. The results of their analysis show that the risk for TB among HCWs is consistently higher than the risk among the general population worldwide, and they confirmed TB as an occupational disease. To support the view above, Cassis, Estere, Guerola, Garcia-olive, Roldan-merino, Martinex-Rivera, Ruiz-manzano, (2013), in a study in Spain among HCW in risk for occupational tuberculosis (TB) exposure found out that incidence of latent tuberculosis infection is high, although it decreased throughout the follow-up period due to maintaining surveillance programme among the HCWs.

Joshi, Reingold, Menzies and Pai, (2006) in a systematic review of tuberculosis prevalence in low and middle – income countries found that the annual incidence of TB among HCWs ranged from 69 to 5,780 per 100,000 and the attributable risk for TB disease in HCWs compared to the risk in the general population ranged from 25 to 5,361 per 100,000 per year. Certain work location like in-patient TB facility, laboratory, internal medicine and emergency facilities are at higher risk of acquiring TB disease. Studies reinforce the need to design and

implement simple, effective and affordable TB Infection control programs in health care facilities, more especially in low and middleincome countries like Nigeria.

Hepatitis infection among healthcare workers

Viral hepatitis is as old as the history of medicine as about a third of the world's population has been infected with the hepatitis B virus (HBV). HBV infection is a public health problem with 350 million chronic carriers worldwide. Prevalence varies greatly in different part of the world but is higher in tropical regions causing both acute and chronic liver diseases,(Szmuness, Dienstag, Pricell, Steven, Wong and Ikram, 1977; Manjolis, Alter and Hadler,1991). Studies in Nigeria have reported prevalence rate of 11.6% from Maiduguri 13.8% from Lagos, 4.3% from Port Harcourt, 5.7% from Ilorin,8.3% from Zaria, 17.1% from female sex workers 14.9% from healthy blood donors and 25.7% among surgeons (Nasidi, Vyazor, Numunbe, Azzan and Ancinler, 1983;Harry, Bajani and Moses, 1994;Bello, 2000;Ejele, Nwauche and Erhabor,2004; Akani, Ojule, Opirum and Ejilemele,2005; Agbede , Iseniyi, Kolawole and Ojuowa, 2007; Luka, Ibrahim and Iliya, 2008; Forbi, Onyemauwa, Gyar, oyeleye, Entonu and Agwale, 2008)

This study was in line with what was reported by Bello(2000) that the prevalence of HBV among the surgeons was 25.7% compare to 15.0% in the control group, the study showed a higher prevalence of HBV infection among surgeons than in the general population in Lagos. All the studies recommend vaccination for all health workers in view of the risks of transmission of HBV to patient and the use of aseptic techniques during their practices.

HIV/AIDS infection among healthcare workers

HIV (Human, immune deficiency virus) and AIDS (Acquired immune deficiency syndrome) is another infective disease that can be acquired by HCWs through exposure to body fluid like blood, semen and vaginal fluid without proper infection control measures especially if the HCW has a broken skin or needle stick injury in the performance of day to day activities in the health facilities.Studies on HIV prevalence among health workers usually focus on occupational exposure to

HIV, little is known about HIV in this group. However it is expected that HIV prevalence among health workers will reflect prevalence in their society .In South Africa HIV prevalence is high as reported by Shisana, Hall, Maluleke, Chaoveau and Schwabe, (2004) in a study among 721 health workers in South Africa through December 2001, there were 57 documented cases of occupational HIV transmission to health care workers in the United States and only one reported case has been confirmed since 2001, (CDC, 2008).

The proper use of gloves and goggles along with safety devices to prevent injuries from sharp medical devices can help minimize the risk of exposure to HIV in the course of caring for patient with HIV, when workers are exposed; the CDC recommends immediate treatment with a short course of antiretroviral drugs to prevent infection. Health workers have high knowledge of the history and transmission of HIV/AIDs but 46% of the HCW population expressed fear in the handling of AIDs patients though a sizeable proportion were knowledgeable of the recommended procedures in relation to aseptic technique in routine clinical procedures but they complained of lack of sufficient supplies and logistics which hindered their conformity to the guidelines (Karani, Katsivo, Muhami Lwafama and Ntsekhe 1990).

LASSA fever infection among healthcare workers

Lassa fever is an acute, highly infectious viral haemorrhagic illness caused by Lassa fever virus. The reservoir is *Mastomys natalensis* first described in 1969 in the town of Lassa, in Borno state, Nigeria, Frame, Baldwin, Gocke and Troup (1970). The infection is endemic in West African countries and causes 300,000-500,000 cases annually, with approximately 5,000 deaths, (Ogbu, Ajuluchukwu, Uneke, 2007). Outbreaks have been observed in Nigeria, Liberia, Sierra Leone, Guinea and the center African Republic. It is believed that human infections also exist in Democratic Republic of the Congo, Mali and Senegal. The primary animal host of the Lassa virus is the Natal multimammate mouse (*Mastomys natalensis*) an animal indigenous to most of sub-Saharan Africa (Werner and Dietrich, 2004).

In Northern and central Edo Lassa virus was detected in 25 of 60 patients (42%) screened, this virus affects adult and children alike, no matter the age anyone can be at risk of Lassa, Lassa virus is Zoonotic (transmitted from animal). In the rat, the infection is in a persistent asymptomatic state and the virus is shed in their excreta (urine and faeces) which can be aerosolized, (Richmond, and Baglolle, 2003; Ehichioya et.al, 2012). Infection in humans typically occurs by exposure to animal excrement through the respiratory or gastrointestinal tracts, inhalation of tiny particles of infective material (aerosol) is believed to be the most significant means of exposure. It is possible to acquire the infection through broken skin or mucous membrane that is directly exposed to the infective material. Transmission from person to person has also been established, presenting a disease risk for healthcare workers clinically Lassa fever are difficult to distinguish from other viral haemorrhagic fever such as Ebola and Marburg and from common febrile illnesses such as malaria.

These place health workers at a receiving end, if proper infection control measures are not followed, they can be infected. In a study reported in Taraba State by Gesto et.al, (2012), a total of 35 cases were reported, nine of 35 cases were laboratory confirmed (25.7%). Altogether 14 deaths were recorded, most of the cases were healthcare workers (22.90%) and the commonest features were fever, cough, bleeding from orifices. The outbreak affected mostly healthcare workers that might be ignorant of the diagnosis and due to lack of proper infection control measures. Jimota (2016) reported the death of a medical doctor due to Lassa fever in River state, Nigeria after having contact with infected patients in his clinic in the course of treating them. WHO (2018) reported that from January 1 through March 18th 2018, 1495 suspected cases of lassa fever and 119 deaths have been reported from 19 states which included Anambra, Bauchi, Benue, Delta, Ebonyi, Edo, Ekiti, Gombe, Imo, Kaduna, Kogi, Lagos, Nasarawa, Ondo, Osun, Plateau, Rivers, and Taraba states as well as Federal Capital Territory.

During this period 376 patients were confirmed, nine were classified as probable, 1084 tested negative and 26 are awaiting laboratory results (pending). Among the 376 cases classified as confirmed and nine classified as probable, 95 deaths were reported (case fatality rate for confirmed and probable cases = 24.7%).

Seventeen health care workers in six states (Benue, Ebonyi, Edo, Kogi, Nasarawa, and Ondo) have been infected, four of whom have died. The infection of 17 health care workers highlights the urgent need to strengthen infection prevention and control practices in all health care setting for all patients, regardless of their presumed diagnosis. Given the high number of states affected, triage and initial clinical management will likely happen in health centres that are not appropriately prepared to care for patients affected by Lassa fever and the risk of infection in health care workers will increase

SARS infection among health care workers

Severe Acute Respiratory Syndrome (SARS) is a rapidly spreading, potentially fatal infectious viral disease. It was recognized as a global threat in March 2003, the viral disease first appeared in Southern China in November 2002 and spread to more than 24 countries in Asia, Europe, North America and South America and by spring of 2004, the outbreak appeared to be over, (CDC, 2004). But not after it had claimed disease the lives of many doctors, nurses, pharmacist, paramedics because the virus had a highly unusual pattern of transmission. Its peak of infectivity occurred late in the course of which the patients were at their most unwell and usually in the hospital, (Nursing World Nigeria (NWN), 2013).

The infection killed hundreds and infected thousands more, but its impact would have been far more devastating had it not been for the bravery of a handful of doctors and nurses, it was highly contagious as more than 8,000 people around the world were infected and more than 770 died, (NWN, 2013). A virus known as SARS – associated Coronavirus (SARS –COV) causes the illness and when viewed under a microscope coronavirus are a group of virus that look like they have a crown or halos. It commonly causes mild to moderate upper –respiratory illness in human, the incubation period from exposure to infection is two to seven days, although infection has taken as long as 10days in some cases, however not everyone exposed becomes ill. SARS can be difficult to recognize because it mimics other respiratory disease such as influenza, it generally begins with a fever higher than 100.40F (380c) and one or more of the following symptoms, headache, overall feeling of discomfort, body

aches & chills, sore throat, cough difficult breathing, shortness of breath, hypoxia (insufficient oxygen in the blood) and diarrhoea (10 percent to 20 percent of patient), (CDC, 2004).

SARS-COV spreads from one person to another mainly through close contact with a SARS patient, when a person with SARS coughs or sneezes without covering his or her mouth, respiratory droplet containing living virus can spray up to 3 feet and invade the mucous membranes of another person. Individual in close contact with someone with SARS are most at risk. The most feared means of transmission of infectious diseases like LASSA, SARS are medical personnel treating patients in hospital, (Chikwe, 2014). In the prevention and control of SARS, CDC, (2004) identify proper hand hygiene masks, gloves, and protective gowns and proper infection control measures to prevent the spread of SARS. Hand hygiene measures was use to curtail the spread of SARS in 2003 as health workers wash their hands before contact with patients and after contact, between patient to patient and using other infection control measures, (Amy, 2008). As patients comes to the hospital for treatment health workers can contact infection if proper infection control measures/ aseptic technique are not followed and this can spread to their homes and down to the communities including educational institutions.

Ebola infection among health workers

West Africa is experiencing the largest Ebola virus disease (Ebola) epidemic in recorded history. Health care workers (HCWs) in West Africa are at high risk for Ebola infection owing to lack of appropriate triage procedures, insufficient equipment, and inadequate infection control practices . In Liberia, as of August 14, 2014, a total of 810 cases of Ebola had been reported, including 10 clusters of Ebola cases among HCWs working in facilities that were not Ebola treatment units (non-ETUs). The Liberian Ministry of Health and Social Welfare and CDC investigated these clusters by reviewing surveillance data, interviewing county health officials, HCWs, and contact tracers, and visiting health care facilities. Ninety-seven cases of Ebola (12% of the estimated total) were identified among HCWs; 62 HCW cases (64%) were part of 10 distinct clusters in non-ETU health care facilities, primarily

hospitals. Recent epidemiology of Ebola infections among HCWs in Guinea, national Viral Hemorrhagic Fever (VHF) surveillance data were analyzed for HCW cases reported during January 1–December 31, 2014. During 2014, a total of 162 (7.9%) of 2,210 laboratory-confirmed or probable Ebola cases among Guinean adults aged ≥ 15 years occurred among HCWs, resulting in an incidence of Ebola infection among HCWs 42.2 times higher than among non-HCWs (Grinnell, Dixon, Monica Patton, David Fitter, Bilivogui, Johnson, Dotson, Diallo, Rodier, Raghunathan, 2015).

Table 1: Number of EVD cases and deaths among healthcare workers*, as of 21 June 2015

Country	Cases	Deaths
Guinea	189	94
Liberia	378	192
Mali	2	2
Nigeria	11	5
Sierra Leone	305	221**
Spain	1	0
United Kingdom	2	0
United States	6	1
Italy	1	0
Total	895	515

* Listed by country of origin

** Data as of 17 February 2015

Source: Data are based on official information reported by ministries of health and WHO.

Methods used in reduction of infection

The most common types of infections are: Catheter associated urinary tract infections. This is when germs travel along a urinary catheter and cause infections in the bladder or kidney. Surgical sites infections, an infection that occurs after surgery in the part of the body where the surgery took place. Blood stream infections – When microorganisms enter the blood by way of a catheter or tube that is placed in the vein. According to CDC, (2010) one in 25 hospitalised patients will get HAIs as a result of the care they receive in hospital. WHO, (2010) identified thirty-five percent of health care facilities across the globe that does not adequately promote hand hygiene practices to prevent infection.

NHRMC (2010) opined that a break in the chain of infection brings about prevention of infection in health care settings. Ayliffe (1992) identified standard precaution and isolation of infected patients, cleaning of hospital environment, sterilization can go a long way to reduce infection in health care settings. Also two main principles, separating the infection source from the rest of hospital and cutting off any route of transmission, goes a long way to reduce the spread of infections. The behaviours of health care providers and their interactions with the health care system influence the rate of HAIs. Physicians and nurses have the unique opportunity to directly reduce HAIs though recognizing and applying evidence based procedures to prevent infections among patients and protecting the health of staff, (Salah, Fayda, Meshal, Isaeed, Gamal and Medhat, 2012)

CONCEPT OF ASEPTIC TECHNIQUE

Meaning of aseptic technique

Aseptic technique is employed to maximize and maintain asepsis, which is the absence of pathogenic organisms in the clinical settings, (Cathy, 2000; Kathy 2003). The goal of aseptic technique is to protect a patient from infection and to prevent the spread of pathogens. Aseptic technique is vital in reducing morbidity and mortality associated with surgical infections, (Association of Perioperative Registered Nurses (AORN), 2012; Christeney, 2013). Aseptic technique can be applied in any clinical setting since pathogens may introduce infection to the patients through contact with the environment, personnel or equipment. This is a set of principles that must be applied in different situations to achieve best infection control that can reasonably be achieved relative to the work and circumstances presented, it is a spectrum or continuum of techniques which must be chosen from to perform each setting activities within the health system. It is a procedure used by medical staff to prevent the spread of infection.

Proper aseptic technique is one of the most fundamental and essential principles of infection control in the clinical and surgical settings. The word 'aseptic' is defined as 'without microorganisms' and aseptic technique refers to specific practices which reduces the risk of post-surgical infection in patients by decreasing

the likely hood that infectious agents will invade body during clinical procedures. These practices also are designed to help the health worker avoid been exposed to blood, body fluids, tissues and other potentially infections materials (OPIM) during surgical and clinical procedures. Engender Health (2003) examined aseptic technique as those technique which; remove or kill micro organism from hand and objects, employ sterile instruments and other items; reduces patients risk of exposure to micro organisms that cannot be removed.

The usually harmless microorganisms found on the skin of a healthcare worker (HCW) may cause infection when introduce into an area of the patient's body where they are not normally found, such as into a client's internal organs during surgery. These normal flora can also cause infection in an immune compromised patient who is especially susceptible to infection, patients to are at risk of acquiring infection when bacteria from the patient's own skin infect a wound when tissue has been damaged due to rough or excessive manipulation during surgery or when excessive bleeding makes the tissue susceptible to invasions by microorganism. Aseptic technique prepares patient for surgery, safeguards against excessive manipulations and protects client from microorganism in the environment and on the HCW's skin, clothes and hair, (Engender Health, 2013).

History of aseptic technique

Ancient record shows that antiseptic date far back into history, the ancient Chinese, Persians and Egyptians had method for water sanitation and antisepses for wounds. The ancient Greek and Romans use silver vessels to store fresh liquids and wine settlers in Australian, outback put silverware and pioneers of the American west put silver and copper coins in drinking water to keep it fresh and prevent algae, settlers in the Australian outback put silverware in drinking water for the same purpose, mercuric chloride was use to prevent sepsis in wounds by Arabian physician in the middle Ages. Hypochlorite iodine was introduced as a treatment for open wounds in 1825 and 1839 respectively. In 1861 Louis Pasteur proved that microorganisms caused spoilage and could be transported in the air, these experiments were the basis for the development of aseptic techniques. He also showed that heat could kill microorganisms; this process was later named pasteurization. Using this

knowledge gained from Louis Pasteur, a scientist Dr Ignaz Semmelweis reduced the number of postpartum infections (puerperal sepsis) in the wards of Vienna's lying-in-hospitals by urging doctors to wash their hands between patients.

By the mid-nineteenth century, post operative sepsis infection accounted for the death of almost half the patients who underwent major surgery and in 1860 an English Surgeon Joseph Lister heard about Pasteur's work. He began to soak his surgical dressings in carbolic acid (phenol) because he heard the previous year that carbolic acid had been used to treat savage in carlise and the fields that had been treated were now free of parasite causing disease. This led to a dramatic decrease in the number of post operational infections because before the discovery of antiseptis by Lister about 80% of surgical patients contracted gangrene. In 1878, Lister perform a simple knee operation which often resulted in generalised infection and death but it brought a turning point for Lister whose germ theory was still opposed by America but the success of the operation forced them to accept that his methods greatly added to the safety of operative surgery. The culminating of his emphasis on the principle of preventive medicine led to the opening of the institute of preventive medicine in 1891. These are a few of the reasons why Joseph Lister is often referred to as "father of antiseptic surgery".

Paul Ehrlich a German scientist, later advanced the idea of using chemicals to kill microorganisms by testing many more compounds. He eventually found a chemical that was successful against syphilis. Ernest Von Bergmann was another scientist that had a significant impact on the field of sterilisation. He introduced steam sterilisation under pressure for treating instruments and all other medical equipment used for a surgical patient. William StewartHalsted, a famous surgeon from John Hopkins introduced sterile rubber gloves to the field of medicine. Aseptic technique had evolved over the years due to scientists finding solution to infections in health care settings.

Types and principles of aseptic techniques

These are two types of aseptic technique

- 1) Surgical Aseptic Technique

2) Medical Aseptic Technique

Surgical aseptic technique – The CDC (2010) estimated that over 27 million surgical procedures are performed in the United States each year. Surgical site infections are the third most common hospital acquired infections and are responsible for longer hospital stays and increased cost to the patient and hospitals. The aseptic technique strictly applied in the operating room is the surgical asepsis because of the direct and often extensive disruption of skin and underlying tissue. This includes Hand washing, surgical scrub, gowning and donning of gloves. The most common source of pathogens that cause surgical site infection is the patient. While microorganisms normally colonise part in or on the human body without causing diseases, infection may result when this endogenous flora is introduced to tissues exposed during surgical procedures to reduce this risk, the patient is prepared by shaving hair from the surgical site; cleansing with a disinfectant containing such chemicals, iodine alcohol or chlorhexidine gluconate and applying sterile drape around the surgical site. Hand washing is an important step in asepsis A.O.R.N, (2002) stated that proper hand washing can be the most single most important measure to reduce the spread of microorganism, proper hand washing involves removal of jewelry avoidance of close contact with the sink and a minimum of 10-15 seconds of hand scrubbing with soap, warm water and vigorous friction, (Kathy, 2002; Bjerke,2003).

In general setting, hands are to be washed when visible soiled, before and after contact with patient, after contact with other potential sources of microorganism, before invasive procedures and after removal of clothes, alcohol scrub can be done if hand is not visibly soiled. Surgical scrub is performed by members of surgical team who will come into contact with the sterile field or sterile instruments and equipments (Cathy, 2000;AORN, 2002).This procedure require use of a long acting powerful antimicrobial soap on the hand and forearms for a longer period of time than used for typical hand washing.CDC (2010)recommended at least two to five minutes of scrubbing while thorough drying is essential , as moist surfaces invites the presence of pathogens, contact with other potential contaminants should be avoided. An important principle of aseptic technique is that fluid (a potential mode of pathogen transmission)

floors in the direction of gravity. With this in mind, hands are held below elbows during the surgical scrub and above elbows following the surgical scrub.

Despite the careful scrub, bare hands are always considered potential sources of infection, sterile surgical clothing or potential devices such as gloves, face masks, goggles and transparent eye / face shield serve as barriers against microorganism and are donned to maintain asepsis in the operating room and this practices includes covering facial hair, tucking hair out of sight , removing jewelry or other dangling objects that may harbor unwanted organisms.This ensures that potentially contaminated items such as hands and clothing remain behind protective barriers thus prohibiting in advertent entry of microorganisms into sterile areas.Donning sterile gloves requires specific technique so that the outer glove is not touched by the hand. A large cuff exposing the inner glove is created so that the gloves may be grasped during donning.Non sterile items should not be touched once sterile gloves are applied (Mangram, Teresa ,Michele ,Leah and William , 1999;Pittet, 2001). Any break in the glove or touching the glove to a none sterile surface requires immediate removal and application of new gloves.

Creating sterile surgical fields with drapes is another way of maintaining aseptic technique in the operating room or for other invasive procedure sterile surgical drapes are sterilized linen placed on the patient or around the field to the delineate sterile areas . Drapes or wrapped kits are open in such a way that the contents do not touch non-sterile items or surfaces, equipment and supplies also need to be handled properly. Surgical instruments scan be sterilized by chemical treatment, radiation,gas or heat. In the operating room proper preparation of the patient using an antimicrobial product prior to surgery is essential in reducing the number of microorganisms present on the patient's skin. Shaving is discouraged because it causes small nicks and breaks the skin where bacteria can grow and multiply. Health care workers needs to know that only sterile items are free of potential infections agents and once a sterile object comes in contact with a non-sterile object, surface or person or with dust or other air borne particles the object is no longer sterile(Catty, 2002;AORN, 2005).

Principles of aseptic technique

Principles applied to maintaining asepsis in the operating room which include.

- i. All item in a sterile field must be sterile
- ii. Sterile packages or fields are opened or created as close as possible to time of actual use.
- iii. Moist areas are not considered sterile
- iv. Contaminated items must be removed immediately from the sterile field.
- v. Only areas that can be seen by the clinicians are considered sterile (the back of the physician are not sterile).
- vi. Gowns are considered sterile only in the front from chest to waist and from the hands to slightly above the elbow.
- vii. Tables are considered sterile only at or above the level of the table.
- viii. Non sterile items should not cross above the level of the table.
- ix. There should be no talking, laughing, coughing or sneezing across a sterile field.
- x. Personnel's with colds should avoid working while ill or apply a double mask.
- xi. Edges of sterile areas or field (generally the outer inch) are not considered sterile.
- xii. When in doubt about sterility, discard the potentially contaminated item and begin again.
- xiii. A safe space or managing of safety is maintained between sterile and non-sterile objects and areas.
- xiv. When pouring fluids only the lip and inner cap of the pouring container is considered sterile; the pouring container should not touch the receiving container and splashing should be avoided.
- xv. Tears in barriers and expired sterilization dates are considered breaks in sterility (Mangram, Teresa, Michele, 1999; Cathy 2002; Kathy 2002; AORN, 2005; N.H.S, 2009; Gistarea ,2013).

Other clinical settings

In other clinical settings apart from the operating room, observation of medical aseptic practices will help to prevent hospital acquired infections; clinical areas outside the operating rooms generally do not allow for some strict level of asepsis, avoiding potential infections remains the goal in every clinical settings. The application of aseptic technique in this setting is termed medical asepsis or clean technique rather than surgical asepsis or sterile technique required in the operating rooms. Specific situations outside of the operating room as identified by NHS, (2009), Catty, (2012) that required strict application of aseptic technique include:

- i. Wound care
- ii. Drain removal or drain care
- iii. Intravascular procedures
- iv. Vaginal examinations during labour
- v. Insertion of Urinary Catheters
- vi. Respirator

A surgical dressing change at the bedside, though in a much less controlled environment than the operating room will still involve thorough hand washing, use of gloves and other protective garb, creation of sterile field, opening and introducing packages and fluids in such a way as to avoid contamination and constant avoidance of contact with non-sterile items. There are general habits as identified that help to preserve a clean environment. The safe removal of hazardous waste i.e. prompt disposal of contaminated needles or blood soaked bandages to containers reserved for such purposes:

- a. Prompt removal of wet or soiled dressings
- b. Prevention of accumulation of bodily fluid drainage.
- c. Avoidance of backward drainage flow toward patient
- d. Immediate cleaning up of soiled or moist areas.
- e. Labeling of all fluid containers with date, time and timely disposal per institutional policy.
- f. Maintaining seals on all fluids when not in use.

The isolation unit as identified by is another clinical setting that requires a high level of attention to aseptic technique. The severely Immuno compromised patient is placed in reverse isolation, where the goal is to avoid introducing any microorganisms to the patient. In cases like this aseptic technique is very important to avoid spread of infection in the hospital or injury to the patient unprotected by sufficient immune defenses. Entry and exit from the isolation unit involved careful hand washing, use of protective barriers like gowns, gloves and care not to introduce or remove potentially contaminated items. AORN, (2005) identified hand washing, wearing proper P.P.E, proper gloving, surgical prep as related actions that support aseptic technique.

Standard precaution practices

Standard principles according to Department of Health (DH) (2001) provide guidance on infection control precautions that should be applied by all health care workers to the care of all hospital in-patients all the time. These recommendations are not detailed procedural protocol and need to be incorporated into local guidelines. They are divided into four distinct intervention.

- i. Hospital environmental hygiene
- ii. Hand hygiene
- iii. The use of personal protective equipment
- iv. The use and disposal of sharps

Standard precautions are safety procedures and practices designed to reduce the risk of transmission of blood borne infections. It is a universal precaution established by the Centre for disease control and prevention (CDC) and the American dental association (ADA). In standard precaution, the level of protection against transmission of infection in the health care setting, the care and treatment of patients is highly recommended. The proper handling of body substances secretion, excretion, no-intact skin, dried blood and mucous membrane are also taken care of (Garner, Rajinder, Beljit, Indorgit, 2008;Gistareas, 2013).

Hospital environmental hygiene

Good hospital hygiene is an integral and important component of a strategy for preventing hospital – acquired infection. The hospital hygiene involves wide range of routine activities considered to be central to the prevention of HALs, (National Audit Office 1999;DH 2001).They include:Cleaning and decontamination, laundry and housekeeping, safe collection and disposal of general and clinical waste, kitchen and food hygiene. The hospital must be visibly clean, free from dust and soilage and acceptable to patients, their visitors and staff.Where a piece of equipment is used for more than one patient e.g. toilet, bath. It must be cleaned following each and every episode of use. Statutory requirement must be met in relation to the safe disposal of clinical waste launching arrangement offer used and infected linen, food hygiene and pest control. All staff involved in hospital hygiene activities must be included in education and training related to the prevention of hospital acquired infection, (DH, 2001;HPA, 2012).

Hand hygiene

Hand washing is one of the most important precaution measures against transmission or contamination of infections by health workers. The transmission of microorganisms from one patient to another via hands or from hands that have become contaminated from the environment can result in adverse outcomes. Primary exogenous infections are a direct clinical threat where microorganisms are introduced into susceptible sites such as surgical wounds, intravascular cannulation sites or catheter drainage systems. Secondary endogenous infection creates an indirect clinical threat where potential pathogens transmitted by the hands establish themselves as temporary or permanent colonizers of the patient and subsequently causes infection at susceptible sites, (WHO, 2007;HPA,2012).

Effective hand decontamination results in significant reduction in the carriage of potential pathogens on the hand and this logically decreases the incidence of preventable HALs leading to a reduction in patient morbidity and mortality as agreed by experts, (DH, 2001; Sax, Allegranzi, Uckay, Larson, Boyce, Pittet, 2007; WHO, 2007;HPA, 2012).According to Gistarea (2013), health workers should wash their hands before and after contact with any patient or any activity because the use of gloves is not good substitute for effective hand washing. The hand washing should be

done, before and after eating, before and after using glove, after contact with used equipment, before and after contact with patient and immediately after contact with patient.

When washing the hand a proper routine hand washing precaution should be taking by removing all jewellery on the hand, using cleaning solution with or without disinfectant and water for up to 20 seconds and dry with single use towel or disposable towel. It is advisable to wash and allow the hand to dry in the absence of disposable towel because general towels aid infection contamination, choosing the method of decontaminating hands will depend upon the assessment of what is appropriate for the episode of care, what is practically possible, available resources and to some degree, personal preferences based on the acceptability of preparation or materials. In general, effective hand washing with a liquid soap will remove transient micro organism and render the hand socially clean. This level of decontamination is sufficient for general social contact and most clinical care activities. The use of an anti microbial liquid soap preparation will reduce transient and resident flora and result in hand antisepsis (Larson 1995; Ward, Wilson, Taylor, Cookson and Gyan 1997).

The effective use of alcohol based hand rubs on contaminated hand will also result in substantial reduction of transient microorganisms, although alcohol is not effective at removing dirty and organic materials, (Ward, Wilson, Taylor, Cookson and Gyan 1997; HPA, 2012). However alcohol hand scrub, offer a practical and acceptable alternative to hand washing when the hand are not grossly soiled and are increasingly being recommended for routine use (Granner, Fayero 1985; Infection control Nurses Association (ICNA) 1999; DH, 2001; HPA, 2012).

The use of personal protective equipment

Personal protective equipment (PPE) is specialized clothing or equipment worn by an employee for protection against infectious materials. (CDC, 2012) .The protection of healthcare personnel from infection disease exposure in the workplace requires a combination of controls, one of which is the use of PPE. PPE listed below

prevent contact with the infectious agent or body fluid that may contain the infectious agent by creating a barrier between the worker and the infectious materials. Gloves protect the hand, gown or apron protect the skin and clothing masks and respirator protect the mouth and the nose, goggles protects the eyes and face shield protects the entire face.

Protective equipment should be selected based on the basis of an assessment of the risk of transmission of microorganisms to the patient, and the risk of contamination of health care practitioners, clothing and skin by patient's blood, body fluids, secretions and excretions. Durability and appropriateness of the PPE for the task should also be considered. The PPE must fit the individual user, is another factor to consider in the selection of PPE, it is up to the employee to ensure that all PPE are available in sizes appropriate for the workforce to be protected (CDC, 2012; NHMRC 2010; WHO 2007 DH, 2001).

Gloves

Gloves are the most common type of PPE used in healthcare setting. Expert opinions agree that there are two main indications for the use of gloves in preventing HAIs, (ICNA 2012; CDC 2012). To prevent health workers hand from contamination with organic matter and microorganism, and to reduce the risk of transmission of microorganisms to both patients and health workers. Gloves should be worn only when necessary as their prolonged and indiscriminate use may cause adverse reaction and skin sensitivity. Gloves should fit the users hand comfortably not too loose or too tight, they should not tear or damage easily. Unsterile gloves are either made of latex, nitrile or vinyl, however because of allergy concerns some facilities have eliminated or have limited latex product including gloves. The sterile gloves are worn by surgeons and other healthcare workers who perform invasive patient procedures.

Do's and don'ts of glove use as identified by CDC,(2012) are:

- 1 Health worker should work from clean to dirty.
- 2 Limits opportunities for touch contamination, protect yourself others and the environment

Don't touch your face or adjust PPE with contaminated gloves.

Don't touch environmental surfaces except necessary during patient care.

- 3 Change gloves – during use if torn and when heavily soiled (even during use on the same patient).
- 4 Discard in appropriate receptacle, never wash or reuse disposable gloves.

Gowns or aprons

There are three factors that influence the selections of gown or apron as PPE.

- i. The purpose of use. Isolation gowns are generally the preferred PPE for clothing but aprons occasionally are used where limited contamination are anticipated. If the contamination of the arm can be anticipated, a gown should be selected. Gown should cover the torso, fit comfortably over the body and have long sleeve that fit snugly at the wrist.
- ii. Materials properties of the gown. Isolation gown are made either of cotton or a spin synthetic material that dictate whether they can be laundered and reused or must be disposed. If fluid penetration is likely a fluid resistant gown should be used.
- iii. The third factor concern patients risks, whether clean or sterile gown can be used clean gown are used for isolation, sterile gowns are necessarily for performing invasive procedures, like in insertion of a central line.

Face Protections: These are materials use in protecting the face

- i. Masks – They should fully cover the nose and mouth and prevent fluid penetration. Masks should fit snugly over the nose and mouth. For this reason masks with flexible nose piece that can be secured to head with strings or elastic are preferable.
- ii. Goggles-They provide barrier protection for the eyes, which should fit snugly over and around the eyes.Goggles with anti-fog features will help maintain clarity of vision.
- iii Face shields – They protect face, nose mouth and eyes. They should cover forehead and extend below chin as well as wrap around side of face. They are

used as substitutes to mask and goggles in case of irrigation of wound or suctioning copious secretions.

Respiratory protection

Respirators that filter the air before it is inhaled should be used for respiratory protection. The most commonly used respirators in health care settings are the N95, N99 or N100 particulate respirators, this device has a sub-micron filter capable of excluding particles less than 5 microns in diameter. They are approved by CDC's National Institute for Occupational Safety and Health. In the selection of a respirator as PPE the nature of the exposure and risk involved must be considered. In using PPE, they are to be put on before contact with the patient, use carefully – so as not to spread contamination. Remove and discard carefully either at the doorway or immediately outside patient room, remove respirator outside room and immediately perform hand hygiene. The sequence for donning PPE as identified by CDC, (2012) are gown first, followed by mask or respirator then goggles or face shield and lastly gloves while the sequences for removing PPE is gloves first, followed by face shield or goggles followed by gown and lastly mask or respirator.

Health education and behavioural change

Health education and behavioural change are intertwined in the sense that the conduct of one leads to the attainment of the other. If the overall goal of health education is to help individuals to live healthy and have quality life through certain behaviours then it is difficult to draw a distinct line between the two. The continued occurrence of series of health problems such as HAIs over the years coupled with high level of poverty and literacy that are inimical to coping efforts in a developing world such as Nigeria call for a discipline like Health education. Udoh, Fawole, Ajala, Okafor and Nwana (1987) defined health education as a process as well as a programme concerned with human values and behaviors that are openly and subtly associated with such items as ecology and environmental wellbeing, nutrition, growth, mood modifying substance, consumer health, sexuality and the comprehensive treatment of major health problems of young people and adult.

Brieger (1996) defined health education as any combination of learning activities that promote voluntary adaptation in health and health related behaviours. Ademuwagun (1974) perceived health education as discipline of discipline because it derives its content and method from biological and physical sciences, social-cultural and behavioural sciences and pedagogical science –education methods and technique. He asserted that the focus of health education is on people and their health behaviour, he further affirmed that health education is a process of disseminating scientific knowledge of promoting positive health attitude and motivating desirable health practices. Moronkola (1999) submitted that health education is designed to instill in people the need for a healthy life for quality living that will ensure high productivity, teach people how to take care of their personal and community health, change people's attitude toward health to positive ones, change people negative health practices to positive ones, encourage people to use available health services, make people see the need for preventing diseases rather than spending more time and money for treatment, encourage people to continue with their local way of life that promotes health.

Aseptic technique training on cognition of health workers

Health care workers at the three levels of care have good awareness that patient could be a source of HAIs. However awareness of hospital staff on whether equipment and the environment can be sources of transmission of HAIs was also good among HCWS in both tertiary and secondary level of care but poor among primary HCWs, despite the fact that they are the frontline defense for applying daily infection control practices (Salah, Fayda Meshal, Gamal and Medhat 2012). In another study reported by Yeo-Sook and Nam-cho (2002) it was discovered that the group that receives education about universal precautions has a higher level of knowledge and performance of the universal precaution than the group that receives no such education. The education about universal precaution and aseptic technique is indispensable it is desirable to raise the relative importance for the curriculum of both nursing and medical colleges. The compliance regarding aseptic precaution was significantly better among nursing staff who had updated their knowledge during previous six months compared to those that did not in a study conducted among the

nursing staff at the National Hospital of Sri Lanka (NHSL) (Bataduwaarachchi, Balasubramaniam, Balasooriya, 2011).

Health workers have insufficient knowledge about evidence of the benefit of hand hygiene and the favourable self-image of compliance with hand hygiene rules means that it would take considerable effort to bring about any improvements in hand hygiene, (Offra, Usman, Endang, Djoko, Hencho, Nico Rozemarijin, Peterhans, 2010).Gadzama, Barra, Ajinoma, Saidu Usman, (2014) reported unsafe injection practice, the pattern which might in part be attributable to the fact that nearly one-fifth of the respondent had no on the job training on current injection policy and guidelines, and is consistent with the findings on needs assessment among some African countries (Umar, Olatunji, Abiola, Yakubu, Oche, 2011 ; Mutabaruka, 2003).Karani, Katswo, Muhani, Lwafama and Ntsekhe (1990) reported that a sizeable portion of the health workers researched on were knowledgeable of the recommended procedures in relation to aseptic technique in routine clinical procedures over 75%. They concluded that an integrated and comprehensive educational programme and periodic feedback among the health workers will be of utmost benefit.

Studies reveal that health workers that have continuous training and formal training have more knowledge and this influence their practices of aseptic technique (Aida, Pierlugi, Carmelo, Nobile, Claudia and Mania, 2013).Healthcare workers (HCWs) play pivotal roles in outbreak responses. Ebola virus disease (EVD) outbreak spread to Lagos, Nigeria, in July 2014, infecting 11 HCWs (case fatality rate of 45%). This study was conducted during the outbreak to assess HCWs' EVD-related knowledge and practices. Higher proportions of HCWs with good knowledge and training reported good practices. HCWs with EVD-related training were three times more likely to adopt good practices. Lagos State HCWs had good knowledge of EVD without a corresponding level of good practices. Training was a predictor of good practices(Oladimeji, Gidado, Nguku, Geneviene, Patil, Oladosu, Roberts, Waziri, Shuaib, Oguntimehin, Musa, Nasidi, Adewuyi, Olayinka, Odubanjo, Ponggensee, N-FELTP Residents ,2015).

Aseptic technique education toward attitude of health workers

According to Rokeach (1976), an attitude is the organisation of interrelated beliefs around a common object or situation with the focus of attention on the object being at the focus of attention for some other person and other aspects for other persons. Fishbein and Middlestadt (1987), in their submission reported that attitude towards performing a given behaviour is a function of both the person's salient belief that performing the behaviour will lead to certain outcome. The summary is that attitude is a function of beliefs and that there will always be a basis for holding certain attitude about any person, object or an issue and the fact is that such an attitude could be positive or negative depending on information and the belief held. Attitude held whether negative or positive will have its implication which could be desirable or undesirable. Studies have shown that health care workers have positive attitudes towards aseptic technique and use of standard precaution in the prevention of HAIs, (Parker and Goldman, 2006; Salah, Fayda, Meshal, Gamal and Medhat, 2012).

In a study reported by Jane (2012), it was discovered that despite national and international recommendations for good practices in infection prevention and control (IPC) compliance can be low, several reasons for this have been identified among which is the health care workers attitude who considered IPC as an additional workload burden as opposed to an integral aspect of patient safety and quality care especially among nursing students. Aida, et al, (2013) in their submission, confirmed that HCWs working in regional general hospital have positive attitude when practicing in ICU wards in the study appropriate knowledge was significantly related to positive attitudes.

In a study reported by Ariyanrathne et al, (2013) among nursing and medical students, participants have moderate knowledge but attitudes practices and satisfaction of facilities of all participants was overall poor. Offra, Usman, Ndang, Djoko, Hendro, Nico, and Rozemarijn (2010) in a study conducted among Indonesian health care workers with respect to infection control reported that significant positive correlations were found between knowledge, attitude, self reported behaviour and perceived obstacles. Gebru (2013) in a study conducted in North Ethiopia among HCWs confirmed that there is gap of knowledge, attitude and practice of HCWs toward safe injection practice and needle stick injury is highly prevalent in the study

area. Hence the need to advocate provision of short term refresher training to the health care professionals to prevent transmission of infection in clinical settings.

Work related risk reduction practices among health care workers

Risk management is a process consisting of a well defined steps which when taken in sequence support better decision making by contributing to a greater insight into risk and their impacts. It is as much about identifying opportunity as is about avoiding losses. By adopting effective risk management techniques that can help improve safety and quality business performance (SAI Global, 2003). As health care settings vary greatly in their day to day function, it is not possible to provide a one size fit all approach to risk management, it is essential for health care workers to be able to identify, analyze the potential risk of transmission that can occur (NHRMC, 2010). The risk management identification in the clinical context as it applied to HAIs.

- i. Avoid the risk - The best way to manage a risk is to avoid it. It is valuable to consider the following before performing a procedure by asking oneself the following question,
 - a) is the planned task intervention necessary?
 - b) Are there alternative procedure that would eliminate or minimize potential exposure of the patient or yourself and others to infectious agent e.g. Can antibiotics be given orally rather than intravenously
- ii. Identify the risks- When approaching a clinical task or duty it is useful to consider the risk of HAIs transmission in terms of when/ where/ why and how can they occur.
- iii. Analyse Risk - The identified risk associated with the task /duty needs to be analyzed.
- iv. Evaluate risk - The next stage requires assessment of whether the level of risk is acceptable or not acceptable.

- v. Treat the risk- At this stage all the information gathered from the analysis and evaluate on the risk of HAIs transmission is brought together to consider what action should be taken (NHRMC, 2010).

Matsumoto(2002) identified the role of health care workers in nosocomial infection transmission, the importance of hand washing in preventing such transmission. It is quite important to keep high level of compliance of hand washing in preventing HAIs. The risk reduction work related practices among health care workers include appropriate use of hand hygiene ,P P E ,disposal of sharps objects in the correct places , use of aseptic technique in health care workers various practices to help with reduction of risks in the health care workers work related practices. In a study by Bree –Williams and Waterman 1996 it was found out that not all nurses in the sample applied a simple aseptic technique in their various practices. The fact that there is a relationship between the standards of aseptic technique performance and the rise in hospital infection was suggested by DH, in 2004.

Gadzama, Bawa, Ajinoma Saida, and Usman(2014), in a study in main referral hospital in northeastern Nigeria reported poor knowledge in the practices of injection safety, recapping of needles which is one of the practices that contributes to needle stick injury was commonly practiced by the respondents unsafe therapeutic injection practices, findings are also similar to the one reported from (Perz, Thompson, Schaefer and Patel, 2010; China, Yan, Zhang, Chen, Zhang, Guan, 2006;). In addition to increasing the potential for patient’s infections, unsafe injection practices put providers themselves at the risk of needle stick injuries, effective hand hygiene can lower the prevalence of HAIs, Unfortunately, the prevalence of these infections, continues to rise and pose a challenge to healthcare providers (Ariyantne, et al, 2013).

Previous studies have shown that hand hygiene compliance among healthcare workers is generally low(WHO, 2009). Furthermore, many studies done to assess the knowledge compliance and reason for non-adherence to hand hygiene guidelines have found that compliance with hand hygiene protocols by healthcare workers (HCW) is poor, (Rumbaua, Yu and Pena 2001; Kennedy, Elward and Frazer

2004; Kennedy & Burnett 2011) due to so many reasons like heavy work load, high number of clinical procedures and skin condition of HCW. A significant difference was observed between medical and nursing students who had received formal training in hand hygiene as reported by Ariyantne et al. (2013). He further reported that the nursing staff with less than five years of experience, the practice of aseptic precaution was significantly better compared to group who had more experience hence the need for continuous training and practices. As far as care of surgical wounds and urinary intravenous catheterization were concerned, knowledge was frequently outdated only a minority of the respondent know that shaving before surgery does not protect against surgical site infection (Niel –Weise, Wille, Van den Broek, 2005).

Effect of gender on cognition, attitude and work related risk reduction practices

Studies have found out that women were more likely than men to attend infection control update session on human immuno deficiency virus HIV/ AIDS and use face masks and eye protection while men were more concerned about the financial burden of infection control costs (Mccarthy & Macdonal, 1996). To support this Osazuwa, Azodo, Ehizele and Obuekwe (2010) reported in their study that gender differences for three items of infection control namely hand hygiene (favoured by women) goggles (preferred by women) and protective clothing (favoured by men). Ajayi (2008) in a study earlier in Nigeria revealed that more female, than male dental personnel were regular wearers of protective eye wears, Mccarthy and Macdonald, (1996) also reported significant female compliance with the use of this barriers method in Canada. Studies have also shown that women wash their hand more than their male counterparts after patient contact and being a male is a risk factor for non-compliance with hand hygiene.

Adedigba, Ogunbodede, Fajewonyomi Ojo and Nadoo, (2005) reported that men were found to be more compliant with the universal cross- infection control principle than women in a study among dental professionals in Osun state, Nigeria. Another Nigeria – based study among dental professional revealed that men complied with waste disposal regulation than women in Ile- Ife (Pittet, 2001) in the use of vaccination to prevent HBV more women than men had been vaccinated against hepatitis B, previous study from Nigeria also showed similar statistically

insignificant gender delineation,(Sofola and Savage, 2006). Conclusively, to reduce the onset of HAIs, HCWS needs to identify risk in their various practices and follows guidelines to prevent the spread of HAIs.

Effect of years of experience on cognition, attitude and work related risk reduction practices

Devi and Tamang (2014) in a study conducted among health professional working in labour room in selected government hospital in Sikkim found out there was a significant association between knowledge on practice of aseptic technique during delivery with years of experience in labour room as seen by chi square value ($p < 0.05$). The knowledge regarding asepsis during delivery needs more emphasis, as lack of knowledge on practice of aseptic technique during delivery can increase the chances of puerperal sepsis leading to maternal death. The findings of the research suggest that retention of skills and knowledge quickly deteriorates if not used or updated regularly. Therefore, the research supports the importance of infection control strategies refresher courses on a regular basis.

Furthermore, another study among health professionals found out that there was Significant association found between the knowledge and the demographic variables of aseptic technique applied in nursing practice among staff nurses variables like Year of working experience (4.34). There was significant association found between the practices for (YES) and the demographic variables of aseptic technique applied in nursing practice among staff nurses. Findings revealed that there was significant association found between the practices and the variables like sex (3.88) and professional qualification (3.87) (Pankaj, Sujit, Myursing, Joshi, Ravi, Babasaheb, Kedar, Leena, Mhaske, Viraj and Sarika ,(2014). Lagos State HCWs had good knowledge of Ebola Viral Disease(EVD) without a corresponding level of good practices. It was found out that training was a predictor of good practices, while higher proportions of HCWs with good knowledge and training reported good practices it was concluded that HCWs with EVD-related training were three times more likely to adopt good practices (Oladimeji et al 2015).

Appraisal of reviewed literature

Literature reviewed in relation to the study include those that have to do with the concept of aseptic technique, infection in hospital settings, risk reduction practices among community health workers and the need for aseptic training among community health care workers. The summary of the literature reviewed is that hospital acquired infections is on the increase in our hospital settings and the continuum of health care wherever health services is rendered and this pose a threat to health workers as well as patients being attended to if proper aseptic techniques are not adhere to and to reduce the onset of HAIs health workers need to identify risk in their various practices and follow proper procedures to prevent the spread of hospital acquired infections.

In most of the literature reviewed cognition, and attitude was found to be positively related to aseptic technique practices among health workers. Also gender, years of experience and geographical location were revealed to constitute significant determinants of health workers practices of aseptic technique. Due to scientific discoveries on daily basis and knowledge that is not static and increase in HAIs, literature suggest aseptic technique training as health workers whose knowledge were updated perform better in aseptic practices than health workers who are not and are less prone to infection in the health care settings. HAIs is more among health workers than the general populace and the health workers are more affected when there is outbreak of infections as they are always on the frontline of daily infection prevention practices. The reviewed of literature on aseptic training seems to suggest that health workers working at the community level, (the primary health centres) are being neglected with regards to aseptic technique training. The few research report related to aseptic technique training were descriptive studies among health workers where aseptic techniques training were recommended to improve aseptic technique practices among health care workers as increase in hospital acquired infection is on the increase and poses great dangers to patients, health workers and the community respectively.

However, it is obvious that health education is useful in empowering people to make informed decision about those things affecting their health with a view to promoting healthy life. It is also one of the interventions available to the health provider to meet specific objectives of achieving a change in behaviour in specific term, health education can be developed to promote change in behaviours with respect to a giving problem like HAIs. Aseptic technique education, if well packaged and

implemented to educate help HCWs to have a veritable strategy in achieving the goals of such intervention for individuals and group to have better health status. They must be health informed and well empowered in using health information they have acquired to exhibit positive health attitude and behaviours .This study therefore wants to employ aseptic technique education in various sessions to increase the knowledge of community health workers targeted for this study to promote positive attitude and behaviours about HAls prevention.

CHAPTER THREE

METHODOLOGY

This chapter discusses the method and procedures for the study. The chapter was discussed under design, population of the study, sample and sampling technique, instrumentation and procedure for data analysis.

Research Design

The nonequivalent pretest-posttest control groupquasi-experimental research design was used for this study. The design was considered appropriate because the experimental group and control group were not equal in number and participants for the study were assigned to treatment and control groups. The design also gave room for comparison between the experimental and control group to determine whether the intervention had impact on the performance of the experimental group. The design is schematically represented:

$O_1 X_1 O_3$ Experimental group (aseptic technique education intervention)

$O_2 X_2 O_4$ Control

Where O_1 and O_2 are pretest observation for the experimental group and control group respectively.

O_3 and O_4 are posttest observations for the experimental group and control group respectively.

X_1 treatment programme (aseptic technique education intervention)

X_2 control (maternal and child health education)

The study made use of a 2x2x2 factorial matrix for the analytical part which is represented in the table 3.1:below:

Treatment	Gender	Years of working experience
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Aseptic technique education intervention (T)	Male	Short(1 <10)
	Female	Long(> 10 yrs)
Maternal and child health education(C)	Male	Short (1 <10)
	Female	Long (> 10 yrs)

Population

The population of this study consisted of all community health workers, (two thousand five hundred and fifteen (2515) working in the Primary Health Care Facilities in Oyo state.

Sample and sampling technique

Three hundred (300) male and female community health workers volunteers working in Oyo state who filled a consent form participated in the study.

Multistage sampling procedure was adopted for the study through the following stages

Stage 1 – Simple random sampling technique of fish bowl without replacement was used to select Ogbomoso and Ibadan health zones out of five health zones in Oyo state. The remaining zones are Oyo, Ibarapa and Oke ogun health zones respectively.

Stage 2- Simple random sampling technique of fish bowl without replacement was used to select Ibadan health zone for experimental group and Ogbomosho health zone for control group.

Stage 3- Proportionate sample of 20% of health workers was selected in both control (65) and experimental group (235) respectively.

Multistage sampling was also used to select participants for interview

Stage 1- Simple random sampling technique of fish bowl without replacement was used to select 2 LGAs from experimental group and 2 LGAs from control group to pick senior staff for interview.

Stage 2- Purposive sampling technique was used to select one facility each with highest turn out per LGAs and the head of each facility were interviewed.

Table 3.2: Number of Local Governments in Ibadan/Ogbomoso Health Zone of Oyo State

S/N	Names of the LGAs in Ibadan and ogbomoso Health Zones	No of health workers	20% of the total no	Selected health facilities for interview
1	Ibadan North LGA	115	23	
2	Ibadan North EastLGA	134	27	
3	Ibadan South East LGA	114	23	Agbongbon PHC
4	Ibadan South West LGA	99	20	
5	Ibadan North West LGA	88	19	Oniyanrin PHC
6	Akinyele LGA	90	18	
7	Egbeda LGA	89	18	
8	Oluyole LGA	125	25	
9	Lagelu LGA	105	21	
10	Ona ara LGA	94	19	
11	Ido LGA	105	21	
	Ogbomoso health zones		235	
12	Ogbomoso North	68	14	
13	Ogbomoso South	66	13	Adebayo Alata PHC
14	Surulere LGA	69	14	Iresaadu PHC
15	Orire LGA	62	12	
16	Ogo oluwa	66	13	
Total	16	1489	65 300	4

Source: Administrative office in the local governments' areas, 2016.

Inclusion and exclusion criteria

The study enrolled 300 participants, who volunteer and who signed the consent form. Health care workers who are not working in the clinical area of the facilities were excluded.

Research instrument

Three self-developed research instruments were used for the study (Questionnaire, interview guide and Aseptic Technique Education Package). Aseptic Technique Education Questionnaire (ATEQ) had three sub-scales which are Cognition of HAIs Reduction Practices Questionnaire (CHRPQ), Attitude towards HAIs Reduction Practices Questionnaire (AHRPQ) and Work Related Risk Reduction Practices Questionnaire (WRRRPQ) to elicit information on the variables of the study. The interview guide which was used to elicit information from head of facilities of primary health centers on the variables of study.

Aseptic Technique Education Package for health workers a direct instructional package comprised principles of aseptic technique when bypassing skin barriers, safety of health care work environment, information on the selection and use of personal protective equipment (PPE) in health care settings and practice on how to safely put on and remove PPE. Work risk reduction practices contained information on proper disposal of sharps, decontamination, injection safety, hand hygiene and sterilisation.

Validity of research instrument

To ensure the instrument measures what is was designed to measure, copies of draft questionnaire was made available for criticism and also subjected to the critique of the researcher's supervisor and other experts in the Department of Human Kinetics and Health Education, Department of Nursing, University of Ibadan, Ibadan, as well as lecturers in other related disciplines for content and construct validity. Their comments, suggestions and modifications were studied carefully and made use of for improving the quality of the instruments in relation to research questions and hypotheses.

To ascertain the validity of the instruments in this study, seventy- two items were generated based on explorative survey discussion with some health workers working at the community level after which the questionnaire was presented to two professional health educators and an expert in psychometrics. This led to subtraction, addition and modification of the items of the questionnaire, leaving the questionnaire with (65) items. This was then subjected to exploratory factor analysis. A Kaiser-Meyer-Olkin (KMO) of 0.70 was obtained which is above the bench marks of 0.60. This indicated that the sample size was adequate for the conduct of factor analysis. At the end, only (53) of the items were able to meet up with the retention criterion of 0.6, all other items that did not meet the retention criterion were extracted.

Reliability of research instrument

Reliability refers to the accuracy of data in relation to stability, repeatability and precision (Idowu, 2005). An instrument is reliable when it is persistent in measuring correctly, what it is supposed to measure with the result remaining the

same when administered in a similar situation. The instrument was administered on a sample of twenty (20) community health workers from Oyo state that will not be part of the sample for the study. The data was collected and analyzed using Chronbach Alpha to test the internal consistency ofCHRPQ,AHRPQ and WRRRPQ. Thescale yielded reliability values of $r=0.70$. $r=0.85$ and $r=0.78$ respectively,the instruments met the Nunnally criterion of $r=0.70$ which is expected of any psychometric measures.

In-depth interview guide

The interview guide (qualitative research instrument) contained four (4) question items and two (2) probes questions. The instrument was used to elicit further information in line with the tested variables. The generated items were reacted to by the respondents that were used for the pre- testing of the instrument. The consistency of the respondent's responses was established. The method was carried out by interviewing respondents. The generated data (through transcribing) were then subjected to thematic content analysis in which two (2) research assistants and the researcher read and analysed the same set of transcript and later compared the notes. It was found out that the notes were in agreement; hence the items were considered reliable.

Field testing of instrument

Field testingof the instrumentswas carried out before the actual study among 20 community health workers inOyo East local government in Oyo state who are not part of the sample for the study. Apart from helping to determine the reliability of the instruments, the process helps to assess the feasibility of the study. This acquaints the researcher with the procedures and problems that may be encountered during the actual study.

Ethical consideration

Ethical approval was obtained from the Chairman, Social Science and Humanities Research Ethic Committee (SSHEC) of University of Ibadan in conjunction with Collaborative Institutional Training Initiative (CITI PROGRAM). The researcher presented copies of her research proposal, consent form and some other information

on the researcher. The proposal was reviewed and the researcher was asked to make some corrections. After submitting the corrected copy, a full approval was given with assigned number: UI/SSHEC/2016/0044. The researcher also made the participants to sign informed consent form and assured them of their safety and confidentiality.

Procedure for data collection

The researcher collected a letter of introduction from the Head, Department of Human Kinetics and Health Education, University of Ibadan. The letter was presented to each local government medical officer of health and primary health care coordinators of each Local Government Area where participants were drawn from to enable the researcher to have access to the respondents. Informed consent of both experimental and control group was sought for by the researcher.

Interview guide was developed to elicit information from senior officers working in the facilities with high client flow; interview guide was used to collect information that was analysed. Adequate arrangement was made with resource person on date, time and venue of the programme. Research assistants were employed and trained on the purpose of the study and how to collect data. The validated and reliable questionnaire was administered to the participants on first day after formal welcome, introduction at the training venue (Agbongbon PHC hall, Agbongbon, Ibadan), it was retrieved on completion of filling (pretest), and the treatment (Aseptic technique education package) was presented. Punctuality, contributions and active participation at sessions was commended during the programme. The copies of the questionnaire were administered on completion of intervention programme at the end of ten weeks (post test).

The control group was also made to undergo pretest and post test at venue different from experimental group (Comprehensive Model Centre, Sunsun, Ogbomoso). However, the control group was not exposed to the treatment nor have access to the training materials (Aseptic technique education package), they were on placebo of maternal and child health education package, and the giving intervention spanned ten (10) weeks.

Treatment procedure for participants in experimental group, using aseptic technique education package

The following steps were followed:

Session 1

Topic: Administration of pre-test instrument

The purpose of this session is to administer the questionnaire on the participants so as to determine the ability of the health workers who will benefit from the training.

Activity:

- i. The researcher familiarised with the member of the group and welcomed them warmly into the programme. The participants were informed that they will be having 10 sessions of 2 hours each for a period of 10weeks.
- ii. The researcher explained the reason for the programme and what the participants stand to benefits at the end of the programme.
- iii. The researcher explainedthe rule guiding the conduct of the programme and what was expected of the participants.
- iv. The researcher administered the pre-test instruments to the participants.
- v. As a take home assignment, the participants were asked to read about the term hospital acquired infections.

Concluding remarks

- i. The researcher commended the participants for their time and effort and encouraged them to do their home work
- ii. The participants were reminded of the time and venue for next session.

Session 2

Topic:Hospital Acquired Infections/ Healthcare associated infections

Objective: at the end of the session. The participant should be able to:

- i. Explain what hospital acquired infections is
- ii. Identify two forms of hospital acquired infections
- iii. Explain the method of infection prevention

Activity

- i. The participants were welcomed warmly
- ii. The researcher reviewed the assignment with the participants
- iii. The researcher also explained to the participants what hospital acquired infection is as well as two forms of hospital acquired infections. The researcher also explained method of infection prevention
- iv. As a take home assignment, the participants were asked to write out what they understand by the term hospital acquired infections

Concluding remarks

- i. The researcher commended the participants for their cooperation.
- ii. The participants were reminded to do their homework.
- iii. The participants were intimated with the time and venue for the next session

Session 3

Topic: Importance of infection prevention and control

Objective: At the end of the session, the participants should be able to:

- i. Explain the importance of infection prevention and control
- ii. Identify risk management towards infection prevention among health workers

Activity:

- i. The participants were welcomed warmly
- ii. The researcher reviewed the assignment with the participants
- iii. She also explained to the participants the various benefits of infection prevention and control. The researcher made the participants to know that they stand to benefit a lot as far as their health is concern when they prevent and control infection in their places of work.
- iv. The researcher explained the steps of risk management towards infection prevention among health workers.
- v. As a take home assignment, the participants were asked to write out the importance of infection prevention and control

Concluding remarks

- i. The researcher commended the participants for their cooperation.
- ii. The participants were reminded to do their homework

- iii. The participants were intimated with the time and venue for the next session

Session 4

Topic: Injuries and work related risk reduction practices

Objectives: At the end of the session, the participants should be able to:

- i. Explain how injuries commonly occurs and how to prevent injuries due to sharps
- ii. Explain how to reduce the risk of transmitting infections between clients.

Activity

- i. The participants were welcomed warmly
- ii. The researcher reviewed the assignment with the participants
- iii. She also explained to the participants how injuries commonly occurs, how to prevent the injuries due to sharps, how to administer injection safely without injuring themselves and the patient, how to reduce the risk of transmitting infections between clients wasdiscussed and practicalised as this also go a long way to prevent transmission to the health workers also.
- iv. As a take home assignment, the participants were asked to write out what they know about common injuries and work related risk reduction practices.

Concluding remarks

- i. The researcher commend the participants for their cooperation
- ii. The participants were reminded to do their homework
- iii. The participants were intimated with the time and venue for the next session

Session 5

Topic: House keeping

Objectives: At the end of the session, the participants should be able to:

- i. Explain the meaning of housekeeping
- ii. Role of housekeeping in infection prevention
- iii. General housekeeping guidelines

Activity

- i. The participants were welcomed warmly

- ii. The researcher reviewed the assignment with the participants
- iii. She also explained to the participants what housekeeping means as the purpose is to reduce the number of microorganisms in the facility, thereby reducing clients and health care workers exposure to infections. The importance and the general housekeeping guidelines will be discussed as it goes a long way to prevent infections in the health setting.
- iv. As a take home assignment, the participants were asked to write out what they understand by the term housekeeping.

Concluding remarks

- i. The researcher commended the participants for their cooperation
- ii. The participants were reminded to do their homework
- iii. The participants were intimated with the time and venue for the next session

Session 6

Topic: Standard precaution and aseptic technique

Objectives: At the end of the session, the participants should be able to:

- i. Explain the meaning of standard precaution
- ii. Explain the meaning of Aseptic technique
- iii. Identify the difference between standard precaution and aseptic technique

Activity

- i. The participants were welcomed warmly
- ii. The researcher reviewed the assignment with the participants
- iii. She also explained to the participants what standard precaution means as the purpose is to reduce the number of microorganisms in the facility as it provide guidance on infection control precautions that should be applied by health care workers, thereby reducing clients and health care workers exposure to infections. Aseptic deals with sterility and is made use of when health workers engage in procedures that bypass the skin integrity. Standard precaution assists in the process of aseptic techniques.
- iv. As a take home assignment, the participants were asked to write out what they understand by the term standard precaution and aseptic techniques.

Concluding remarks

- i. The researcher commended the participants for their cooperation
- ii. The participants were reminded to do their homework
- iii. The participants were intimated with the time and venue for the next session

Session 7

Topic: Aseptic technique

Objectives: at the end of the session, the participants should be able to:

- i. Identify types of aseptic technique
- ii. Explain the principles of Aseptic technique

Activity

- i. The participants were welcomed warmly
- ii. The researcher reviewed the assignment with the participants
- iii. She also explained to the participants types of aseptic technique, the type that is being practice at the community level and the principles of aseptic techniques applicable to both types of aseptic techniques.
- iv. As a take home assignment, the participants were asked to write out what they understand by the term principles of aseptic techniques.

Concluding remarks

- i. The researcher commended the participants for their cooperation
- ii. The participants were reminded to do their homework
- iii. The participants were intimated with the time and venue for the next session

Session 8

Topic: Aseptic technique procedure in clinical settings (medical asepsis)

Objectives: At the end of the session, the participants should be able to:

- i. Explain the meaning of medical asepsis
- ii. Explain decontamination and sterilization

Activity

- i. The participants were welcomed warmly
- ii. The researcher reviewed the assignment with the participants

- iii. She also explained to the participants what medical asepsis is. What decontamination and sterilization procedures entail and how to make a chlorine solution for decontamination, the benefit of this procedure was explained as they are procedure to be done on daily bases in an healthcare setting to prevent infection.
- iv. As a take home assignment, the participants were asked to write out what they understand by the term medical asepsis, decontamination and sterilization

Concluding remarks

- i. The researcher commended the participants for their cooperation
- ii. The participants were reminded to do their homework
- iii. The participants were intimated with the time and venue for the next session

Session 9

Topic: High level disinfection (HLD)

Objectives: At the end of the session, the participants should be able to:

- i. Explain the meaning of high level disinfection
- ii. Identify the steps in HLD
- iii. Explain how to store processed equipment and instruments.

Activity

- i. The participants were welcomed warmly
- ii. The researcher reviewed the assignment with the participants
- iii. She also explained to the participants what high level disinfection means, the steps involved and the benefits of following the step appropriately to achieve the aim of asepsis in infection control, the steps involved in the storage of instruments to maintain their sterility pending the time they will be used.
- iv. As a take home assignment, how will you rate your use of aseptic technique?how do you plan about making use of appropriate techniques.

Concluding remarks

- i. The researcher commends the participants for their cooperation
- ii. The participants were reminded to do their homework
- iii. The participants were intimated with the time and venue for the next session

Session 10

Topic: Overall Review

Objectives: At the end of the session, the participants should be able to:

- i. Learn from their past mistakes in the area of common injuries and use of aseptic techniques and correct them.

Activity

Step 1: The participants were welcomed warmly and together with the researcher, home work of the last meeting was reviewed.

Step 2 :The use of PPE and aseptic technique of the participants was evaluated

Step 3: The participant were also encouraged to have positive attitude to the use of aseptic techniques in their daily activities in the hospital setting.

Step 4: Overall review, Post- Experiment Test Administration and Conclusion

The participants were administered post-test instruments. This was an interactive session between the researcher and the participants to ascertain the effect of the therapeutic programme. Activities of the previous sessions were role played to be sure they have attained positive experience via the intervention.

The researcher then thanked the participants for their cooperation and they were appreciated for their participation in the training programme.

Closing remarks

- i. The researcher commended the participants for their un-relenting cooperation
- ii. The participants were encouraged to utilize effectively the skills they have acquired via the intervention programme.

Control group

Session 1

Topic: Administration of pre-test instrument

Objective: To administer pre-test instrument to the participants

Activity: The researcher familiarised with the members of the group and explained to the participant that the programme is mainly for research purpose and that their support and cooperation is solicited for. The pre-test was administered on the participants.

Concluding remarks

The researcher commended the participants for their time and effort.
The participants were reminded of the time and venue for next session

Session 2

Topic: Maternal and Child Health

Objective: at the end of the session. The participant should be able to:

- i. Explain what maternal and child health is
- ii. Identify importance of maternal and child health
- iii. Explain three out of the importance of maternal and child health

Activity

- i. The participants were welcomed warmly
- ii. The researcher reviewed the assignment with the participants
- iii. The researcher also explained to the participants what maternal and child health is as well as the importance of maternal and child health which were listed out and explained.
- iv. As a take home assignment, the participants were asked to write out what they understand by the term maternal and child health.

Concluding remarks

- i. The researcher commended the participants for their cooperation.
- ii. The participants were reminded to do their homework.
- iii. The participants were intimated with the time and venue for the next session

Session 3

Topic: Maternal Health and Maternal Problems

Objective: At the end of the session, the participants should be able to:

- i. Explain the meaning of maternal health
- ii. Identify the problems associated with maternal health

Activity:

- i. The participants were welcomed warmly
- ii. The researcher reviewed the assignment with the participants

- iii. She also explained to the participants what maternal health is and the problem associated with it. The researcher guide the participants to proffer solution to the problem identified

Concluding remarks

- i. The researcher commended the participants for their cooperation.
- ii. The participants were reminded to do their homework
- iii. The participants were intimated with the time and venue for the next session

Session 4

Topic: Maternal Mortality and Morbidity

Objectives: At the end of the session, the participants should be able to:

- ii. Explain what maternal mortality and morbidity is
- iii. Explain Major causes of maternal mortality and morbidity

Activity

- i. The participants were welcomed warmly
- ii. The researcher reviewed the assignment with the participants
- iii. She also explained to the participants what maternal mortality and morbidity is, while infection, hemorrhage, puerperal sepsis, hepatitis and sexually transmitted diseases are identified as the major causes of maternal mortality.
- iv. As a take home assignment, the participants were asked to write out what they know about major causes of maternal morbidity.

Concluding remarks

- i. The researcher commend the participants for their cooperation
- ii. The participants were reminded to do their homework
- iii. The participants were intimated with the time and venue for the next session

Session 5

Topic: Major causes of maternal morbidity

Objectives: At the end of the session, the participants should be able to:

- i. Identify major causes of maternal morbidity
- ii. Explain the meaning of obstructed labour, vesico vaginal fistula
- iii. Hypertensive disorder of pregnancy, Abortion and female genital mutilation

Activity

- i. The participants were welcomed warmly
- ii. The researcher reviewed the assignment with the participants
- iii. She also explained to the participants what the major causes of maternal morbidity are which are obstructed labour, vesico vaginal fistula, abortion and female genital mutilation. The ways to manage this problem and prevent the occurrence among pregnant women were identify.
- iv. As a take home assignment, the participants were asked to write out what they understand by the term maternal morbidity.

Concluding remarks

- i. The researcher commended the participants for their cooperation
- ii. The participants were reminded to do their homework
- iii. The participants were intimated with the time and venue for the next session

Session 6

Topic: Maternal health Services

Objectives: At the end of the session, the participants should be able to:

- i. Explain the meaning of maternal health services
- ii. Explain the components of maternal health services
- iii. Identify the four elements that are essential to maternal death prevention

Activity

- i. The participants were welcomed warmly
- ii. The researcher reviewed the assignment with the participants
- iii. She also explained to the participants what maternal health services are, as this will promote maternal health of child bearing age woman. The components and four elements involved where examined.
- iv. As a take home assignment, the participants were asked to write out what they understood by the termfamily planning, pre natal care , delivery and post natal care services.

Concluding remarks

- i. The researcher commended the participants for their cooperation
- ii. The participants were reminded to do their homework

- iii. The participants were intimated with the time and venue for the next session

Session 7

Topic: Post natal care

Objectives: at the end of the session, the participants should be able to:

- i. Identify objectives of post natal clinic
- ii. Explain the meaning of post natal care

Activity

- i. The participants were welcomed warmly
- ii. The researcher reviewed the assignment with the participants
- iii. She also explained to the participants what post natal care entail and the objectives of post natal clinic was identified and explained.
- iv. As a take home assignment, the participants were asked to write out what they understand by the term child care services.

Concluding remarks

- i. The researcher commended the participants for their cooperation
- ii. The participants were reminded to do their homework
- iii. The participants were intimated with the time and venue for the next session

Session 8

Topic: Child health care

Objectives: At the end of the session, the participants should be able to:

- i. Explain the meaning of child health care
- ii. Explain the preventable diseases among children

Activity

- i. The participants were welcomed warmly
- ii. The researcher reviewed the assignment with the participants
- iii. She also explained to the participants who a child is, the health care given to a child that prevent diseases among children of less than 18 yrs. History taking and physical examination is to be done at every visit to the clinic.
- iv. As a take home assignment, the participants were asked to write out what they understand by the term Expanded programme on immunization (EPI)

Concluding remarks

- i. The researcher commended the participants for their cooperation
- ii. The participants were reminded to do their homework
- iii. The participants were intimated with the time and venue for the next session

Session 9

Topic: Expanded Programme on Immunisation (EPI)

Objectives: At the end of the session, the participants should be able to:

- i. Explain the meaning of EPI
- ii. Identify the schedule of immunization for babies
- iii. Explain how to prevent the child from being infected.

Activity

- i. The participants were welcomed warmly
- ii. The researcher reviewed the assignment with the participants
- iii. She also explained to the participants what expanded programme on immunization is all about, the meaning of immunization. Types of vaccine and what infant diseases they prevent from occurring
- iv. As a take home assignment write briefly what you gained in the last nine weeks.

Concluding remarks

- i. The researcher commends the participants for their cooperation
- ii. The participants were reminded to do their homework
- iii. The participants were intimated with the time and venue for the next session

Session 10

Topic –Administration of post-test at the 10th week

Objectives: Administration of post-test instrument

Activity: The post –test instrument was administered after which the researcher discussed the issue of maternal and child health as important to the existence of our nation. If there is decrease in infant and maternal mortality and morbidity rates this will affect all spheres of life. As health workers they were challenged on the need to arise to work for the benefit of clients and the nation generally. The researcher then

thanked the participants for their cooperation and they were appreciated for their participation in the training programme.

Concluding remarks

The researcher commended the participants for their time and effort.

Procedure for Data Analysis

Data from research instruments was collated and analysed using Descriptive statistics of frequency counts, pie charts and percentages were used to analyse the demographic information of the respondents and to provide answers to the research questions while inferential statistics of Analysis of Covariance (ANCOVA) was used to test all hypotheses at 0.05 alpha level.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND DISCUSSION OF FINDINGS

This chapter focused on the analysis of data with respect to research questions and hypotheses earlier stated. The chapter is divided into two (2) sections. Section A presented the demographic information of the respondents while section B provided the result of the tested hypotheses.

Section A: Demographic information of the participants

Table 4.1: Distribution of participants according to selected demographic characteristics

Gender	Frequency	Percentage
Male	39	13.0
Female	261	87.0
Total	300	100.0
Age		
Less than 25years	16	5.3
25-29years	49	16.3
30-34years	68	22.7
35-39years	102	34.0
40-44years	43	14.3
45years and above	22	7.3
Total	300	100.0
Marital status		
Married	232	77.3
Single	31	10.3
Separated	12	4.0
Divorced	13	4.3
Single parent	6	2.0
Widowed	6	2.0
Total	300	100.0
Religion		
Christianity	181	60.3
Islam	112	37.3
Traditional	7	2.3
Total	300	100.0
Years of working experience		
Less than 5years	32	10.7
5-9years	86	28.7
10-14years	103	34.3
15-19years	56	18.7
20years and above	23	7.7
Total	300	100.0

Table 4.1 above shows that out of the 300 respondents, 39 (13.0%) were male while 261 (87.0%) were female showing that majority of the respondents are female. The table also revealed that 16 (5.3%) less than 25years of age, 49 (16.3%) were between the ages of 25 and 29years, 68 (22.7%) were between the ages of 30 and 34years, 102 (34.0%) were between the ages of 35 and 39years, 43 (14.3%) were between 40 and 44years while 22 (7.3%) were 45years and above showing that majority of the respondents were between the ages of 35 and 39years. On marital status 232 (77.3%) of the respondents were married, 31 (10.3%) were single, 12 (4.0%) were separated, 13 (4.3%) were divorced, 6 (2.0%) were single parent while 6 (2.0%) were widowed,

showing that majority of the respondents were married. Concerning religion, 181 (60.3%) were Christian, 112 (37.3%) were Muslim while 7 (2.3%) were traditional worshipper, showing that majority of the respondents were Christian. This table also revealed that 32 (10.7%) had less than 5years of working experience, 86 (28.7%) had between 5 and 9years, 103 (34.3%) had between 10 and 14years, 56 (18.7%) had between 15 and 19years while 23 (7.7%) had 20 and above years of working experience showing that majority of the respondents had between 10 and 14years of working experience.

This section provided answers to the research questions:

Research question 1: What do community health workers in Oyo State perceived as the predominant cause of hospital acquired infection?

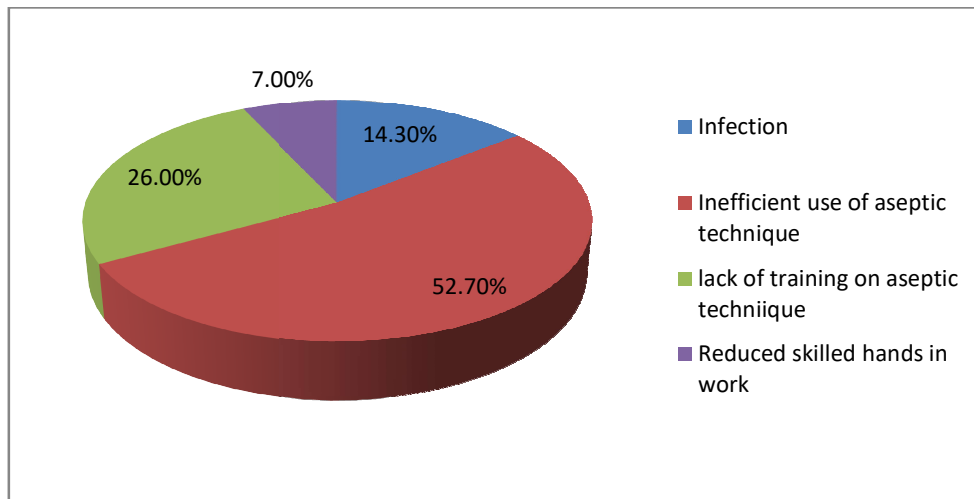


Fig. 4.1: Pie chart showing predominant cause of HAI

The chart above revealed that 43 (14.3%) attributed the cause of HAI to infection, 158 (52.7%) attributed it to inefficient use of aseptic technique, 78 (26.0%) attributed it to lack of periodic training on aseptic technique while 21 (7.0%) attributed it to reduced skilled hand in work places. This shows that majority of the participants attributed the cause of HAI to inefficient use of aseptic technique.

Research question 2: What are the reasons why health workers do not make use of aseptic technique?

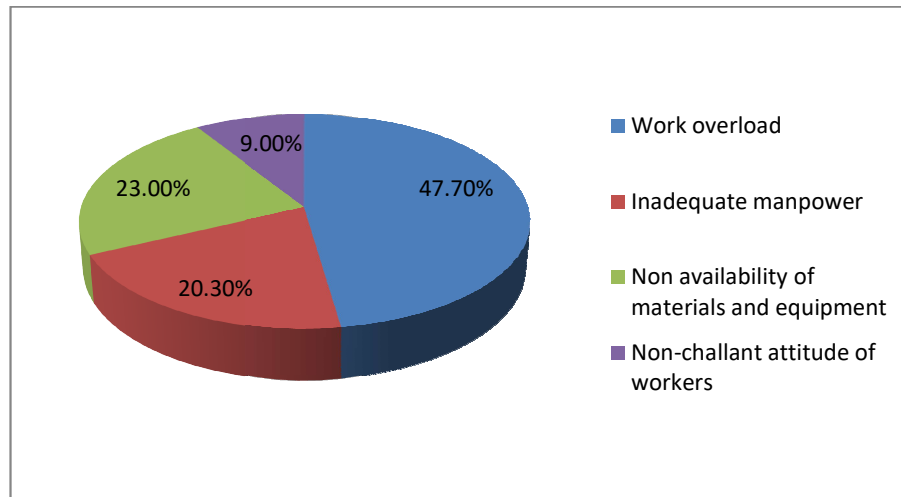


Fig. 4.2: Pie chart showing reasons why health workers do not use aseptic technique

The chart above revealed that 143 (47.7%) attributed the inadequate use of aseptic technique to work overload, 61 (20.3%) attributed it to inadequate manpower, 69 (23.0%) attributed it to non availability of materials and equipment while 27 (9.0%) attributed it to non-challant attitude of workers. This shows that majority of the participants attributed the inadequate use of aseptic technique to work overload.

Section B

Hypotheses testing

This section presented the results of the tested hypotheses

Ho 1a: There will be no significant main effect of treatment on health workers cognition of risk reduction practices towards infection in Oyo State.

Table 4.2: Summary of result showing the effects of treatment, gender and years of working experience on health workers cognition, attitude and work related risk reduction practices towards infection in Oyo State, Nigeria

Tests of Between-Subjects Effects							
Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Cognition post	8595.337 ^a	7	1227.905	27.576	.000	.398
	Attitude post	1808.824 ^b	7	258.403	12.260	.000	.227
	Practice post	12864.184 ^c	7	1837.741	49.355	.000	.542
Intercept	Cognition post	39076.734	1	39076.734	877.585	.000	.750
	Attitude post	24641.415	1	24641.415	1169.137	.000	.800
	Practice post	38926.237	1	38926.237	1045.413	.000	.782
Treatment	Cognition post	1999.278	1	1999.278	44.900	.000	.133
	Attitude post	309.986	1	309.986	14.708	.000	.048
	Practice post	4269.876	1	4269.876	114.673	.000	.282

The results presented in Table 4.2 showed that there was a significant main effect of treatment on cognition of aseptic technique ($F_{(1,292)} = 44.90, p < .005, \eta^2 = .133$). This implies that the treatments contributed significantly to the variation in participants' scores on cognition of aseptic training. The eta value of .133 shows that the treatments had a contribution of about 14% to cognition of aseptic techniques of the participants.

Table 4.3a: Adjusted marginal mean showing the direction of difference in cognition of aseptic technique among the groups

Dependent variable	Groups	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Cognition of aseptic technique	Control	19.972	1.596	16.831	23.114
	Treatment	31.649	.699	30.273	33.024

Table 4.3a showed that participants in treatment group obtained a higher mean score (31.649) than the participants in control group who had a mean score of (19.972). This shows that participant in treatment group performed better than the participant in the control group. It then means that the treatment had effect on cognition of aseptic technique among the participants.

Ho 1b: There will be no significant main effect of treatment on attitude among health workers in Oyo State, Nigeria

The results presented in Table 4.2 showed that there was a significant main effect of treatment on attitude towards aseptic technique ($F_{(1,292)} = 14.708, p < .005, \eta^2 = .048$). This implies that the treatments contributed significantly to the variation in participants' scores on attitude towards aseptic technique. The eta value of .048 shows that the treatments had a contribution of about 5% to attitude toward aseptic technique.

Table 4.3b: Adjusted marginal mean showing the direction of difference in attitude toward aseptic technique among the groups

Dependent variable	Groups	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Attitude	Control	18.197	1.098	16.036	20.359
	Treatment	22.795	.481	21.849	23.741

Table 4.3b showed that participants in treatment group obtained a higher mean score (22.795) than the participants in control group who had a mean score of (18.197). This shows that participant in treatment group had better attitude than the participant in the control group. It then means that the treatment had effect on attitude towards aseptic technique among the participants.

Ho 1c: There will be no significant main effect of treatment on work risk reduction practices among health workers in Oyo State, Nigeria

The results presented in Table 4.2 showed that there was a significant main effect of treatment on risk reduction practices ($F_{(1, 292)} = 114.673, p < .005, \eta^2 = .282$). This implies that the treatments contributed significantly to the variation in participants' scores on risk reduction practices. The eta value of .282 shows that the treatment had a contribution of about 29% to risk reduction practices of the participants.

Table 4.3c: Adjusted marginal mean showing the direction of difference in risk reduction practices among the groups

Dependent variable	Groups	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
risk reduction practices	Control	17.229	1.460	14.356	20.102
	Treatment	34.293	.639	33.035	35.550

Table 4.3c showed that participants in treatment group obtained a higher mean score (34.293) than the participants in control group who had a mean score of (17.229).

This shows that participant in treatment group had better risk reduction practices than the participant in the control group. It then means that the treatment had effect on risk reduction practices among the participants.

H0 2a: There will be no significant main effect of gender on cognition of aseptic technique among health workers in Oyo State, Nigeria

The results presented in Table 4.2 showed that there was no significant main effect of gender on cognition of aseptic technique ($F_{(1,292)} = .140, p > .05, \eta^2 = .001$). This implies that gender did not contribute significantly to the variation in participants' scores on cognition of aseptic technique. The eta value of .001 shows that gender contributed about 0.1% to cognition of aseptic technique of the participants.

Table 4.4a: Adjusted marginal mean showing the direction of difference in cognition of aseptic technique by gender among the groups

Dependent variable	Gender	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Cognition of aseptic technique	Male	26.137	1.492	23.201	29.072
	Female	25.995	1.301	23.711	27.258

Table 4.4a shows that male participants obtained a higher mean score of (26.137) than the female participants with a mean score of (25.995). This shows that male participant performed better than the female participant. It then means that males are better on cognition of aseptic technique than female.

H0 2b: There will be no significant main effect of gender on attitude among health workers in Oyo State, Nigeria

The results presented in Table 4.2 showed that there was no significant main effect of gender on attitude towards aseptic technique ($F_{(1,275)} = 1.322, p > .005, \eta^2 = .005$). This implies that gender did not contribute significantly to the variation in

participants' scores on attitude towards aseptic technique. The eta value of .005 shows that gender had a contribution of about 0.5% to attitude toward aseptic technique.

Table 4.4b: Adjusted marginal mean showing the direction of difference in attitude towards aseptic technique by gender among the groups

Dependent variable	Gender	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Attitude	Male	19.198	1.026	17.178	21.218
	Female	20.794	.620	20.574	23.014

Table 4.4b shows that female participants obtained a higher mean score of (20.794) than the male participants with a mean score of (19.198). This shows that female participant had better attitude toward aseptic technique than the male participant. It then means that females are better in attitude towards aseptic technique than male.

H0 2c: There will be no significant main effect of gender on work risk reduction practices among health workers in Oyo State, Nigeria

The results presented in Table 4.2 showed that there was no significant main effect of gender on risk reduction practices ($F_{(1,292)} = .092, p > .005, \eta^2 = .001$). This implies that gender did not contribute significantly to the variation in participants' scores on risk reduction practices. The eta value of .001 shows that gender had a contribution of about 0.1% to risk reduction practices.

Table 4.4c: Adjusted marginal mean showing the direction of difference in work risk reduction practices by gender among the groups

Dependent variable	Gender	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Risk reduction practices	Male	25.519	1.364	22.835	28.204
	Female	26.002	.824	24.381	27.624

Table 4.4c shows that female participants obtained a higher mean score of (26.002) than the male participants with a mean score of (25.519). This shows that female participant performed better in risk reduction practices than the male participant. It then means that females are better in risk reduction practices than male.

Ho 3a: There will be no significant main effect of years of working experience on cognition of aseptic technique among health workers in Oyo State, Nigeria

The results presented in Table 4.2 showed that there was a significant main effect of years of working experience on cognition of aseptic technique ($F_{(1,292)} = 6.659, p < .05, \eta^2 = .019$). This implies that years of working experience contributed significantly to the variation in participants' scores on cognition of aseptic technique. The eta value of .019 shows that years of working experience contributed about 2% to cognition of aseptic technique of the participants.

Table 4.5a: Adjusted marginal mean showing the direction of difference in cognition of aseptic technique by years of working among the groups

Dependent variable	Years of working experience	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Cognition of aseptic technique	Short	24.933	1.557	23.868	29.997
	Long	26.688	.782	23.148	26.228

Table 4.5a shows that participants with long years of working experience obtained a higher mean score (26.688) than the participants with short years of working experience with a mean score of (24.933). This shows that participant with long years of experience performed better than the participant with short years of working experience. It then means that long years of working experience is better for cognition of aseptic technique.

Ho 3b: There will be no significant main effect of years of working experience on attitude among health workers in Oyo State, Nigeria

The results presented in Table 4.2 showed that there was a significant main effect of years of working experience on attitude towards aseptic technique ($F_{(1,292)} =$

5.421, $p < .05$, $\eta^2 = .017$). This implies that years of working experience contributed significantly to the variation in participants' scores on attitude towards aseptic technique. The eta value of .017 shows that years of working experience contributed about 2% to attitude towards aseptic technique of the participants.

Table 4.5b: Adjusted marginal mean showing the direction of difference in attitude towards aseptic technique by years of working experience among the groups

Dependent variable	Years of working experience	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Attitude	Short	20.107	1.071	17.999	22.216
	Long	20.885	.538	19.826	21.944

Table 4.5b shows that participants with long years of working experience obtained a higher mean score (20.885) than the participants with short years of working experience with a mean score of (20.107). This shows that participant with long years of experience performed better in attitude than participant with short years of working experience. It then means that long years of working experience is better for attitude towards aseptic technique.

Ho 3c: There will be no significant main effect of years of experience on risk reduction practices among health workers in Oyo State, Nigeria

The results presented in Table 4.2 showed that there was a significant main effect of years of working experience on risk reduction practices ($F_{(1,292)} = 4.127$, $p < .05$, $\eta^2 = .016$). This implies that years of working experience contributed significantly to the variation in participants' scores on risk reduction practices. The eta value of .016 shows that years of working experience contributed about 2% to risk reduction practices of the participants.

Table 4.5c: Adjusted marginal mean showing the direction of difference in risk reduction practices by years of working experience among the groups

Dependent variable	Years of working experience	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Risk reduction practices	Short	26.045	1.424	23.242	28.847
	Long	25.477	.715	24.069	26.885

Table 4.5c shows that participants with short years of working experience obtained a higher mean score (26.045) than the participants with long years of working experience with a mean score of (25.477). This shows that participant with short years of experience performed better than the participant with long years of working experience.

Ho 4a: There will be no significant interaction effect of treatment and gender on cognition of aseptic technique among health workers in Oyo State, Nigeria

The results presented in Table 4.2 showed that there was significant interaction effect of treatment and gender on cognition of aseptic technique ($F_{(1,292)} = 3.766, p < .005, \eta^2 = .016$). This implies that the interaction effect of treatment and gender contributed significantly to the variation in participants' scores on cognition of aseptic technique. The eta value of .016 shows that the interaction effect of treatment and gender had a contribution of about 2% to cognition of aseptic technique.

Table 4.6a: Adjusted marginal mean showing the direction of difference in cognition of aseptic technique by interaction effect of treatment and gender among the groups

Dependent variable	Groups	Gender	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Cognition of aseptic technique	Control	Male	19.536	2.675	14.271	24.801
		Female	20.409	1.742	16.980	23.838
	Treatment	Male	32.737	1.320	30.139	35.336
		Female	30.560	.459	29.657	31.463

Table 4.6a shows that male participants in treatment group obtained a higher mean score (32.737) than the male participants in control group with a mean score of (19.536). This shows that male participant in treatment group performed better than the male participant in control. It then means that male participant in treatment group is better on cognition about aseptic technique than male in control. Also from the table female participants in treatment group obtained a higher mean score (30.560) than the female participants in control with a mean score of (20.409). This shows that female participant in treatment group performed better than the female participants in control.

The overall comparison shows that male participants in treatment group had the highest mean, followed by female participants in treatment group. This means that the intervention had a better effect on cognition of aseptic techniques among males in experimental group.

Ho 4b: There will be no significant interaction effect of treatment and gender on attitude towards aseptic technique among health workers in Oyo State, Nigeria

The results presented in Table 4.2 showed that there was significant interaction effect of treatment and gender on attitude towards aseptic technique ($F_{(1,292)} = 4.780, p < .005, \eta^2 = .016$). This implies that the interaction effect of treatment and gender contributed significantly to the variation in participants' scores on attitude towards aseptic technique. The eta value of .016 shows that the interaction effect of treatment and gender had a contribution of about 2% to attitude towards aseptic technique.

Table 4.6b: Adjusted marginal mean showing the direction of difference in attitude towards aseptic technique by interaction effect of treatment and gender among the groups

Dependent variable	Groups	Gender	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Attitude towards aseptic technique	Control	Male	17.429	1.840	13.806	21.051
		Female	18.966	1.199	16.607	21.325
	Treatment	Male	20.967	.908	19.180	22.755
		Female	24.623	.316	24.001	25.244

Table 4.6b shows that male participants in treatment group obtained a higher mean score (20.967) than the male participants in control group with a mean score of (17.429). This shows that male participant in treatment group performed better in attitude than the male participant in control. It then means that male participant in treatment group is better in attitude towards aseptic technique than male in control. Also from the table female participants in treatment group obtained a higher mean score (24.623) than the female participants in control with a mean score of (18.966). This shows that female participant in treatment group performed better than the female participants in control.

The overall comparism shows that female participants in treatment group had the highest mean, followed by male participants in treatment group. This means that the intervention had a better effect on attitude towards aseptic techniques among females in experimental group.

Ho 4c: There will be no significant interaction effect of treatment and gender on risk reduction practices among health workers in Oyo State, Nigeria

The results presented in Table 4.2 showed that there was significant interaction effect of treatment and gender on rick reduction practices ($F_{(1,292)} = 4.690$, $p < .005$, $\eta^2 = .016$). This implies that the interaction effect of treatment and gender

contributed significantly to the variation in participants' scores on risk reduction practices. The eta value of .016 shows that the interaction effect of treatment and gender had a contribution of about 2% to risk reduction practices of the participants.

Table 4.6c: Adjusted marginal mean showing the direction of difference in risk reduction practices by interaction effect of treatment and gender among the groups

Dependent variable	Groups	Gender	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Risk reduction practices	Control	Male	16.071	2.446	11.257	20.886
		Female	18.386	1.593	15.250	21.522
	Treatment	Male	34.967	1.207	32.591	37.343
		Female	35.618	.420	32.792	34.444

Table 4.6c shows that male participants in treatment group obtained a higher mean score (34.967) than the male participants in control group with a mean score of (16.071). This shows that male participant in treatment group performed better in risk reduction practices than the male participant in control. It then means that male participant in treatment group is better in risk reduction practices than male in control. Also from the table female participants in treatment group obtained a higher mean score (35.618) than the female participants in control with a mean score of (18.386). This shows that female participant in treatment group performed better than the female participants in control.

The overall comparism shows that female participants in treatment group had the highest mean, followed by male participants in treatment group. This means that the intervention had a better effect on risk reduction practices of females in experimental group.

Ho 5a: There will be no significant interaction effect of treatment and years of working experience on cognition of aseptic technique among health workers in Oyo State, Nigeria

The results presented in Table 4.2 showed that there was a significant interaction effect of treatment and years of working experience on cognition of aseptic technique ($F_{(1,292)} = 21.960, p < .05, \eta^2 = .057$). This implies that the interaction effect of treatment and years of working experience contributed significantly to the variation in participants' scores on cognition of aseptic technique. The eta value of .057 shows that the interaction effect of treatment and years of working experience had a contribution of 5.7% to cognition of aseptic technique.

Table 4.7a: Adjusted marginal mean showing the direction of difference in cognition of aseptic technique by interaction effect of treatment and years of working experience among the groups

Dependent variable	Groups	Years of working experience	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Cognition of aseptic technique	Control	Short	19.875	2.889	14.188	25.562
		Long	20.070	1.358	17.398	22.742
	Treatment	Short	29.991	1.161	31.705	36.276
		Long	33.307	.778	27.775	30.838

Table 4.7a shows that participants in treatment group with long years of working experience had a higher mean score (33.307) than the participants with short years of working experience with a mean score of (29.991). This shows that participant in treatment group with long years of working experience performed better than the participant with short years of working experience. It then means that long years of working experience with the intervention is better on cognition of aseptic technique than short years of experience with the intervention. In the control group, participants with long years of experience obtained a higher mean score (20.070) than the participants with short years of working experience with a mean

score of (19.875). The overall comparison shows that participant in treatment group with long years of experience had the highest mean, followed by participants in treatment group with short years of working experience.

Ho 5b: There will be no significant interaction effect of treatment and years of working experience on attitude towards aseptic technique among health workers in Oyo State, Nigeria

The results presented in Table 4.2 showed that there was a significant interaction effect of treatment and years of working experience on attitude toward aseptic technique ($F_{(1,292)} = 16.094, p < .05, \eta^2 = .049$). This implies that the interaction effect of treatment and years of working experience contributed significantly to the variation in participants' scores on attitude towards aseptic technique. The eta value of .049 shows that the interaction effect of treatment and years of working experience had a contribution of 4.9% to attitude towards aseptic technique.

Table 4.7b: Adjusted marginal mean showing the direction of difference in attitude towards aseptic technique by interaction effect of treatment and years of working experience among the groups

Dependent variable	Groups	Years of working experience	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
					Cognition of aseptic technique	Control
Long	18.769	.934	16.931	20.608		
Treatment	Short	22.589	.799	21.017		24.162
	Long	23.000	.535	21.947		24.054

Table 4.7b shows that participants in treatment group with long years of working experience had a higher mean score (23.000) than the participants with short years of working experience with a mean score of (22.589). This shows that participant in treatment group with long years of working experience performed better than the participant with short years of working experience. It then means that long

years of working experience with the intervention is better on attitude towards aseptic technique than short years of experience with the intervention. In the control group, participants with long years of experience obtained a higher mean score (18.769) than the participants with short years of working experience with a mean score of (17.625). The overall comparison shows that participants in treatment group with long years of experience had the highest mean, followed by participants in treatment group with short years of working experience.

Ho 5c: There will be no significant interaction effect of treatment and years of working experience on risk reduction practices among health workers in Oyo State, Nigeria

The results presented in Table 4.2 showed that there was a significant interaction effect of treatment and years of working experience on risk reduction practices ($F_{(1,292)} = 18.616, p < .05, \eta^2 = .053$). This implies that the interaction effect of treatment and years of working experience contributed significantly to the variation in participants' scores on risk reduction practices. The eta value of .053 shows that the interaction effect of treatment and years of working experience had a contribution of 5.3% to risk reduction practices.

Table 4.7c: Adjusted marginal mean showing the direction of difference in risk reduction practices by interaction effect of treatment and years of working experience among the groups

Dependent variable	Groups	Years of working experience	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Risk reduction practices	Control	Short	16.500	2.642	11.300	21.700
		Long	17.958	1.242	15.514	20.401
	Treatment	Short	35.589	1.062	33.500	37.679
		Long	32.996	.712	31.596	34.396

Table 4.7c shows that participants in treatment group with short years of working experience had a higher mean score (35.589) than the participants with long years of

working experience with a mean score of (32.996). This shows that participant in treatment group with short years of working experience performed better than the participant with long years of working experience. It then means that short years of working experience with the intervention is better on risk reduction practices than long years of experience with the intervention. In the control group, participants with long years of experience obtained a higher mean score (17.958) than the participants with short years of working experience with a mean score of (16.500). The overall comparism shows that participant in treatment group with short years of experience had the highest mean, followed by participants in treatment group with long years of working experience.

Ho 6a: There will be no significant interaction effect of gender and years of working experience on cognition of aseptic technique among health workers in Oyo State, Nigeria The results presented in Table 4.2 showed that there was no significant interaction effect of gender and years of working experience on cognition of aseptic technique ($F_{(1,292)} = 2.782, p > 0.05, \eta^2 = .009$). This implies that the interaction effect of gender and years of working experience did not contribute significantly to the variation in participants' scores on cognition of aseptic technique. The eta value of .009 shows that the interaction effect of gender and years of working experience had a contribution of 0.9% to cognition of aseptic technique.

Table 4.8a: Adjusted marginal mean showing the direction of difference in cognition of aseptic technique by interaction effect of gender and years of working experience among the groups

Dependent variable	Gender	Years of working experience	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Cognition of aseptic technique	Male	Short	26.468	1.448	23.618	29.317
		Long	28.909	.594	21.741	24.077
	Female	Short	22.060	1.701	24.712	31.408
		Long	25.806	2.608	20.672	30.939

Table 4.8a shows that male participants with long years of working experience had a higher mean score (28.909) than the male participants with short years of working experience with a mean score of (26.468). This shows that male participant with long years of working experience performed better in cognition of aseptic technique than the male participant with short years of working experience. In the female group, participants with long years of experience obtained a higher mean score (25.806) than the participants with short years of working experience with a mean score of (22.060). The overall comparison shows that male participants with long years of experience had the highest mean, followed by male participants with short years of working experience.

Ho 6b: There will be no significant interaction effect of gender and years of working experience on attitude towards aseptic technique among health workers in Oyo State, Nigeria

The results presented in Table 4.2 showed that there was no significant interaction effect of gender and years of working experience on attitude of aseptic technique ($F_{(1,292)} = .370, p > .005, \eta^2 = .001$). This implies that the interaction effect of gender and years of working experience did not contribute significantly to the variation in participants' scores attitude towards aseptic technique. The eta value of .001 shows that the interaction effect of gender and years of working experience had a contribution of 0.1% to attitude towards aseptic technique.

Table 4.8b: Adjusted marginal mean showing the direction of difference in attitude towards aseptic technique by interaction effect of gender and years of working experience among the groups

Dependent variable	Gender	Years of working experience	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Attitude towards aseptic technique	Male	Short	18.444	1.794	14.913	21.976
		Long	19.951	.996	17.991	21.912
	Female	Short	21.770	1.170	19.466	24.074
		Long	21.819	.408	21.015	22.622

Table 4.8b shows that male participants with long years of working experience had a higher mean score (19.951) than the male participants with short years of working experience with a mean score of (18.444). This shows that male participant with long years of working experience performed better in attitude towards aseptic technique than the male participant with short years of working experience. In the female group, participants with long years of experience obtained a higher mean score (21.819) than the participants with short years of working experience with a mean score of (21.770). The overall comparison shows that female participants with long years of experience had the highest mean, followed by female participants with short years of working experience.

Ho 6c: There will be no significant interaction effect of gender and years of working experience on risk reduction practices among health workers in Oyo State, Nigeria

The results presented in Table 4.2 showed that there was no significant interaction effect of gender and years of working experience on risk reduction practices ($F_{(1,292)} = 1.162, p > 0.05, \eta^2 = .004$). This implies that the interaction effect of gender and years of working experience did not contribute significantly to the variation in participants' scores on risk reduction practices. The eta value of .004 shows that the interaction effect of gender and years of working experience had a contribution of 0.4% to risk reduction practices.

Table 4.8c: Adjusted marginal mean showing the direction of difference in risk reduction practices by interaction effect of gender and years of working experience among the groups

Dependent variable	Gender	Years of working experience	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Risk reduction practices	Male	Short	26.944	2.385	20.250	29.639
		Long	26.094	1.324	23.488	28.700
	Female	Short	27.145	1.556	24.083	30.207
		Long	24.860	.543	23.791	25.928

Table 4.8c shows that male participants with short years of working experience had a higher mean score (26.944) than the male participants with long years of working experience with a mean score of (26.094). This shows that male participant with short years of working experience performed better in risk reduction practices than the male participant with long years of working experience. In the female group, participants with short years of experience obtained a higher mean score (27.145) than the participants with long years of working experience with a mean score of (24.860). The overall comparison shows that female participants with short years of experience had the highest mean, followed by male participants with short years of working experience.

Ho 7a: There will be no significant 3-way interaction effect of treatment, gender and years of working experience on cognition of aseptic technique among health workers in Oyo State, Nigeria

The results presented in Table 4.2 showed that there was a significant interaction effect of treatment, gender and years of working experience on cognition of aseptic technique ($F_{(1,292)} = 23.310, p < .05, \eta^2 = .058$). This implies that the interaction effect of treatment, gender and years of working experience contributed significantly to the variation in participants' scores on cognition of aseptic technique. The eta value of .058 shows that the interaction effect of treatment, gender and years of working experience had a contribution of about 6% to cognition of aseptic technique.

Table 4.9a: Adjusted marginal mean showing the direction of difference in cognition of aseptic technique by interaction effect of treatment, gender and years of working experience among the groups

Dependent variable	Groups	Gender	Years of working experience	Mean	Std. Error	95% Confidence Interval	
						Lower Bound	Upper Bound
						Cognition of aseptic technique	Control
Long	21.571	2.522	16.608	26.535			
Female	Short	22.250	3.336	15.683	28.817		
	Long	18.568	1.006	16.588	20.548		
Treatment	Male	Short	31.111	2.224	29.733		38.489
		Long	34.364	1.423	28.564		34.164
	Female	Short	27.870	.667	32.557		35.183
		Long	33.250	.631	26.009		28.491

Table 4.9a shows that male participants in treatment group with long years of working experience obtained a higher mean score of (34.364) than the male participants in treatment group with short years of working experience with a mean score of (31.111). This shows that male participant with long years of working experience exposed to the intervention performed better than the male participant in the same group but with short years of working experience. Also from the table female participants in treatment group with long years of working experience obtained a higher mean score (33.250) than the female participants in the same group but with short years of working experience with a mean score of (27.870). This shows that female participants with long years of working experience in treatment group performed better than the female participants in the same group. The overall comparison shows that male participants with long years of working experience who were exposed to the intervention had the highest mean, followed by female participants in the same group with long years of working experience.

Ho 7b: There will be no significant 3-way interaction effect of treatment, gender and years of working experience on attitude towards aseptic technique among health workers in Oyo State, Nigeria

The results presented in Table 4.2 showed that there was a significant interaction effect of treatment, gender and years of working experience on attitude towards aseptic technique ($F_{(1,292)} = 21.673, p < .05, \eta^2 = .056$). This implies that the interaction effect of treatment, gender and years of working experience contributed significantly to the variation in participants' scores on attitude towards aseptic technique. The eta value of .056 shows that the interaction effect of treatment, gender and years of working experience had a contribution of about 6% to attitude towards aseptic technique.

Table 4.9b: Adjusted marginal mean showing the direction of difference in attitude towards aseptic technique by interaction effect of treatment, gender and years of working experience among the groups

Dependent variable	Groups	Gender	Years of working experience	Mean	Std. Error	95% Confidence Interval	
						Lower Bound	Upper Bound
						Attitude towards aseptic technique	Control
Long	18.857	1.735	15.442	22.272			
Female	Short	19.250	2.295	14.732	23.768		
	Long	18.682	.692	17.320	20.044		
Treatment	Male	Short	20.889	1.530	17.877		23.901
		Long	21.045	.979	19.119		22.972
	Female	Short	24.290	.459	23.386		25.194
		Long	24.955	.434	24.102		25.809

Table 4.9b shows that female participants in treatment group with long years of working experience obtained a higher mean score of (24.955) than the female

participants in treatment group with short years of working experience with a mean score of (24.290). This shows that female participant with long years of working experience exposed to the intervention performed better than the female participant in the same group but with short years of working experience. Also from the table male participants in treatment group with long years of working experience obtained a higher mean score of (21.045) than the male participants in the same group but with short years of working experience with a mean score of (20.045). This shows that male participants with long years of working experience in treatment group performed better than the male participants in the same group. The overall comparison shows that female participants with long years of working experience who were exposed to the intervention had the highest mean, followed by female participants in the same group with short years of working experience.

Ho 7c: There will be no significant 3-way interaction effect of treatment, gender and years of working experience on risk reduction practices among health workers in Oyo State, Nigeria

The results presented in Table 4.2 showed that there was a significant interaction effect of treatment, gender and years of working experience on risk reduction practices ($F_{(1,292)} = 29.468, p < .05, \eta^2 = .063$). This implies that the interaction effect of treatment, gender and years of working experience contributed significantly to the variation in participants' scores on risk reduction practices. The eta value of .063 shows that the interaction effect of treatment, gender and years of working experience had a contribution of about 7% to risk reduction practices.

Table 4.9c: Adjusted marginal mean showing the direction of difference in risk reduction practices by interaction effect of treatment, gender and years of working experience among the groups

Dependent variable	Groups	Gender	Years of working experience	Mean	Std. Error	95% Confidence Interval	
						Lower Bound	Upper Bound
						Risk reduction practices	Control
Long	19.143	2.306	14.604	23.682			
Female	Short	16.773	.920	14.962	18.583		
	Long	20.000	3.051	13.995	26.005		
Treatment	Male	Short	33.045	1.301	30.485		35.606
		Long	32.946	.577	31.812		34.081
	Female	Short	36.889	2.034	32.886		40.892
		Long	34.290	.610	33.089		35.491

Table 4.9c shows that female participants in treatment group with short years of working experience obtained a higher mean score of (36.889) than the female participants in treatment group with long years of working experience with a mean score of (34.290). This shows that female participant with short years of working experience exposed to the intervention performed better than the female participant in the same group but with long years of working experience on risk reduction practices. Also from the table male participants in treatment group with short years of working experience obtained a higher mean score (33.045) than the male participants in the same group but with long years of working experience with a mean score of (32.946). This shows that male participants with short years of working experience in treatment group performed better than the male participants in the same group but with long years of working experience. The overall comparison shows that female participants with short years of working experience who were exposed to the intervention had the

highest mean, followed by female participants in the same group with long years of working experience.

Summary of Findings

Hypothesis 1a: Treatment had significant effect on cognition of aseptic techniques among community health workers in Oyo state. The participants exposed to aseptic technique education (treatment group) had higher posttest mean score on cognition of aseptic technique than the participants in the control group. In addition 14% of the total variance in participants cognition of aseptic techniques was attributable to the influence of treatment.

Hypothesis 1b: Treatment had significant effect on attitude of aseptic techniques among community health workers in Oyo state. The participants exposed to aseptic technique education (treatment group) had higher posttest mean score on attitude of aseptic technique than the participants in the control group. In addition 5% of the total variance in participants cognition of aseptic techniques was attributable to the influence of treatment.

Hypothesis 1c: Treatment had significant effect on work related risk reduction practices among community health workers in Oyo state. The participants exposed to aseptic technique education (treatment group) had higher posttest mean score on attitude of aseptic technique than the participants in the control group. In addition 29% of the total variance in participants work related risk reduction practices among community health workers was attributable to the influence of treatment.

Hypothesis 2a: Gender had no significant effect on cognition of aseptic technique among community health workers in Oyo state. However, the male participants obtained the higher mean score on cognition of aseptic technique than the female participants, this shows males are better in cognition of aseptic technique than female participants. In addition 0.1 of the total variance in participants cognition of aseptic technique was attributed to the influence of treatment.

Hypothesis 2b: Gender had no significant effect on attitude towards aseptic technique among community health workers in Oyo state. However, the female participants obtained the higher mean score on attitude towards aseptic technique than the male participants, this shows females are better in attitude towards aseptic technique than

female participants. In addition 0.5% of the total variance in participant's attitude toward aseptic technique was attributed to the influence of treatment.

Hypothesis 2c: Gender had no significant effect on work related risk reduction practices among community health workers in Oyo state. However, the female participants obtained the higher mean score on work related risk reduction practices than the male participants, this shows females are better in work risk reduction practices than male participants. In addition 0.1 of the total variance in participants work risk reduction practices was attributed to the influence of treatment.

Hypothesis 3a: Years of experience had significant effect on cognition of aseptic technique among community health workers in Oyo state. However ,participants with long years of experience obtained the higher mean score on cognition of aseptic technique than the participants with short years of experience, this shows long years of experience are better in cognition of aseptic technique than participants with short years of experience. In addition 2% of the total variance in participants cognition of aseptic technique was attributed to the influence of treatment.

Hypothesis 3b: Years of experience had significant effect on attitude towards aseptic technique among community health workers in Oyo state. However, participants with long years of experience obtained the higher mean score on cognition of aseptic technique than the participants with short years of experience, this shows long years of experience are better in attitude towards aseptic technique than participants with short years of experience. In addition 2% of the total variance in participants' cognition of aseptic technique was attributed to the influence of treatment.

Hypothesis 3c: Years of experience had significant effect on work related risk reduction practices among community health workers in Oyo state. However, participants with short years of experience obtained the higher mean score on work related risk reduction practices than the participants with long years of experience , this shows short years of experience are better in work related risk reduction practices than participants with long years of experience. In addition 2% of the total variance in participants work related risk reduction practices was attributed to the influence of treatment.

Hypothesis 4a: There was significant interaction effect of treatment and gender on cognition of aseptic technique among community health workers in Oyo state.

However, male participants in treatment group obtained the highest mean score on cognition of aseptic technique followed by female participants in treatment group, this shows males in experimental group are better in cognition of aseptic technique. In addition 2% of the total variance in participants cognition of aseptic technique was attributed to the influence of treatment.

Hypothesis 4b: There was significant interaction effect of treatment and gender on attitude towards aseptic technique among community health workers in Oyo state. However, male participants in treatment group obtained the highest mean score on attitude towards aseptic technique than males in the control group, followed by female participants in treatment group, this shows males in experimental group are better in attitude towards aseptic technique. In addition 2% of the total variance in participants attitude towards aseptic technique was attributed to the influence of treatment.

Hypothesis 4c: There was significant interaction effect of treatment and gender on work related risk reduction practices among community health workers in Oyo state. However, male participants in treatment group obtained the highest mean score on work related risk reduction practices followed by female participants in treatment group, this shows males in experimental group are better in work related risk reduction practices. In addition 2% of the total variance in participants work related risk reduction practices was attributed to the influence of treatment.

Hypothesis 5a: There was significant interaction effect of treatment and years of working experience on cognition of aseptic technique among community health workers in Oyo state. However, participants in treatment group with long years of experience obtained the highest mean score on cognition of aseptic technique, this shows that participants in experimental group with long years of experience are better in cognition of aseptic technique. In addition, 5.7% of the total variance in participants cognition of aseptic technique was attributed to the influence of treatment.

Hypothesis 5b: There was significant interaction effect of treatment and years of working experience on attitude towards aseptic technique among community health workers in Oyo state. However, participants in treatment group with long years of experience obtained the highest mean score on attitude towards aseptic technique, this shows that participants in experimental group with long years of experience are better

in attitude towards aseptic technique. In addition 4.9% of the total variance in participant's attitude towards aseptic technique was attributed to the influence of treatment.

Hypothesis 5c: There was significant interaction effect of treatment and years of working experience on work related risk reduction practices among community health workers in Oyo state. However, participants in treatment group with long years of experience obtained the highest mean score on work related risk reduction practices, this shows that participants in experimental group with long years of experience are better in work related risk reduction practices. In addition, 5.3% of the total variance in participants work related risk reduction practices was attributed to the influence of treatment.

Hypothesis 6a: There was no significant interaction effect of gender and years of working experience on cognition of aseptic technique among community health workers in Oyo state. However, male participants with long years of experience obtained the highest mean score on cognition of aseptic technique this shows that male participants with long years of experience are better in cognition of aseptic technique than male with short years of experience. In addition 0.1 % of the total variance in participant's cognition of aseptic technique was attributed to the influence of treatment.

Hypothesis 6b: There was no significant interaction effect of gender and years of working experience on attitude towards aseptic technique among community health workers in Oyo state. However, female participants with long years of experience obtained the highest mean score on attitude towards aseptic technique, this shows that female participants with long years of experience are better in attitude towards aseptic technique than female with short years of experience. In addition 0.1 % of the total variance in participant's cognition of aseptic technique was attributed to the influence of treatment.

Hypothesis 6c: There was no significant interaction effect of gender and years of working experience on work related risk reduction practices among community health workers in Oyo state. However, female participants with short years of experience obtained the highest mean score on work related risk reduction practices, this shows that female participants with short years of experience are better in work related risk

reduction practices followed by male participants with short years of working experience. In addition, 0.4 % of the total variance in participants cognition of aseptic technique was attributed to the influence of treatment.

Hypothesis 7a: There was significant interaction effect of treatment, gender and years of working experience on cognition of aseptic technique among community health workers in Oyo state. However, male participants in treatment group with long years of experience obtained the highest mean score on cognition of aseptic technique, this shows that male participants in experimental group with long years of experience are better in cognition of aseptic technique followed by female participants ii treatment group with long years of experience. In addition, 0.6 % of the total variance in participant's cognition of aseptic technique was attributed to the influence of treatment.

Hypothesis 7b: There was significant interaction effect of treatment, gender and years of working experience on attitude towards aseptic technique among community health workers in Oyo state. However ,female participants in treatment group with long years of experience obtained the highest mean score on attitude towards aseptic technique, this shows that female participants in experimental group with long years of experience are better in attitude towards aseptic technique followed by female participants in treatment group with short years of working experience. In addition, 6 % of the total variance in participant's cognition of aseptic technique was attributed to the influence of treatment.

Hypothesis 7c: There was significant interaction effect of treatment, gender and years of working experience on work related risk reduction practices among community health workers in Oyo state. However, female participants in treatment group with short years of experience obtained the highest mean score on work related risk reduction practices, this shows that female participants in experimental group with short years of experience are better in work related risk reduction practices followed by female participants in treatment group with long years of working experience. In addition, 0.7 % of the total variance in participant's cognition of aseptic technique was attributed to the influence of treatment.

Discussion of findings

The finding of the study revealed that treatment had significant effect on cognition, attitude and work related reduction practices among community health workers in Oyo state. This implied that the aseptic education which was used as treatment for the experimental group was significantly effective on cognition, attitude and work related reduction practices among community health workers, the exposure of the treatment group through aseptic education brought about difference in cognition, attitude and work related risk reduction practices between the two groups, this is supported by higher post-test mean score of treatment group (31.649) that is higher than control group (19.972) for cognition, while attitude post test mean score is 22.795 for experimental and 18.197 for control group, work related risk reduction practices gives higher post test mean scores for treatment group at 34.293 and 17.229 for the control groups and this is in line with the view of Aida et al (2013) which stated that health workers that have formal training and have continuous training have more knowledge and this influences their practices of aseptic technique.

This also collaborate the findings of Oladimeji et al (2015) that training brings about good practices, this was raised during the training that was conducted during the outbreak of Ebola to assess HCWs EVD- related knowledge and practices and they found out that Lagos HCWs had a good knowledge of EVD without a corresponding level of good practices. Thereafter they were trained and the higher proportions of HCWs with good knowledge and training reported good practices. This also tallied with the findings of Offral et al (2010) who reported that there is significant positive correlations between knowledge, attitude, self reported behaviour and perceived obstacles in a study conducted among health workers in Indonesia. Salah, Fayda, meshal, Gamal and Medhat (2012) also in support reported that healthcare workers have positive attitude towards aseptic technique and use of standard precaution in the prevention of hospital acquired infections'. Health workers should have periodic training on infection control practices as training was seen to improve their knowledge and bring about a positive change in their practising aseptic techniques in their work places.

It was further established that gender had no significant effect on cognition, attitude and work related risk reduction practices among community health workers. The marginal mean showing direction of difference showed men having better

cognition of aseptic techniques, while the female participants are better in attitudes and work risk reduction practices towards aseptic technique in the use of aseptic technique at various areas of work in the health facilities gender has no effect on the use of aseptic techniques but based on the result the males had more cognition and grip of what aseptic technique is all about and this makes them to be found in areas where policies are been developed for practices and the number of males are no where compare to the number of female health workers, on the other hands the females performed better in having positive attitude to aseptic techniques and use it to reduce risk to themselves by making use of it in the health care settings as the number of females health workers working at the health facility is more than that of the males but in this study gender as a moderating variable is not significant.

This is supported by Sofola and Savage (2006) who in their study among healthcare workers in Nigeria showed insignificant gender delineation towards aseptic techniques, This result is also corroborated by Mccarthy and Macdonald(1996) who stated that men were more concerned about the financial burden of infection control cost which shows their level of being knowledgeable and have a positive attitude to infection control practices while women were more likely to attend infection control update sessions, use face masks and eye protections. This is also supported by Haitham and Huda Baker (2016) in a study that evaluated nurses practices concerning sterile techniques, critical care units in Al-Najaf Al-Ash raff city Hospitals, and found out that there is no statistical difference between the gender of nurses and their use of aseptic technique at $P>0.05$ level. Result of present findings disagree with Ghadmgahi, et.al (2011) who found out there was significant relationship between knowledge and gender when they evaluated the knowledge, attitude and self-efficacy of nursing staff in an hospital about infection control.

The study further revealed that years of experience had significant effect on cognition, attitude and work related risk reduction practices among community health workers. The effect of the treatment with the adjusted marginal mean showing the direction of difference shows the participants with long years of experience had better cognition and positive attitude towards aseptic technique, this may be due to the number of years that had been spent in service couple with periodic and continuous trainings they might have been exposed to which might have helped in gathering

experience and the knowledge acquired had positive impact and attitude towards the use of aseptic technique, the longer years spent in service might have made them believe they cannot be infected with infections again which now made them perform less in work risk reduction practices, while the participants with short years of experience perform better in work related risk reduction practices.

This may be due to the fact that they are freshly trained and the ability to work and reduce risk to themselves is still paramount in their minds, this is in agreement with the view of Devi and Tamang (2014) who found out that there was a significant association between knowledge on practice of aseptic technique during delivery with years of experience in labour room as seen by Chi Square value ($P < 0.05$). The knowledge regarding asepsis during delivery needs more emphasis, as lack of knowledge on practice of aseptic technique during delivery can increase the chances of puerperal sepsis leading to maternal death. The findings of the research suggested that retention of skills and knowledge quickly deteriorates if not used or updated regularly. Therefore, the research supports the importance of infection control strategies refresher courses on a regular basis. This is also in line with the view of Pankaj et al (2014) who found out that there was a significant association found between the knowledge and the demographic variables of aseptic technique applied in nursing practices among staff nurses, variables like years of working experience.

The finding is also in line with the finding of Ariyaratne et al (2013) who found that the practice of aseptic precaution among nursing staff with less than five years of experience was better compared to the group who had more years of experience hence the need for continuous training and practices was advocated for this is proper because the staff with long years of experience where once short years in experience and continuous training and practices will help them to keep abreast of aseptic technique practices. Result of present study disagree with Haitham and Huda Baker (2016) who found out in their study that there is no significant relationship of year of experience to use of aseptic technique by nurses in the critical care units in Al-Najaf Al- Ash raff city hospital. Frank, Robinson-Bassey and Ibudeh (2016) found out in their study among 102 nurses working in Madonna University Teaching Hospital, Elele in Rivers State that there was no significant relationship between years of

experience and compliance with standard precautionary measures which is at variance with the result of this study.

The finding further established that treatment and gender had significant interaction effect on cognition, attitude and work related risk reduction practices among community health workers. This implied that the interaction effect of aseptic techniques used as treatment and gender had significant impact on the participants' cognition of aseptic technique. The treatment given increases the cognition of the participants towards aseptic techniques. However the male participants in treatment group performed better than the male in control group in cognition of aseptic technique, while the female in experimental group performed better than the female in the control group with the men in experimental group having the highest scores. In attitude towards aseptic technique and work related risk reduction practices also the male participants in treatment group performed better than the male in control group, while the female in experimental group performed better than the female in the control group with the men in experimental group having the highest score. This shows that the treatment given was effective to bring about a desirable change so continuous training of health workers was advocated for. The outcome of this study is in line with the assertion of Yeo-Sook and Namcho (2002) who discovered that the group that receive education on aseptic technique and universal precaution has a higher level of knowledge and performed better than the group that receives no such education, this is also in consonance with the findings of Bataduwaarachi (2011) who found out that the compliance regarding aseptic precaution was significantly better among staff who had updated their knowledge during previous six month compared to those that did not in a study among the nursing staff at the national hospital of Sri Lanka. The results also in line with Duerink et.al (2013) in a study to evaluate the nurses knowledge, attitude and behaviour about infection control in the island of Java found out that 6.7% of nurses had positive attitude.

The findings also revealed that the interaction effect of treatment and years of experience is significant on cognition, attitude and work related risk reduction practices. The overall comparison shows participants in the treatment group having the highest mean scores, the implication is that the interaction effect of treatment and years of experience had significant impact on variations in cognitions, attitude and

work related risk reduction practices among the participants this shows that training in aseptic technique increases the health workers cognition, their attitude and their work related risk reduction practices than their counterpart that were not exposed to the training which is in line with the finding of Ariyaratne et al (2013) who found out that healthcare workers with short years of experience that were trained performed better with the use of aseptic precaution than their counterparts with the same years of experience that were not trained, similarly the health workers with long years of experience that were trained performed better in the area of knowledge, positive attitude and practices of aseptic technique precaution than their counterpart with the same years of experience that were not exposed to the same education.

This is also in line with the findings of Devi and Tamang (2014) who found out that the health workers with longer years of experience and who had their knowledge updated and were trained in the area of aseptic technique performed much more better in the labour room while taking delivery than their counterpart with the same years of experience that were not exposed to the training package. The result is also in line Gebresilassie, Kumei and Yemane (2014) who found out in their study among healthcare workers that health workers with less years of experience perform in hand washing and aseptic techniques which is work risk reduction practices more than the older health care workers.

The findings further established that the interaction effect of gender and years of working experience had no significant effect on cognition, attitude and work related risk reduction practices, this implication is that the interaction effect had no significant impact on variations in cognition, attitude and work related risk reduction practices among the participants. However the adjusted marginal mean showing the direction of difference shows that male participants with long years of experience had better cognition in aseptic technique than other participants, this may be due to numbers of years spent in service that had make them more knowledgeable than male health workers with short years of experience, females participants with long years of experience had better attitude towards aseptic techniques while females with short years of experience performed better with in work related risk reduction practices using aseptic techniques all are participants in experimental group, the result is in line with Osazuwa, Azodo, Ehizele and Obuekwe (2010) who reported in their study that

gender differences for three items of infection control namely hand hygiene (favoured by women) goggles (preferred by women) and protective clothing (favoured by men).

Ajayi (2008) in a study earlier in Nigeria revealed that more female, than male dental personnel were regular wearers of protective eye wears, Another Nigeria – based study among dental professionals revealed that men complied with waste disposal regulation than women in Ile- Ife and in the use of vaccination to prevent HBV more women than men had been vaccinated against hepatitis B(Pittet, 2001). The result of present study agree with Tobin, Asogun, Odia and Ehidihamhen (2013) who evaluated knowledge and practices of infection control among health workers in a tertiary hospital in Edo, Nigeria they found out that there was not statically significant relationship with gender, duration of employment or age.

The outcome of this study showed the interaction effects of treatment, gender and years of working experience on cognition, attitude and work related risk reduction practices was significant. However, male participants who were exposed to aseptic technique education with long years of experience performed better in cognition of aseptic techniques, while female participants with long years of working experience who were exposed to treatment had better attitude towards aseptic techniques education and female participants with short years of experience who were also exposed to treatment performed better in work related risk reduction practices. This result is supported with the report of Suchitra and Lakshimi (2007) that educational level has a positive impact on retention of knowledge, attitude and practices in all the categories of staff that received training when they evaluated the knowledge attitude and practices of health workers about nosocomial infections. The result is also in line with Haitham and Huda Baker (2016) who found significant relationship between level of education and use of sterile technique among nurses.

The result disagree with that of Gadzama, Bawa, Ajinoma Saida, and Usman (2014), who studied main referral hospital in northeastern Nigeria report that poor knowledge in the practices of injection safety, recapping of needles was one of the practices that contributes to needle stick injury which was commonly practiced by the respondents. The result is also corroborated by Lau (2012) who found out that female health workers washes hand more than their male counterpart and the group trained performs better than the group not trained. The result of the finding is also supported

by a significant difference that was observed between medical and nursing students who had received formal training in hand hygiene as reported by Ariyaratne et al. (2013). He further reported that among the nursing staff with less than five years of experience, the practice of aseptic precaution was significantly better compared to group who had more experience hence the need for continuous training and practices.

The overall result revealed that the control group though not exposed to the treatment also have some degree of cognition, attitude towards aseptic technique and work related risk reduction practices which may be due to previous knowledge acquired in the school or workshop they've attended before despite this the treatment groups being exposed to the treatment now have the highest mean score which shows the importance of continuous training which brings about increase in been knowledgeable about thing or issues

QUALITATIVE PRESENTATION OF THEMATIC CONTENT ANALYSIS ON
EFFECT OF ASEPTIC TECHNIQUE EDUCATION ONCOMMUNITY HEALTH

WORKERS COGNITION, ATTITUDE AND WORK RELATED RISK REDUCTION PRACTICES TOWARDS INFECTION IN OYO STATE.

The responses of health workers (interviewee) in relation to in-depth interview are explained below.

A. What do you understand by the term aseptic technique?

The result of thematic content analysis revealed that most of the respondent are aware that it is an infection prevention technique that is being made use of in health care settings to prevent transmission of infection from one patient to another and from patient to health care worker and vice versa. Here are few excerpts:

A respondent noted:

Aseptic techniques are those ways we use to reduce the occurrence of infections in our health centres. it is necessary and important as patient and health care workers can be infected

Another respondent reacted thus:

Aseptic technique must be used in the health centres if health workers will be free from infection in the settings and also not to add to patients and clients conditions negatively.

B. What are the consequences of not using aseptic technique?

The result of the analysis revealed that the respondent see the consequences of not using aseptic technique as grave as this can increase the hospital stay of patients thereby spending more money and time which also may lead to death of patients and that of health workers.

A respondent retorted:

Haa, the consequences can be fatal, look at the case of Ebola outbreak, some health workers died, due to negligence may God help us.

Another respondent reacted:

The consequences is serious as we've heard of health workers having HIV after being pricked by a needle while capping it and the needle was used for an HIV patient, what about hepatitis from contact with patients blood . many like that. What of patient that was about to be discharged and coming down with new infection on admission, the consequences is bad, seriously bad.

This assertion by the head of facilities is also in line with research question 1 that revealed that inefficient use of aseptic technique can cause hospital acquired infections that can spread into the community

C. What is the attitude in your health facility to aseptic technique?

In relation to attitude most of the respondents agreed that the attitude of health care workers in their facilities towards aseptic technique usage was poor despite their knowledge of the technique. Majority disposition towards its usage it's like it is time wasting, work overload and negligence on their part as procedures were not followed appropriately. There were different categories of health workers ranging from attendants to the most seniors, their knowledge of the techniques differed and this affected their attitude towards it.

A respondent view:

Some work here that have just secondary school certificate, their level of knowledge will be low and even those that were trained have this believe that we've been practicing for long and nothing had happened to us, so no harm will come to us.

This is in line with hypothesis 3 where the health workers with short years experience perform better in work related risk reduction practices than the health workers with long years of experience.

Another respondent reacted:

We are making use of the technique, though might not be up to expectations as those materials needed to do some procedures are not available.

D. What are the types of aseptic technique you know?

The respondents based on thematic analysis cannot really differentiate between standard precaution and aseptic technique as the two were mixed together. Hand washing, wearing of gloves, housekeeping were mentioned as types of aseptic techniques except for some that mentioned decontamination, sterilization along with hand washing and wearing of gloves as part of aseptic technique. To know which one they've engaged in before, majority mentioned hand washing with water and alcohol. They also decontaminate their instruments with 10% chlorine solution. The two types of aseptic technique were not mentioned by them.

Here are few of the excerpts:

Aseptic technique types, hand washing, following the 7 steps recommended, wearing of gloves, cleaning of the environment, cleaning of instrument after each procedures.

Another respondent reacted:

Hand washing is a type, wearing of glove as expected, use of face mask, decontamination and sterilization.

The entire respondent agreed that aseptic technique is necessary and it's a must to minimize infection to minimal level if the infection cannot be eliminated out rightly.

Aseptic technique is the main way to prevent infection and it is necessary in health care settings.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presented the summary, conclusion and recommendations which were drawn based on the result of the findings. Also the contribution of this thesis to knowledge as well as suggestions for further studies were also documented.

Summary

The study investigated the effect of aseptic technique education on cognition, attitude and work related risk reduction practices among community health workers in Oyo state. The study was carried out using non-equivalent research design of pretest-posttest control group type using 2x2x2 factorial matrix. Three hundred participants were selected for the study using multi-stage sampling procedures that involved simple random, proportionate. The participants were placed into two groups; experimental and control group. Participants were exposed to ten weeks training using the manual developed by the researcher. Data were collected before and after the intervention programme using self-developed questionnaire. Data was analysed using both descriptive and inferential statistics. The descriptive statistics used were frequency count, simple percentage, bar and pie chart while Multivariate Analysis of Covariance was the inferential statistics used to determine the main as well as the interaction effects of the independent, dependent and moderating variables.

The study provided answers to two research questions and tested seven hypotheses each with three sub variables, making it twenty one sub variables. Six of the sub variables were accepted while the remaining fifteen were rejected. The result of the study showed that aseptic technique education was effective on cognition; attitude and work related risk reduction practices while the moderating variable of gender was not significant but job tenure was significant. The result also showed that the interaction effects of treatment, gender and job tenure were significant.

Conclusion

Based on the findings of this study, it was concluded that aseptic technique education was effective on cognition, attitude and work related risk reduction practices among community health workers. Gender had no significant main effect while job tenure

had significant main effect on cognition, attitude and work related risk reduction practices. The interaction effect of the two moderating variables was not significant on cognition, attitude and work related risk reduction practices. The study also concluded that the interaction effect of treatment, gender and job tenure has significant effect on cognition, attitude and work related risk reduction practices among community health workers in Oyo state. The study among the health workers also revealed that they had cognition of aseptic techniques but work overload, non-availability of equipment sometimes hindered their capacity.

Recommendations

Based on the findings of this study and the conclusion drawn thereof, the following recommendations were made:

1. Community health workers in Oyo state, Nigeria need to be educated on the benefits of using aseptic techniques which may lead to reduction of hospital acquired infections thereby leading to reduction in morbidity and mortality among health care workers and patients
2. Health professional associations at community level should support Oyo State government through policy on use of aseptic technique as a way to reduce hospital acquired infections and promote good health condition for both patients and health workers in the state.
3. Aseptic technique education should be used by health teachers, health agency, researchers as well as those involve in infection control practices to improve adequate use of aseptic technique by health care workers in health care settings.
4. Multidisciplinary and interdisciplinary research which would inform the development of intervention strategies is also needed. Both basic and applied research is necessary, as well as interdisciplinary collaboration to develop interactive models on human behaviour, health and illness.
5. Both governmental and nongovernmental organisations in charge of health programme and activities should encourage health workers to make use of aseptic technique practices while attending to clients in an health care settings

6. Provision of materials and equipment needed in aseptic procedures in health facilities should be made available by government so that efficient use of aseptic technique procedures can be undertaken by healthcare workers
7. Donor agencies should promote the use of aseptic techniques in all health programmes they are supporting at community level in Oyo state

Contribution to knowledge

This study has contributed to knowledge in the following ways;

1. Aseptic technique education was effective, improves cognition, attitude and work related risks reduction practices among community health workers
2. Male health workers are better in cognition of aseptic techniques while the female health workers perform better in attitude towards aseptic techniques and work related risk reduction practices
3. Health workers with long years of experience are better in cognition and attitude towards aseptic techniques while the health workers with short years of experience performed better in work related risk reduction practices reasons for this may be due to the fact of familiarity of workers with long years of experience with job schedules.
4. Males with longer years of experience have better cognition of aseptic technique while females with shorter years of experience are better in work related risk practices and females with long years of experience are better in attitude towards work related risk practices.

Suggestions for further studies

Based on the findings and limitations of the study, the following studies are suggested to be considered worth investigating by researchers.

1. Aseptic technique education on healthcare workers working at specialist and teaching hospitals as well as federal medical centres.
2. Comparative study of Aseptic technique education on cognition, attitude and work related reduction practices among health workers in state and federal hospitals.
3. The study can be replicated on health workers in private hospitals.

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APPENDIX I
QUESTIONNAIRE

DEPARTMENT OF HUMAN KINETICS AND HEALTH EDUCATION
FACULTY OF EDUCATION, UNIVERSITY OF IBADAN, IBADAN.

EFFECT OF ASEPTIC TECHNIQUE EDUCATION ON COMMUNITY HEALTH
WORKERS COGNITION, ATTITUDE AND WORK RELATED RISK
REDUCTION PRACTICES TOWARDS INFECTION IN OYO STATE

Dear Respondent,

This questionnaire is designed for a PhD research study on Effect of Aseptic Technique Education on Community Health Worker's Cognition, Attitude and Work Related Risk Reduction Practices towards Infection in Oyo State. I solicit for your co-operation by responding sincerely to the items in each of the sections. The information supplied will be for the purpose of this research work only and will be treated with utmost confidentiality. Your participation is voluntary and it is expected that the outcome of this study will be used to design appropriate training programme for health workers in your health zone.

Thanks for your anticipated co-operation.

Yours sincerely,

Ogunmola Patricia.O.

Researcher.

SECTION A

DEMOGRAPHIC DATA

Please tick the column that best represent your responses.

1. Gender: 1. Male [] 2. Female []
2. Age in years. 1. Less than 25 [] 2. 25 -29 [] 3. 30 - 34 []
4. 35 -39 [] 5. 40- 44 [] 6. 45 and above []
3. Marital Status. 1. Married [] 2. Single [] 3. Seperated []
4. Divorced [] 5. Single Parent [] 6. Widow []
7. Widower []
4. Religion. 1) Christianity [] 2) Islam []
3) Traditional [] 4) Others []
5. Years of Working Experience
1. Less than 5 years [] 2. 5 – 9 years [] 3. 10 – 14 years []
4. 15 – 19 years [] 5. 20 years and above []
6. Cadre.
1) Doctor [] 2) Nurse/midwife [] 3) CHO [] 4) CHEW []
5) Health assistants [] 6) Health attendants [] 7) Lab.scientist []
7. What are causes of hospital acquired infections?
1) Infections [] 2) inefficient use of aseptic technique [] 3) Lack of training on aseptic technique [] 4) Reduced skilled hands in work places []
8. Why will a health worker not make use of aseptic techniques?
1) Work overload [] 2) Inadequate man power [] 3) Non-availability of relevant materials and equipment [] 4) Non- challant attitude of health workers []

SECTION B

COGNITION OF HAIs REDUCTION PRACTICES QUESTIONNAIRE
[CHRPQ]

Please tick the appropriate column that most suit your opinion.

S/N	Pick true or false against the following items on aseptic technique.	True	False
1	The goal of aseptic technique is to minimize contamination of health provider and patient by pathogens.		
2	Medical and surgical asepsis are types of aseptic techniques		
3	Maintaining seals on all fluids and injections when not in use.		
4	When in doubt it is better to discard a potentially contaminated item and begin again.		
5	Tables are considered sterile only at or above the level of the table.		
6	Sterile packages should be opened close to time of actual use.		
7	Health workers with cold should avoid working while ill or apply a double mask.		
8	There should be no talking, laughing coughing or sneezing across a sterile object.		
9	Hand gloves must be consistently and appropriately used.		
10	Health care workers need to put on personal protective equipment which prevents exposure to infections during health care activities.		
11	Decontamination kills many diseases causing organisms		

S/N	Pick true or false against the following items on aseptic technique.	TRUE	FALSE
12	Sterilization is the method recommended for sterilizing items that comes into contact with the blood stream or tissues beneath the skin.		
13	Infections are spread by health workers as well as patient in the hospital and this infections are known as hospital acquired infections		
14	Risk management is a function of a health worker to prevent infections.		
15	Hand washing is in 7stages.		
16	Proper steps must be follow in wearing of gloves to prevent infections in healthcare settings		
17	High level disinfection is another alternative if sterilization is not available		

**ATTITUDE TOWARDS HAIs REDUCTION PRACTICES QUESTIONNAIRE
(ATHRPQ)**

Tick the appropriate column that depicts your level of agreement.

S/N	ITEMS	Strongly Agree	Agree	Strongly Disagree	Disagree
1	I am always overworked, so there is little or no time to wash hands before attending to each patient.				
2	If a patient looks okay there is no need to put on glove before attending to the person.				
3	Changing gloves for each patient is a waste of time.				
4	Changing gloves for each patient is a waste of resources				
5	It is not very necessary to use face mask as it does not totally prevent infection.				
6	It is not necessary to wear apron before coming in contact with body fluids.				
7	I am always busy giving injections so there is no need for safety box I can drop used needle inside dustbin to safe time.				
8	Following aseptic technique procedures is time wasting.				
9	I don't need to decontaminate couch and trolley before delivery services				

S/N	ITEMS	Strongly Agree	Agree	Strongly Disagree	Disagree
10	Decontamination of instrument after each procedure is a waste of time				
11	Sterilization does more harm than good as it makes instrument to be blunt for use				
12	I am smart I cannot contract HIV, Hepatitis B or other hospital acquired infection.				
13	Following of steps in aseptic technique procedure does not worth the effort.				
14	Disinfection procedure is a waste of time.				

WORK RELATED RISK REDUCTION PRACTICES OF ASEPTIC TECHNIQUES QUESTIONNAIRE [WRRRPQ]

In line with your work, respond to the items below by marking X in the column of your choice.

S/N		ALWAYS	SOMETIMES	NOT AT ALL
1	I wash hands, air dry and dry with clean towel before and after a procedure			
2	I wash my hand between patients/or procedures on the same patients.			
3	I put on glove when in direct contact with open wound or soiled area			
4	I promptly dispose body fluid soaked bandages and used materials in appropriate waste bins.			

S/N		ALWAYS	SOMETIMES	NOT AT ALL
5	I clean site with spirit when giving intramuscular injections and apply clean cotton wool to the injection site.			
6	I put on gloves during intravenous line insertion.			
7	I put on personal protective clothing's when in the labour room and theatre. (e.g. apron, surgical gloves, nose masks, theatre and labour room boot).			
8	I put on nose mask when at direct contact with infective patient.			
9	I reuse needle for more than one patient.			
10	I handle sterile instruments putting surgical gloves on.			
11	I soaked used instruments and other items in 0.5% chlorine solutions for 10 minutes before re-use or storage.			
12	I wear thick utility gloves while cleaning instruments			
13	I decontaminate large surfaces (eg operating tables, laboratory bench top) and other equipments that might have come in contact with blood			
14	I use a new hypodermic needle and syringe in giving injection.			

Any other comment/information-----

Thank you very much.

APPENDIX II
INTERVIEW GUIDE FOR COMMUNITY HEALTH WORKERS IN OYO
STATE.

Introduction

Good day. I am Mrs and my colleagues names are.....
 We are from University Ibadan, Department of Human Kinetics and Health Education. We invite you to share your views with us on issues relating to effect of aseptic technique training on community health worker's cognition, attitude and work related risk reduction practices towards infection in Oyo state. In this interview there is no right or wrong answers, all we need are your honest views or perceptions about issues that will be raise for your candid opinion. We request your permission to write and tape record your responses so that we can remember the views you share with us today. Do you agree please? We assure you that whatever you tell us will be made confidential and will be use to design training programme for health workers, so feel free to talk and freely express your views. For the avoidance of doubt your names will not be written down or tape recorded. Thank you.

Interview Discussion Guide

S/N	Questions	Probes
1	What do you understand by the term aseptic technique?	Are this necessary in health facilities procedures?
2	What are the consequences of not using aseptic technique?	
3	What is the attitude of health workers in your health facility to aseptic techniques?	
4	What are the types of aseptic techniques you know?	Which one have you engage in before?

Thank you.

APPENDIX III

ASEPTIC TECHNIQUE TRAINING PACKAGE

SESSION 1 : ADMINISTRATION OF PRE-TEST INSTRUMENT

The purpose of this session is to administer the questionnaire on the participants so as to determine the ability of the health workers who will benefit from the training. The researcher will familiarize with the member of the group and welcome them warmly into the programme. The participant will be informed that they will be having 10 sessions of 2 hours each for a period of 10weeks. The researcher will explain the reason for the programme and what the participants stand to benefits at the end of the programme.

The researcher will explain the rule guiding the conduct of the conduct of the programme and what is expected of the participants. The researcher will administer the pre-test instruments to the participants.

SESSION TWO: HOSPITAL ACQUIRED INFECTIONS/ HEALTH CARE ASSOCIATED INFECTIONS

Infection is an uncontrolled growth of harmful microorganism in a host. It is a process of infecting of a host by an organism. Infection in health care setting is as hospital acquired infections (HAIs), this are infections that are not present in the patient at the time of admission to hospital but develop during the course of stay in the hospital. Infections are caused by infectious agents. These are biological agents that cause diseases or illness to their host, there are many infectious agents present in health care settings like bacteria, virus, protozoa and fungi. Patients and health care workers are the most likely sources of infectious agents and also the most common susceptible hosts as well as other people visiting and working in health care.

There are two forms of hospital acquired infections;

- 1) Endogenous infection, self infection or auto infection.

In this type of infection the causative agent of the infection is present in the patient at the time of admission to hospital but there are no signs of infection. The

infection develops during the stay in hospital as a result of the patients altered resistance.

2) Cross-contamination followed by cross infection.

During the stay in the hospital the patients comes into contact with new infective agents, becomes contaminated and later develops infection.

The source of infection in health care facility and of the preceding contamination may be the personnel, the patients or the in animate environment.

The hospital environment can be contaminated with pathogens like salmonella or shigella Spp, from improper waste disposal, improper cleaning of blood stained rooms. Escherichia Coli 0157 or other pathogens may be present in food and cause outbreak of diseases just as they can in a community outside the hospital.

The health worker can also be the source of outbreak of hospital acquired infection, any health worker who is infected or colonized (a carrier). Pathogens that can be found in symptomless carriers include streptococcus pyogenes, corynebacterium diphtheriae, Neisseria meningitis, hepatitis B virus and cytomegalovirus. Contamination of patients by carriers can give rise to an outbreak of disease. Infected health workers should be excuse from work and if not possible they are asked to use personal protective equipment.

Infected patients are the source of most hospital acquired infections as these microorganisms are often released into the environment in very high numbers, exceeding the minimal infective dose thereby contaminating other patient, who subsequently now develop hospital acquired infection.

Routes of transmission.

Three main routes of transmission were identified

- 1) Contact which could be direct or indirect
- 2) Airborne transmission.
- 3) Vector borne transmission

Direct contact occurs when there is transfer of microorganisms from direct physical contact between an infected or colonized individual and a susceptible host for example when health worker touch a vulnerable site like a patient wound and become contaminated. Indirect transmission is passive transfer of an infectious agent to a susceptible host through an intermediate object or furniture surfaces.

- 2 Air borne transmission is when microorganism is dispersed into the air.
- 3 Vector borne transmission – in countries where insects,arthropods and other parasites are wide spread, they can become contaminated by contact with excreta or secretions from an infected patient and environment which is filthy and then transmit the infective organism mechanically to other patients

Methods of infection prevention

The following are methods of infection prevention:

1. Hand washing
2. Disinfection and decontamination
3. Sterilization
4. Precaution and isolation of infected patients
5. Use of personal protective equipment

SESSION THREE –Importance of infection prevention and control

Infection, prevention and control are paramount to prevent spread of infections in the community down to the society and through the nation as a whole and this leads to wellness of the nation.Many health workers had been exposed to different kind of infection when performing their duties as health workers which had lead to their death and some had learn to live with their condition to prolong their life time. Epidemics of some disease had evolved over time killing a lot of people due to negligence of health workers not adhering to aseptic technique whereby this infections and disease were transferred through direct and indirect contact to their family members.

Patient who visited the hospital most times went home with other type of infection or come down with other type of infection they do not come with to the hospital when proper aseptic technique were not followed by the health personnel and this incur more expenses on the part of the patient in the hospital.

Prevention of infection is also important to the nation as a whole as spread of infection can lead to reduction in the population of a country and this can have aderse effect on the nation as a whole. Looking at the case of Ebola and HIV the spread of such infections can wreck havoc on an economy.

Risk Management in preventing hospital acquired infection

This involve five (5) stages which are explain below

1. Avoid the Risk. The best way to manage a risk is to avoid it. It is valuable to consider the following before performing a procedure. As health workers you want to know whether the planned intervention is necessary. Is there alternative procedure that would eliminate or minimize potential exposure of the patient or health worker to infectious agent?

2- Identify the Risk. In this case the health workers is to considered the risk of hospital acquired infection when approaching a clinical task in terms of where/ why/ how can they occur.

3- Analyze the Risk. The identified risk associated with the task need to be analyzed, after which it is evaluated.

4- Evaluate the Risk. This stage assess whether the level of risk is acceptable or not acceptable.

5- Treat the Risk. All information gather from previous steps is brought together to consider what action to be taken. The risk reduction practices after being identified, the steps to follow involve

- Proper hand washing
- Decontamination
- Sterilization

Appropriate use of personal protective equipment – gloves, nose mask, wearing of gloves and proper disposal of sharps into sharp containers

SESSION FOUR – Injuries and Work Related Risk Reduction Practices

Staff that come in contact with sharps – from doctors and nurses to those who dispose of the trash-are at risk of infections.

How injuries commonly occur

- i. Recapping hypodermic needles after use (this is one of the major causes of sharp-object injuries.

- ii. Any manipulation of used sharps before disposal (such as bending, breaking or cutting hypodermic needles, which can cause the blood inside to splatter or cause staff to accidentally injure themselves).
- iii. Accidentally sticking another staff member when there is sudden motion involving persons carrying unprotected sharps.
- iv. Leaving sharp items in areas where they are unexpected, such as on surgical drapes or bed line.
- v. Accidentally sticking or cutting themselves during surgical procedures in which there is limited visibility of the hands, many sharp instruments are used, or sharp instrument suture needles are used in confined spaces (such as many obstetric/gynecological and orthopedic procedures)
- vi. Handling or disposing of waste that contains used hypodermic needles or other sharps.
- vii. Unexpected client motion at the time of injections. Always warn clients when you are about to give them an injection.
- viii. During placement of needles or sharps into disposal container that are full or do not allow for easy insertion of the items.
- ix. When the surgeon or assistant uses their fingers as a guide or when tissue is hand-held during suturing, during manual retraction of tissue / organs, or when tying suture material with the needle still attached.
- x. When needle holders with the needle are left exposed.
- xi. Other devices that cause stick-injuries and perforation of gloves include the use of suture needle without a needle holder, wire sutures, trocars, stylets, sharp pointed scissors, sharp pointed retractors, skin hooks, penetrating towel clips, tenaculi.
- xii. Scalpel injuries occur most frequently when instruments are handed from user to an assistant (transferring between personnel).

To prevent injuries due to sharps

- i. Handle hypodermic needles, syringes, and other sharps minimally after use, and use extreme care whenever sharps are handled.
- ii. Avoid recapping needles and do not bend, break or cut them before disposal.

- iii. Dispose of hypodermic needles, scalpel blades, and other sharps in puncture resistant containers immediately (or as soon as practical) after use.
- iv. Incinerate/burn or bury the container when three quarters full.
- v. Always wear utility gloves when disposing of sharps containers
- vi. Always wear utility gloves when washing sharps.
- vii. Use the “hands-free technique” to pass sharps during clinical procedures.
- viii. Let clients know when you are going to give an injection to avoid startling client and causing an injury.
- ix. Promote safety awareness during in service session focused on supporting behavior change to prevent or minimize needle stick and sharp instrument injuries.
- x. Manipulate or reposition scalpel blades using forceps to grasp the blade
- xi. Consider using staples in place of suture and suture needles, if it would be an appropriate option.
- xii. Use curved needles with a needle holder as a safer option to straight, hand held needles.
- xiii. Blunt instruments can be an alternative for preventing injuries, such as rounded point scissors, non-penetrating towel clips, blunt retractors, and synthetic sutures instead of wire sutures.
- xiv. When transferring sharps between personnel avoid hand-to-hand transfer, create a safety zone using a flat tray, mat, part of the instrument stand, or designated area on the field where instruments can be placed by the user and safely picked up by the assistant. Do not use a kidney basin from which items are hard to pick-up

The hands free technique for passing sharps during clinical procedures.

Health care workers can accidentally stick each other if or when passing sharps during a procedure, there is sudden motion involving persons carrying unprotected sharps (such as on surgical drapes). Unprotected sharps should not be passed directly from one person to another.

In the operating theatre or procedure room, pass sharp instruments and other items in such a way that the surgeon and assistant are never touching the instrument or other item at the same time (known as the hands-free technique).

Disposal of needles and other sharps

Improper disposal of contaminated sharp objects can cause infections in the health care facility and the community. Make hypodermic needles and other sharps unusable by incinerating them. If an industrial incinerator that will destroy hypodermic needles and other sharps is not available, reduce the risk of infection by decontaminating sharps before disposal, and bury them in a pit to make it difficult for others to scavenge them.

Sharp-disposal container

A puncture-resistant container should be used for disposal of used needles and other sharp objects. A sharp-disposal container may be made out of a heavy cardboard box, an empty plastic jug, or a metal container.

Giving injections

To reduce the risk of transmitting infections between clients:

- i. Always use a new hypodermic needle and syringe time an injection is given.
- ii. Never change the needle without also changing the syringe between clients. Reusing the same syringe to give injections to multiple clients – even if the needle is changed – is not a safe practice.
- iii. Before giving an injection, if there is visible dirt, wash the injection site with soap and water.
- iv. Wipe the client's skin at the injection site with an antiseptic solution to minimize the number of microorganisms and reduce the risk of infections. Using a fresh swab, wipe in a circular motion from the center outward.
- v. If alcohol is used, allow the alcohol to dry in order to provide maximum effectiveness in reducing microorganisms.

Note: Unexpected client motion at the time of injection can lead to accidents. Therefore, always warn clients when you are about to give an injection. To avoid needlestick accidents, follow the instructions for proper disposal and decontamination of used needles and syringes.

To avoid transmitting infections when giving IV fluids

- i. Unhook the needle or catheter from the IV line, and dispose it in a sharps disposal container.
- ii. Throw away the IV line and any remaining fluid. Microorganisms can survive and grow in IV fluids; if the IV line and bag/bottle of fluid are used again, infection can be transmitted to other clients.
- iii. Never use the same IV line and fluid bag/bottle with multiple clients.

Use of multidose Vials

Before filling a syringe from a multidose vial:

- i. Check the vial to be sure there are no leaks or cracks
- ii. Check the solution to be sure it is not cloudy and that there is no particulate matter in the vial.

Most solutions that come in vials are clear. One exception is the injectable contraceptive Depo-Provera, which is milky). Wipe the top of the vial with a fresh cotton swab soaked with 60-70% alcohol; allow to dry.

To reduce the risk of transmitting infections between clients:

- i. Always use a new hypodermic needle and syringe every time medication is withdrawn from a multidose vial. ***Reusing the same syringe to give injections to multiple clients – even if the needle is changed is not a safe practice.***
- ii. Never leave one needle inserted in the vial cap for multiple uses. This provides a direct route for microorganisms to enter the vial and contaminate the fluid between each use.
- iii. Wash hands with soap and water.

- iv. Where there is bleeding, allow the site to bleed briefly. (*There is no scientific evidence that cleaning the wound with an antiseptic or squeezing the wound decrease the risk transmitting blood organisms*).
- v. If a mucous membrane has been injured or splashed, flush with a large amount of water.
- vi. If the eyes have been splashed, irrigate with clean water, saline, or sterile irrigating solution.
- vii. In the absence of water, an antiseptic solution can be used to flush the area but remember that antiseptic solutions have not been proven to be any more effective than soap and water.
- viii. Assess the injured health worker's risk for infection following exposure – depth of wound, type of instrument involved, amount and type of bodily fluid.
- ix. If feasible, determine the HIV status of the source patient, with appropriate counseling and disclosure of serological status. This is a particularly important step in settings where resources are limited and recommended prophylactic drugs may not be readily available. Determining that the source patient is HIV negative will eliminate the need for drug therapy, its attendant side effects, costs and emotional stress of not knowing the risk following exposure or whether the drug therapy will work. Based on the assessment findings, determine the need for prophylaxis.
- x. Post exposure care includes voluntary counseling, HIV testing, treatment, and follow-up care.
- xi. If the health care worker will receive antiretroviral drugs, counsel the worker about the possible side effects associated with the prophylactic drugs (ZDV) and (3TC). Although these drugs are usually well tolerated, some of the more common side effects include:
 - a. Stomach upset (nausea, vomiting and diarrhea), tiredness, or
 - b. Headache (ZDV)
 - c. Stomach upset (rarely, pancreatitis with 3 TC)
- xii. Jaundice and kidney stones in people taking ZDV; this can be reduced by drinking 48 ounces of fluids during every 24-hour period.

- xiii. Counsel the injured health worker about behaviors to prevent transmission of HIV, such as not providing blood, organ, or semen donations; abstaining from sexual intercourse. If abstinence will be difficult or not possible for the health worker, counsel her/him to use latex condoms consistently and correctly to reduce the sexual transmission of HIV.
- xiv. Encourage the injured health care worker to include their partner in counseling. In settings where breast milk substitutes are affordable, accessible, and can be safely used, women may be advised to avoid breast feeding during the PEP period to prevent exposing their infants to HIV in the breast milk. Post-exposure care should include the following, where feasible:
 - a. Screening / testing for baseline and periodically up to 6 months after exposure (e.g. at 6 weeks HIV antibody testing of the health care worker, as soon as possible after, 12 weeks, and 6 months).
 - b. When antiretroviral drugs are being taken for PEP, assessment of toxicity with complete blood count, kidney and liver function tests before starting treatment and at 2 weeks after starting treatment.
 - c. Instruct the health care staff under treatment to report any sudden or severe flu-like illness that occurs during the follow-up period.
 - d. Counsel the injured worker regarding her/his emotional response, fears, and/or concerns regarding the reaction of their partner or spouse.

The essential elements of post exposure care are:

- i. Immediate wound care
- ii. Counseling injure health care worker
- iii. Risk assessment with health care worker
- iv. Counseling, testing of source patient, if possible
- v. Counseling, testing of injured health care worker, if possible
- vi. Antiretroviral drug therapy, if indicated and available
- vii. Follow-up monitoring and counseling

SESSION FIVE: Housekeeping

Definition of housekeeping

Housekeeping is the general cleaning and maintenance of cleanliness in a health care facility. In addition to cleanliness, the purpose of housekeeping is to reduce the number of micro organisms in the facility (thus reducing clients 'and staff members' risks of infections) and provide an appealing work and service-delivery space

Importance of Housekeeping and Waste Disposal

The purpose of proper waste disposal of clinic wastes is to:

- i. Prevent spread of infection to clinic personnel who handle the waste and to the local community.
- ii. Protect those who handle wastes from accidental injuries
- iii. Provide an aesthetically pleasing atmosphere.

If not disposed of properly, contaminated waste is a potential source of infection for both staff and the local community. Therefore,

- i. Always keep waste containers in convenient places for users outside or leave it in an open pit.
- ii. Always dispose of contaminated waste properly – never simply throw it outside or leave it in an open pit.
- iii. Always wear utility gloves when handling and transporting waste and wash both the gloves and your hand afterwards.

Waste Containers

- i. Use washable, leak-proof containers
- ii. If a container is reusable, disinfect it with a 0.5% chlorine solution after each use
- iii. Use waste bags

Liquid waste

- i. If possible, pour waste down a utility drain or into a flushable toilet or latrine. Know where the drain empties.
- ii. If you cannot pour waste down a drain, or toilet, bury it in a pit.
- iii. Always be careful when disposing of liquid waste. Do not allow the liquid to splash while you are pouring it.

Role of Housekeeping in Infection Prevention

The cleanliness of a health care facility is vital to the health and safety of its clients, staff and visitors, as well as to the community at large; it is the foundation for preventing the transmission of infections in the facility. The facility's cleanliness is often the first thing that a client or visitors. In addition, an appealing environment contributes to staff members' satisfaction in working at the facility (which promotes use of the services). In places where clients and visitors may be unaccustomed to the standards of hygiene required in a health care facility, health care workers need to pay special attention to housekeeping.

General Housekeeping Guidelines

The general guidelines for housekeeping include the following:

- i. Cleaning schedules should be created and posted where all staff responsible for housekeeping can see them, and closely followed.
- ii. Always wear gloves (preferably heavy utility gloves) and shoes when cleaning client-care areas.
- iii. Cleaning should be done in a way that minimizes the scattering of dust and dirt that may contain microorganisms. Use a damp or wet mop or cloth to clean walls, floors, and surfaces; avoid dry-dusting or sweeping, which increases the spread of dust and microorganisms
- iv. Scrubbing is the most effective way to remove dirt and microorganisms. Scrubbing should be a part of every cleaning procedure.

- v. Wash surfaces, such as walls, from top to bottom so that debris falls to the floor, where it can be cleaned up last. Similarly, clean highest fixtures first and work down—for example, clean ceiling lamps first, then shelves, then tables and then the floor.
- vi. Change cleaning solutions when they appear dirty. The disinfectant's ability to kill potentially infectious microorganisms is reduced when the solution contains a lot of soil.

Remember: Supplies and equipment used for cleaning need to be cleaned to prevent the spread of infections. Housekeeping equipment, such as mops, buckets, and cloths, should be decontaminated, cleaned in detergent and water, rinsed in clean water, and allowed to dry before being reused. Contaminated cleaning equipment spreads microorganisms, rather than reduces it in the environment.

Waste Disposal

Contaminated wastes may carry high loads of microorganisms, which are potentially infectious to any persons who contact or handle them, and to the community at large, if not disposed of properly. Contaminated wastes include blood, pus, urine, stool, and other body fluids as well as items that come in contact with them such as gauze or used dressings. Wastes from procedure rooms, delivery rooms, operating rooms and laboratories should be considered contaminated. In addition, contaminated waste may include items that can inflict injury (e.g. used needles and blades) and spread blood-borne diseases such as hepatitis B and HIV infection.

Proper handling of waste items minimizes the spread of infection to clinic personnel and to the local community. Contaminated wastes should be transported to disposal sites in covered containers where available. Persons handling wastes should wear heavy gloves. All sharp items should be disposed in puncture-resistant containers. Liquid waste should be carefully poured down a utility drain or flushable toilet or latrine. Hands, gloves and containers should be washed after disposal of infectious waste. It is best to burn or bury contaminated waste than use community waste collection because of the likelihood of the waste being deposited into a

community dump site. This would increase the risk of exposure to other people. Burning or burying on site may be more difficult, but it is best for the community.

Summary

Proper disposal of sharps, effective housekeeping within the health facility, and appropriate disposal of dry and wet wastes are essential for infection prevention. Observing the general guidelines for housekeeping is the easiest way to keep the facility infection free.

SESSION SIX – Standard Precaution and Aseptic Technique.

Standard precaution is an adjunct to aseptic technique procedure. These provide guidance on infection control precautions that should be applied by all healthcare workers to the care of all hospital in-patients all the times.

There are four distinct interventions

- 1) Hospital environmental hygiene
- 2) Hand hygiene
- 3) The use of personal protective equipment
- 4) Use and disposal of sharps.

Aseptic techniques involves

- 1) Decontamination
- 2) Sterilization
- 3) Maintaining a sterile field in surgery

It is a safety procedure and practices designed to reduce the risk of transmission of blood borne infection. The two are interwoven and cannot be performed without each other but standard precaution is an adjunct to Aseptic technique, the procedure that needed to be done, or put in place to make aseptic technique effective.

Hospital environmental Hygiene – The hospital must be visibly clean, tidy free from dust and soilage, sharps should not litter the ground. This include

- i. Cleaning, laundry and house keeping
- ii. Safe collection and disposal of general and clinical waste
- iii. Kitchen and food hygiene.

Hand hygiene – Hand washing is one of the most important precaution measure against transmission or contamination of infection by health works.

- i. Hand must be washed before any procedure.
- ii. It must be washed in between patient
- iii. When visibly soiled or not
- iv. It can be wash with soap and water also by using alcohol based hand wash and wiping with a clean towel.
- v. All rings must be removed during the procedure

Hand washing Procedure

- 1) The hand must be washed under running water. Liquid soap is preferable than solid soap to prevent cross infection. The liquid soap is put on the palm of the left hand and under running water the palm is rubbed together, the finger tips is washed against each palm. In between the fingers are washed then each thumb is washed. The back of the hands are washed then the wrist. The hand is used to collect water from the tap to rinse off. Then a clean towel is used to clean off. In the theatre sterile cloth can be used to clean off before putting on the glove.

The use of personal protective equipment

Personal protective equipment is a specialized clothing or equipment worn by an employee for protection against infectious materials. Protective equipment should be selected based on the basis of an assessment of the risk of transmission of micro organisms to the patient and the risk of contamination of health care practitioners,

clothing and skin by patient blood, body fluids. Durability and appropriates should be taken into consideration and the PPE must fit the individual users. How to wear the following to prevent infection will be discussed and put into practice, gloves, gown, apron and booth, clothing mask and respiration, goggles protects eyes and face shield protect the entire face

SESSION SEVEN–Aseptic Technique

Aseptic Technique, {Types and Principles of Aseptic Techniques}.

Aseptic technique is employed to maximize and maintain asepsis, this is the absence of pathogenic organism in the clinical settings, it also refers to specific practices which reduces the risk of post- surgical infection in patients and also to help health workers avoid been exposed to blood, body fluids, tissues and other infectious materials. Proper aseptic technique is one of the most fundamental and essential principles of infection control in the clinical and surgical settings. Aseptic technique are those technique which; remove or kill micro organism from hand and objects, employ sterile instruments and other items; reduces patients risk of exposure to micro organisms that cannot be removed.

There are two types of Aseptic Techniques

1. Medical Asepsis
2. Surgical Asepsis

Medical Asepsis are technique employ or make use of to prevent the spread of infection in clinical settings which is employed during procedures like, giving of injection, vaginal delivery, circumcision, insertion of IUD and implants, setting of IV fluid amongst other.

Surgical Asepsis, this are technique employ in the surgical unit of a health care settings (theatre room) to prevent the spread of infection to patient and health workers. This means that it is not only people working in the theatre that needs to make use of aseptic technique, people working in the clinical areas needs to employ asepsis in procedure perform in their settings also

Principles of Aseptic technique

These are principles of aseptic technique that needs to be followed to prevent infection.

- i. All item in a sterile field must be sterile
- ii. Sterile packages or fields are opened or created as close as possible to time of actual use.
- iii. Moist areas are not considered sterile
- iv. Contaminated items must be removed immediately from the sterile field.
- v. Only areas that can be seen by the clinicians are considered sterile (the back of the physician are not sterile)
- vi. Gowns are considered sterile only in the front from chest to waist and from the hands to slightly above the elbow.
- vii. Tables are considered sterile only at or above the level of the table.
- viii. Non sterile items should not cross above the level of the table.
- ix. There should be no talking, laughing, coughing or sneezing across a sterile field.
- x. Personnel's with colds should avoid working while ill or apply a double mask.
- xi. Edge of sterile areas or field (generally the outer inch) are not considered sterile.
- xii. When in doubt about sterility, discard the potentially contaminated item and begin again.
- xiii. A safe space or managing of safety is maintained between sterile and non-sterile objects and areas.
- xiv. When pouring fluids only the lip and inner cap of the pouring container is considered sterile; the pouring container should not touch the receiving container and splashing should be avoided.

Tears in barriers and expired sterilization dates are considered breaks in sterility

- i. Prompt removal of wet or soiled dressings
- ii. Prevention of accumulation of bodily fluid drainage.
- iii. Avoidance of backward drainage flow toward patient

- iv. Immediate cleaning up of soiled or moist areas.
- v. Labeling of all fluid containers with date, time and timely disposal per institutional policy.
- vi. Maintaining seals on all fluids when not in use.

SESSION EIGHT –Aseptic technique procedure in clinical settings. (Medical Asepsis)

1. Decontamination
2. Sterilization

To prevent transmission of infections via medical instruments each step of instrument processing i.e., decontamination, cleaning and sterilization or high level disinfection must be done properly

Decontamination - kills many diseases – causing micro-organisms such as hepatitis virus and HIV, making instruments and other items safer for handling during cleaning. Decontamination is performed by soaking used instruments and other items in 0.5% chlorine solution for 10 minutes.

MAKING A CHILORINE SOLUTION

The following formula is use to prepare a dilute chlorine solution from liquid.

%chlorine in solution – 1 =number parts water needed per part chlorine

% chlorine solution desired

Example: to make a 0.5% chlorine solution from bleach with 3.5% active chlorine

3.5% - 1 = 7- 1= 6

0.5%

Thus, add 6 part water to 1 part liquid

Instruments should not be exposed to chlorine for long. A 10 minute time period is sufficient for decontamination. Large surfaces such as examination and operating tables, laboratory bench tops and other equipment that may have come in contact with blood or other body fluids also should be decontaminated. Wiping them

with a suitable disinfected towel or cloth (e.g. 0.5% chlorine or 1-2% phenol) is a practical, inexpensive way to decontaminate these items.

Cleaning

Cleaning instrument with detergent and water removes blood particulate matter and improve the quality of subsequent high-level disinfection or sterilization. A brush should be used for cleaning most instruments and staff members must wear thick utility gloves while cleaning instruments. Sterilization or High-level disinfection, to be effective, both sterilization and high-level disinfection (HLD) must be preceded by decontamination, careful cleaning, and thorough rinsing. When sterilization of instruments is not possible, HLD is the only acceptable alternative.

Sterilization using steam, dry heat, or chemical solution destroys all microorganisms (bacteria, viruses, fungi, and parasites) including bacterial endospores, from instruments and other items. Sterilization is the method recommended for items that come in contact with the blood stream or tissues beneath the skin (surgical and many delivery instruments), jointed instruments such as ring forceps, should be opened or unlocked for sterilization, sterilization can be done using steam (autoclaving), dry heat (oven) or chemical solution. Sterilized items should then be used immediately or store in a sterile, covered container.

I.steam sterilization. Instrument may be sterilized either wrapped or unwrapped

- i. If items are to be wrapped before steam sterilization, two layer of paper wrap or two layers of cotton fabric will be use (do not use canvas);
- ii. The unwrapped items or wrapped packs should be arranged to allow free circulation of steam
- iii. Steam items at 121 degrees C (250 degree F) and 106 kpa pressure (15 ibs/in²). In Steaming 30 minutes is for wrapped, 20 minutes for unwrapped items.

Note: Do not begin timing until the steam sterilizer reaches the desired temperature and pressure. Allow unwrapped items or wrapped packs to dry before removing them from the steam sterilizer. Allow items to cool before storage or use.

Dry Heat Sterilization

- Items can be wrapped in foil or double-layers cotton fabric before dry heat sterilization. - items are sterilize at 170 degree C (340 degree F) for 60 minutes, or 160degrees C (320 degrees F) for 120 minutes.

Note: Do not begin until the oven reaches the desired temperature.

- i. Dry heat can dull sharp instruments and needles. These items should not be sterilized at temperature higher than 160 degrees C.
- ii. Items should be allowed to cool before they are removed from the oven

Chemical Sterilization

- cover all items with correct dilution of glutaraldehyde solution (Cidex); do not use sporicidin for sterilization, or an 8% formaldehyde solution (least desirable because it is dangerous to breathe).

- i. Jointed instruments such as forceps should be opened or unlocked.
- ii. soak items for 10 hours for cidex, or 24 hours for formaldehyde, or as per manufactures instructions.
- iii. Nothing should be added to or removed from the chemical solution once timing has begun. After soaking items rinse them with water
- iv. Air dry before use or storage.

SESSION NINE: HIGH LEVEL DISINFECTION

High-level Disinfection (HLD)

If sterilization is not available, high level disinfection is the only acceptable, alternative for preparing instrument and other reusable item for insertion of uterine device (IUD) insertion and other procedures in the health care settings.

- i. High-level disinfection (HLD) is effective in eliminating all microorganisms except some bacterial endospores.
- ii. There are two methods of HLD: boiling and chemical HLD
- iii. After either HLD procedure, items that are not used immediately should be air-dried and stored in a covered disinfected container (for up to one week).

High-Level Disinfection by Steaming

STEPS OF HLD STEAMING

These steps should be followed for steaming Manual Vacuum Aspiration (MVA) cannulae and other materials.

1. Decontaminate the materials to be high-level disinfected.
2. Place water in the bottom tray (which has no holes).
3. Stack the tray (s) of materials on top of the bottom tray.
4. Place the lid on the top tray and bring the water to boil, when steam comes out between the trays, the water is boiling. Reduce the heat, but maintain the water at a rolling boil (steam should continue to come out between the trays). High heat wastes fuel and causes the water to evaporate more quickly.
5. Steam the materials for 20 minutes. Use a timer or make sure to record the time.

Remove each tray, shake off the excess water, and place the tray (s) on a second tray that does not have holes or contain water (a second bottom tray). (Do not place the tray containing the materials directly on the countertop, since this may contaminate them; remember, there are holes in the bottom of the tray.)

6. Use the materials immediately or allow them to dry for 4-6 hours (drying may be difficult in areas of high humidity).

- Storage: store the materials in a covered tray or put them in a high-level disinfected container and use within one week.

Special Considerations for High-level Disinfection

The following items require special attention. To high-level disinfect them, the procedures listed below is followed

Item	HLD procure
Linen (caps, gowns, masks, and surgical drapes)	Linen should be steam-sterilized HLD of linens is impractical. And HLD by boiling is impractical, since drying would be necessary, HLD using chemicals is impractical, since rinsing with boiled water and drying would be necessary.
Instruments used during manual vacuum aspiration	Syringe: HLD of the syringe after decontamination and proper cleaning is not necessary because it does not come in contact with the client and is used only as a source of vacuum and as a Receptacle for blood/tissue. In addition, HLD may actually
(MVA)	<ul style="list-style-type: none"> Decrease the life of the syringe, since HLD damages the syringe over time. If your facility requires HLD of the syringe, soak it in a 0.5% chlorine solution. Be sure that all parts of the syringe are completely submerged and that the barrel is filled with the solution. Cannula: if sterilization of the cannula is not possible, it may be high-level disinfected by boiling, soaking in chemicals, or steaming. Boiling: Research has shown that the cannula does not need to be submerged in the water for HLD by boiling to be effective. However, the pot/boiler must be kept covered. Chemical: completely fill and submerge the cannula in a solution that contains glutaraldehyde or in a 0.5% chlorine solution. Steaming: follow the recommended steps.

Adapted from infection prevention manual JHIEGO (1991)

Steps of processing instruments.

- Boiling

- i Completely immerse items in water. Cover and boil for 20 minutes (start timing when the water begins to boil).
- ii Jointed Instruments, such as ring forceps, should be opened or unlocked during HLD.
- iii All items must be completely covered during boiling (place items that float in a weighted, porous bag).
- iv Do not add anything to the pot after the water begins to boil.
- v Air-dry before use or storage.

II. Chemical HLD

- i Cover all items with correct dilution of properly stored disinfectant:
 - Glutaraldehyde solution
 - 0.5% or 0.1% chlorine solution
 - 8% formaldehyde solution
- ii Joined instruments, such as ring forceps, should be opened or unlocked
- iii Soak items for 20 minutes or as per manufacturer's instructions
- iv Nothing should be added to or removed from the chemical solution once timing has begun. After soaking items, rinse them with boiled water.
- v Air dry before use or storage

Storage of Processed Equipment and Instruments

Proper storage of HLD or sterilized items is as important as the HLD or sterilization process itself.

- i. Items should be stored dry
- ii. If possible, store processed items in an enclosed cabinet

- iii. Do not store pick-up (chittles) forceps in a bottle filled with antiseptic solution.
- iv. (Microorganisms will multiply in the standing solution even if an antiseptic has been added).
- v. HLD or sterilize pick-up forceps each day and store them dry in a high level disinfected or sterile bottle.
 - a. Wrapped items must be considered contaminated when:
 - b. The package is torn or damaged
 - c. The wrapping is wet
- vi. The expiration date is exceeded
- vii. Wrapped items can be used for up to one week. Wrapped items sealed in plastic can be used for up to one month.

Unwrapped items must be used immediately or stored in a covered sterile or HLD container (for up to one week).

SESSION TEN: OVERALL REVIEW

Participants will share experiences of common injuries that occur while in practicing at the facilities and identify the correct aseptic techniques that they should have follow in preventing those injuries to prevent future occurrences.

The use of PPE and aseptic technique of the participants will be evaluated. The participant will also be encouraged to have positive attitude to the use of aseptic techniques in their daily activities in the hospital setting. There will be an interactive session between the researcher and the participants to ascertain the effect of the therapeutic programme. Activities of the previous sessions will be role played to be sure they have attained positive experience via the intervention, after which post-test instruments will be administered to participants.

APPENDIX IV
MATERNAL AND CHILD HEALTH TRAINING PACKAGE FOR
CONTROL GROUP

SESSION 1 : ADMINISTRATION OF PRE-TEST INSTRUMENT

The purpose of this session is to administer the questionnaire on the participants so as to determine the ability of the health workers who will benefit from the training. The researcher will familiarize with the member of the group and welcome them warmly into the programme. The participant will be informed that they will be having 10 sessions of 2 hours each for a period of 10 weeks. The researcher will explain the reason for the programme and what the participants stand to benefit at the end of the programme. The researcher will explain the rule guiding the conduct of the programme and what is expected of the participants. The researcher will administer the pre-test instruments to the participants.

SESSION TWO: MATERNAL AND CHILD HEALTH (MCH)

Maternal and child health (MCH) care is the health service provided to mothers (women in their child bearing age) and children. The targets for MCH are all women in their reproductive age groups, i.e., 15 - 49 years of age, children, school age population and adolescents.

IMPORTANCE OF MATERNAL AND CHILD HEALTH CARE

The care of mothers and children needs major consideration and should be part of every programme that is taking care of people's health because ;

1. Mothers and children make up over 2/3 of the whole population. Women in reproductive age (15 – 49) constitute 21%, pregnant women, 4.5%, children under 5, 47%, children under 5, 18%, under 3: 12% and infants: 4%.
2. Maternal mortality is an adverse outcome of many pregnancies. Miscarriage, induced abortion, and other factors, are causes for over 40 percent of the pregnancies in developing countries which result in complications, illnesses, or permanent disability for the mother or child. About 80 percent of maternal deaths are in directed obstetric deaths. They result "from obstetric complications of the pregnant state

(pregnancy, labour, and puerperium), from intervention, omissions, incorrect treatment, or from a chain of events resulting from any of the above.

3. Most pregnant women in the developing world receive insufficient or no prenatal care and deliver without help from appropriately trained health care providers. More than 7 million newborn deaths are believed to result from maternal health problems and their mismanagement.

4. Poorly timed unwanted pregnancies carry high risks of morbidity and mortality, as well as social and economic costs, particularly to the adolescent and many unwanted pregnancies end in unsafe abortion.

5. Poor maternal health hurts women's productivity, their families' welfare, and socio-economic development.

6. Large number of women suffers severe chronic illnesses that can be exacerbated by pregnancy and the mother's weakened immune system and levels of these illnesses are extremely high.

7. Infectious diseases like malaria are more prevalent in pregnant women than in non-pregnant women (most common in the first pregnancy). In addition, an increasing number of pregnant women are testing positive for the human immunodeficiency virus. In Sub-Saharan Africa, 3 million women are estimated to be infected with the AIDS virus and a woman with HIV has a 25 to 40 percent chance of passing the infection on to her fetus in the womb or at birth.

8. Many women suffer pregnancy-related disabilities like uterine prolapse long after delivery due to early marriage and child bearing and high fertility.

9. Nutritional problems are severe among pregnant mothers and 60 to 70 percent of pregnant women in developing countries are estimated to be anaemic. Women with poor nutritional status are more likely to deliver a low-birth -weight infant.

10. Majority of perinatal deaths are associated with maternal complications, poor management techniques during labour and delivery, and maternal health and nutritional status before and during pregnancy.

11. The large majority of pregnancies that end in a maternal death also result in fetal or perinatal death. Among infants who survive the death of the mother, fewer than 10 percent live beyond their first birthday.

12. Ante partum haemorrhage, eclampsia, and other complications are associated with large number of perinatal deaths each year in developing countries plus considerable suffering and poor growth and development for those infants who survive.

13. Children due to poor management during labour and delivery develop one impairment or other complications

14. Low birth weight babies. Because many women are fed less, marry early, carry a heavy workload, and spend a considerable portion of their lifespan in pregnancy and lactation, they are exposed to persistent low nutritional status and high-energy expenditure. This predisposes mothers to bear low-birth-weight infants.

15. Women often lack access to relevant information, trained providers and supplies, emergency transport, and other essential services.

16. Cultural attitudes and practices impede women's use of services that are available.

17. Children whose earliest years are faced by hunger or disease or whose minds are not stimulated by appropriate interaction with adults and their environment will experience grave and negative consequence throughout their lives-and so does society as they would be less contributory member. The specific objectives of MCH Care focuses on the reduction of maternal, perinatal, infant and childhood mortality and morbidity and the promotion of reproductive health and the physical and psychosocial development of the child and adolescent within the family.

SESSION THREE–MATERNAL HEALTH AND PROBLEMS

Maternal health is the health of women during pregnancy, childbirth, and the postpartum period. It encompasses the health care dimensions of family planning, preconception, prenatal, and postnatal care in order to ensure a positive and fulfilling experience in most cases and reduce maternal morbidity and mortality in other cases. More than 150 million women become pregnant in developing countries each year and an estimated 500,000 of them die from pregnancy-related causes. Maternal health problems are also the causes for more than seven million pregnancies to result in stillbirths or infant deaths within the first week of life. Maternal death, of a woman in reproductive age, has a further impact by causing grave economic and social hardship for her family and community. Other than their health problems most women in the

developing countries lack access to modern health care services and increases the magnitude of death from preventable problems.

Factors Affecting Health Status of Mothers

The major determinants of maternal morbidity and mortality include pregnancy, the development of pregnancy-related complications, including complications from abortion and, the management of pregnancy, delivery, and the postpartum period. However, a lot of factors contribute to the low health status of women in the developing countries including Nigeria.

These factors include:

- i. Socio economic development of the country has serious Impact on morbidity and mortality.
- ii. Poor agricultural development results in inadequate household food and has direct influence on nutritional status of mothers.
- iii. Poor sanitary environment, poor housing, unsafe and inadequate water, adverse social and physical environment.
- iv. Access to health services. Lack of access to modern health care services has great impact on increasing maternal death. Most pregnant women do not receive antenatal care; deliver without the assistance of trained health workers etc..
- v. Access to education. In many countries women have poor education and 2/3 of illiterate adults are women. Education is proved to have significant effect on women's health and reproductive behaviour through its influence on age at marriage, contraception and health care use, and awareness of risks and danger signs.
- vi. Women's reproductive and health behaviour.
- vii. Access to and control of income and resources. Women's income, access to household resources, and power to make decisions influence their ability to seek and utilize health services.
- viii. Political commitment, is crucial to allocate the available resources and to provide services which are accessible to those most in need.
- ix. Low social status of women. The health and well being of women is related and highly influenced with their social status.

SESSION FOUR :MATERNAL MORTALITY AND MORBIDITY

Maternal mortality is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy irrespective of the site and duration of pregnancy from any acutely related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. Maternal mortality is the leading cause of death among women of reproductive age in most of the developing world. Globally, an estimated 500,000 women die as a result of pregnancy each year. Maternal mortality in developing countries is given least attention, despite the, fact that almost all of the suffering and death is preventable with proper management.

Maternal mortality constitutes a small part of the larger maternal morbidity and suffering, because for every maternal death there are a lot of women suffering from acute and chronic illnesses during pregnancy,

Major causes of maternal mortality

There are five major causes of maternal mortality, especially in the developing countries. These are

- i. Haemorrhage (25)%
- ii. Infection (Sepsis 15%, indirect causes 19%)
- iii. Hypertensive disorders of pregnancy (12%)
- iv. Obstructed labour (8%)
- v. Abortion (13%)
- vi. Others (8%)

Haemorrhage

It can occur during pregnancy, delivery and post partum period. During pregnancy it can occur at the

- 1st trimester due to abortion
- 2nd trimester due to placental location and pre term labour
- 3rd trimester due to abnormal placental location, premature separation of placenta, and premature labour

Infection

Infection is prevalent among the disadvantaged and risk increases by factors like anaemia, malaria, goitre, and malnutrition. Maternal infection is a serious problem as a result of the vicious cycle caused by low caloric intake, heavy workload and

infection. It is also compounded by pregnancies at young age and too many pregnancies too close together. Poverty also perpetuates the problem through illiteracy, poor sanitation, inadequate housing (crowding), and Inadequate and unsafe water. This infections can occur during pregnancy or after birth and this include

a. Puerperal Sepsis

Puerperal sepsis occurs following long and complicated deliveries and it is rare in uncomplicated spontaneous delivery. Sepsis is also very common after unsafe abortion. Usually sepsis is fatal when the mother's condition is compromised due to difficult labour and severe bleeding.

b. Malaria

Malaria is cause of severe under weight during birth and 3 million infants are affected in Africa. It is common at first pregnancy. During pregnancy the risk of getting malaria increases two times and the risk for cerebral malaria is high. During pregnancy malaria is also the cause of, severe anaemia, Spontaneous abortion, Pre mature labour, still birth, and low birth weight. Wherever malaria is common pregnant women should take anti malarial tablets throughout pregnancy. Anaemic women due to malaria face, risk during child bearing, less tolerance to blood loss (bleeding,), risk for anaesthesia and operative delivery, poor pregnancy outcome, bleeding, illness, and death during delivery, Still birth, Poor foetal growth, Pre term labour, Low birth weight (serious effect on infancy) ,When anaemia is severe pregnant mothers face (directly) congestive heart failure and haemorrhage (indirectly). This can happen in 3-9% of pregnant mothers. In moderate cases of anaemia there will be poor ability to recover form haemorrhage and infection

c. Hepatitis

Hepatitis A is related with socio economic status and usually women of low socio economic status (SES) are susceptible as a result of poor hygienic conditions. Faecal contamination of food & water are responsible as the mode of transmission. Incidence during pregnancy increases two times and pregnant are more seriously ill and likely to die than non-pregnant women. Premature labour, liver failure, and sever haemorrhage are common complications of severe hepatitis.

d. Sexually Transmitted Diseases and Pelvic Infections

Sexually transmitted diseases and pelvic infections have grave consequence on mother and child. They can result from, sexual activity, poor obstetric and gynaecological practices specially associated with Induced abortion, spontaneous abortion and childbirth. Fatality depends on the type of organism and the organs affected. Its effects and complications include: Tubal scarring leading to infertility, Ectopic pregnancy, spontaneous abortion, pre mature rupture of membrane, congenital anomalies such as blindness, and mental retardation etc.

e. Acquired Immuno Deficiency Syndrome (AIDS)

The spread of AIDS is increasing and rapid specially in sub-Saharan Africa and other developing countries putting stress on the already strained health care system. Magnitude. According to the WHO estimate 16,000 people are infected every day and there are 3 million infected women and it is becoming a serious threat and alarmingly increasing in pregnancy. In countries like Rwanda 18.30% of women who came for Ante Natal Care were found to be HIV positive in a routine screening. This condition is further aggravated as a woman with AIDS has a 25-40% chance of passing on HIV in the womb or at birth (the number of children born with HIV is reported to be 3.8million)

SESSION FIVE: MAJOR CAUSES OF MATERNAL MORTALITY

Obstructed Labour

Obstructed labour occurs when there is no advance of the presenting part despite good uterine contraction. Teenage pregnancy is a serious risk factor and mostly occurs in first delivery. Thus it is mainly the problem of early adolescent pregnancy. Between 1 and 13 percent of pregnant women suffer prolonged or obstructed labour, though the level of obstructed labour varies by country. Obstructed labour can result not only in maternal death, but also in fetal death due to infection, birth injury, or asphyxia.

2. Problems of Fistula

One of the worst consequences of childbirth is vesico-vaginal fistula (VVF) or holes that develop between the vagina and urinary tract and/or rectum. VVF is commonly due to obstructed labour, which is most common among women who are stunted due to chronic malnutrition or untreated infections in childhood and adolescence, or among women experiencing their first pregnancy at a young age, prior to complete pelvic

growth. Women who suffer VVF continuously leak urine, and sometimes feces. They typically become social outcasts; divorced and rejected, they often travel long distances in search of treatment.

4. Hypertensive Disorders of Pregnancy (Toxaemia of Pregnancy)

These include eclampsia and pre-eclampsia, which are occurring only during pregnancy (after 20 weeks gestation) as a result of pregnancy induced hypertension. Early stage pre-eclampsia, characterized by high blood pressure, generalized edema (swelling), and excess protein in the urine, may arise in the second or third trimester and is most common among primiparas.

Eclampsia is characterized by very high blood pressure, convulsions, and possible cerebral haemorrhage. Untreated pre-eclampsia leads to eclampsia in less than 1 percent of pregnant women, but the condition is serious and the outcome poor. Immediate transfer and treatment,

including expedited delivery, are required. Between 5 and 17 percent of eclampsia victims die, and those who survive may suffer paralysis, blindness, or chronic hypertension and

kidney damage. Eclampsia can happen at any time during the latter part of pregnancy, it

can and often does result in fetal death or the birth of a premature infant at high risk of death. Hypertension and pre-eclampsia can also result in low-birth-weight infants or fetal death..

5- Abortion

Abortion Is termination of pregnancy before the foetus is capable of extra uterine life.

Depending on the cause abortion is classified

1. Spontaneous abortion (commonly known as miscarriage) which is unprovoked termination of pregnancy.
2. Induced abortion due to deliberate interference. It can be performed
Either a) In accordance with legal sanctions b) Out side of the law
3. Therapeutic abortion, which is performed exclusively for medical reasons specially when a) Danger to mother's health is high if pregnancy continues
b) If foetus is threatened with congenital and genetic abnormalities

Access to information is very minimal for adolescents due to illiteracy.

6. Female Genital Mutilation

(Female Circumcision)

Female circumcision or female genital mutilation is one of the serious causes of maternal morbidity and mortality. As the mutilated area can cause prolonged labour or excessive tear during delivery leading to infections and fistula.

SESSION SIX : MATERNAL HEALTH SERVICES

This are health services for mothers to prevent maternal mortality and morbidity. The services include

1 family planning ,2 Pre natal or Ante natal care (ANC), 3 Delivery .4 Post natal care
Four elements are essential to maternal death prevention. First, prenatal care. It is recommended that expectant mothers receive at least four antenatal visits to check and monitor the health of mother and foetus. Second, skilled birth attendance with emergency backup such as doctors, nurses and midwives who have the skills to manage normal deliveries and recognize the onset of complications. Third, emergency obstetric care to address the major causes of maternal death which are haemorrhage, sepsis, unsafe abortion, hypertensive disorders and obstructed labour. Lastly, postnatal care which is the six weeks following delivery. During this time bleeding, sepsis and hypertensive disorders can occur and newborns are extremely vulnerable in the immediate aftermath of birth. Therefore, follow-up visits by a health worker is assess the health of both mother and child in the postnatal period is strongly recommended.

Family Planning is a means of:

- Promoting the health of women and families and part of a strategy to reduce the high MMR, IMR, and CMR.
- Preventing maternal mortality by reducing exposure to pregnancy and therefore to risks associated with pregnancy and childbirth in the event of wanted births
- Preventing pregnancy and abortion when pregnancy is unwanted. Based on the above factors family planning programmes can be taken as the means to offer the service, to all who desire it, the opportunity to determine when to have children, the number of their children and spacing of births.

Ante Natal Care (ANC) is the care given to pregnant mothers that they have safe pregnancy and healthy baby. It also helps in minimizing complications of pregnancy, labour the post partum and neonatal periods. The purpose of ANC is to care for pregnant mothers and to have all births attended by trained health workers, and to identify pregnancies where risk is high and provide special care for the mother and the infant. There is a large body of evidence from routine statistics and special studies to suggest that women who have received prenatal care experience lower rates of maternal mortality.

Delivery Care Service

The most elementary knowledge in delivery care is the The 3 c's

- i. Clean hands
- ii. Clean delivery service
- iii. Clean cutting of the cord
- iv. Always discuss with TTBA's
- v. To prepare in Advance
- vi. To avoid massage
- vii. To avoid vaginal examination
- viii. About handling of the cord
- ix. About care for the newborn
- x. About referral
- xi. About recording. (Recording is a compulsory for all health workers at all Levels) and

SESSION SEVEN: POST NATAL CARE

Post Natal Care (PNC) a care up to six weeks in the post partum period. Incorrectly given least attention and usually neglected.

PNC - first day after delivery

PNC - from first day to 6 weeks

During postnatal care always give equal attention and care for both the mother and the new born

Objectives of postnatal clinic:

- i. Observe physical status
- ii. Advise, and support on breast-feeding
- iii. Advise on Family Planning
- iv. Provide emotional support
- v. Health education on weaning and food preparation.
- vi. Discussion about menstruation (when it will restart) and when to start sexual relation (this point is usually overlooked in post natal clinics)

SESSION EIGHT CHILD HEALTH CARE

A child means “.... every human being below the age of eighteen years, unless under the law applicable to the child, majority is attained earlier.”

Every year 13 million children die from preventable diseases. More than 60% are due to

- i. Pneumonia: 3.6 million
 - ii. Diarrhoea diseases: 3 million
 - iii. Vaccine preventable diseases and combination of the three: 2.1 million
- Among these deaths 75% are preventable by immunisation and improved management of diarrhoea. Perinatal mortality is the number of late foetal deaths (also called still births) and early neonatal deaths (before day 7 (168 hours) per 1000 births. Deaths of all foetuses and new-borns with at birth weight of 500 gms (gestational age of 22 weeks or crown-heel length of 25 cm, when birthweight is not known), whether alive or dead, should be considered as perinatal. Adequate care during pregnancy and delivery goes a long way to reduce perinatal death.

Child care is also important as most children don't reach the age of five before they die to prevent this breast feeding exclusively is important till 6 month of age, growth monitoring to see if the child is not malnourished, one of the most neglected services which is often forgotten is screening. It is a very important activity which has to be carried out every day in all institutions delivering child health services. There is an immense benefit for children, as well as to their mothers, by the brief assessment (history and physical examination) at every visit to the clinic. Screening is an important tool to avoid “missed opportunities. The need for vaccination, growth

monitoring as well as mothers' need in terms of antenatal care, familyplanning etc. can be easily identified.

SESSION NINE: Expanded Program On Immunization (EPI) IN CHILD CARE

Immunization is the process of protecting a person from a specific disease. It is protection of a susceptible host from a specific disease by administration of

- i. A living modified agent
- ii. A suspension of killed organism
- iii. An attenuated toxin.

Immunization decreases susceptibility by producing antibodies or sensitized cells to fight the agent and its product.

Types of Immunization

- i. Active - Vaccine which acts in place of natural antigen
- ii. Passive - ready-made antibodies and our body do not take in the making. E.g. foetus, TAT, snake antiserum.

Another classification can be:

- i. Natural such as Mother to foetus, infection
 - ii. Artificially induced immunization such as vaccine (antigen), antibodies
- Maternal and Child Health Care 68

Herd Immunity

Herd immunity indicate that large proportion of people in a certain community are immune. The implication is when there are few susceptible, the natural infection cannot keep going in the community and incidence goes down to a low level. For Immunization to be effective in controlling communicable disease 75% of the population and 75% of new-born have to be vaccinated.

Discontinuing vaccination programs have serious risk of causing an epidemic.

Objectives of EPI

1. To reduce morbidity and mortality from nine major diseases - diphtheria, pertussis, tetanus, measles, yellow fever, hepatitis B, PCV poliomyelitis and tuberculosis by immunizing all children throughout the world
2. To promote national self-reliance in delivering immunization services within comprehensive health services.

3. To promote regional self-reliance in vaccine production and quality control.

SESSION TEN: OVERALL REVIEW

Participants will share experiences of ANC services that occur while practicing at the facilities and identify where they've been able to achieve the aim of health care. The participant will also be encouraged to have positive attitude to the care of pregnant woman and babies at the facilities. There will be an interactive session between the researcher and the participants to ascertain the effect of the therapeutic programme. Activities of the previous sessions will be role played to be sure they have attained positive experience via the intervention, after which post-test instruments will be administered to participants.

APPENDIX V

Department of Human Kinetics and Health Education,
Faculty of Education,
University of Ibadan, Ibadan.

The Chairman
Social Sciences and Humanities
Research Ethics Committee (SSHEC)
University of Ibadan
Ibadan.

Dear Sir,

APPLICATION FOR ETHICAL REVIEW OF RESEARCH

I hereby apply for an ethical review of my research proposal titled “Effects of Aseptic Technique Education on Cognition, Attitude and Work Related Risk Reduction Practices Among Community Health Workers in Oyo State. I am currently a PhD student (Health and safety Education) of the Department of Human Kinetics and Health Education, Faculty of Education, University of Ibadan and have proposed this topic as my area of interest.

This research is quasi-experimental research and a pretest posttest control group quasi-experimental design adopted. The research will be conducted among health workers working at the primary health care level as part of my requirement to earn a doctoral degree and to also contribute a significant knowledge to the existing body of knowledge through the use of an intervention programme as it contributes to reduction in spread of infection among health workers and the nation as a whole.

Hence this research is therefore sent to your committee for review while the field work shall commence as soon as it has been approved. Thank you for prompt response to this application.

Yours faithfully,

Ogunmola Patricia .O.

APPENDIX VI

To be completed in Duplicate:

IRB Research approval number (UI/SSHE/2016/ 0044)

Title of research : Effect of Aseptic Technique Education on Cognition, Attitude and Work Related Risk Reduction Practices Among Community Health Workers in Oyo State.

Name : This study is being conducted by Patricia Olusayo OGUNMOLA of the Department of Human Kinetics and health Education, University of Ibadan.

Purpose of research: To know the effect that aseptic technique education (training package) will have on cognition, attitude and work related risk reduction practices variables of community health workers in Oyo state.

Procedure of research(s): Participants will be recruited using simple random sampling techniques and through a process of volunteer and shall be assigned into two groups (experimental and control group). Two participants will be recruited for the study,each participants in the experimental group will undergo aseptic technique training, while the control group will be given placebo of maternal and child health education.

Expected duration of research: you are expected to be involved in this research for a period of 10 weeks for a period of 2 hours once a week at a venue that will be agreed upon by participants.

After being briefed by the researcher on the modality of the research, I express my willingness to participate in the research as participants.

I voluntarily submit myself to the constraints and control of the research procedure, abide strictly by the instructions provided by the research, cooperate fully in the experiment and do my possible best to assist the researcher, collect reliable data for the research.

I

(Name in full with phone no)

.....

Signature of Participant

Date.....

.....

Signature of Investigator

Date.....

.....

Signature of Witness and Date.

APPENDIX VII

UNIVERSITY OF IBADAN, IBADAN, NIGERIA

DEPARTMENT OF HUMAN KINETICS AND HEALTH EDUCATION

Head of Department
Prof. Michael Adeniyi Ajayi
NCE (Ife), B.Ed. (Benin), M.Ed., Ph.D (Ibadan)
Sports Psychology & Leisure Studies



E-mail: Michael.ajayi@uniben.edu
08023924995

Our Ref: _____

Date 3rd Nov 2016

Your Ref: _____

Dear Sir,

PERMISSION TO COLLECT DATA/INFORMATION/CARRY EXPERIMENT

The bearer Deborah Patricia O with matric no. 153060 is a Ph.D student in the Department of Human Kinetics and Health Education, University of Ibadan, Ibadan.

He/She needs to collect data/information/carry out experiment in your Department/Unit for his/her/ Project/Course work.

Kindly allow him/her all necessary assistance required.

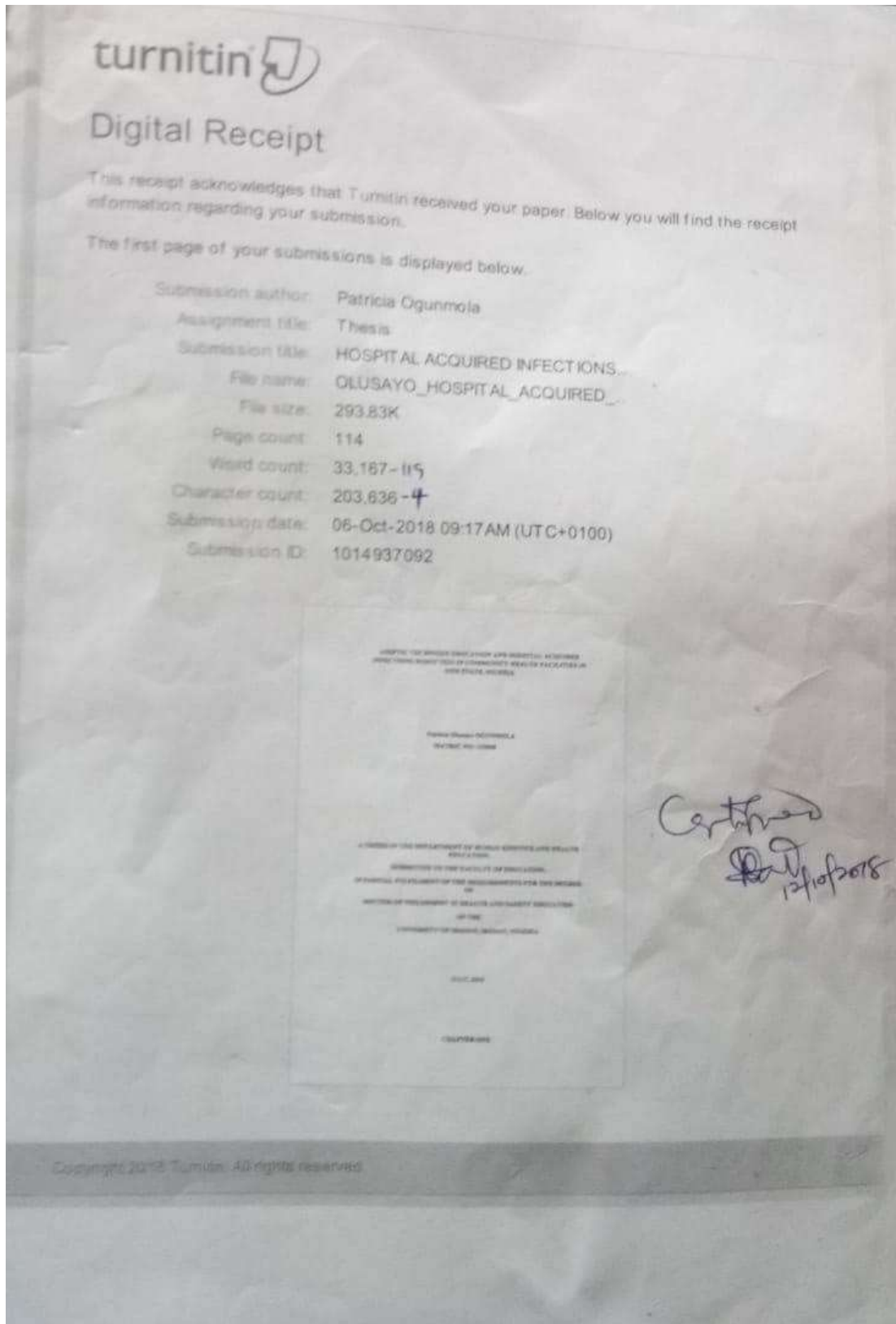


- 1. _____ (Health Education/Promotion)
- 2. _____ (Health Education/Promotion & Curriculum Studies)
- 3. S.O. Adigun (Organisation & Administration of Sports)
- 4. J.F. Sabata (Exercise Physiology)
- 5. A.O. Akintola (Exercise Physiology)

Staff:

- Dr. E.O. Wolekele (Organisation & Administration of Sports)
- Dr. C.A. Adigun (Sports Performance)
- Dr. A.O. Padejo (Sports Performance)
- Dr. Fredrick C. Anasazu (Health Education)

APPENDIX VIII



HOSPITAL ACQUIRED INFECTIONS REDUCTION

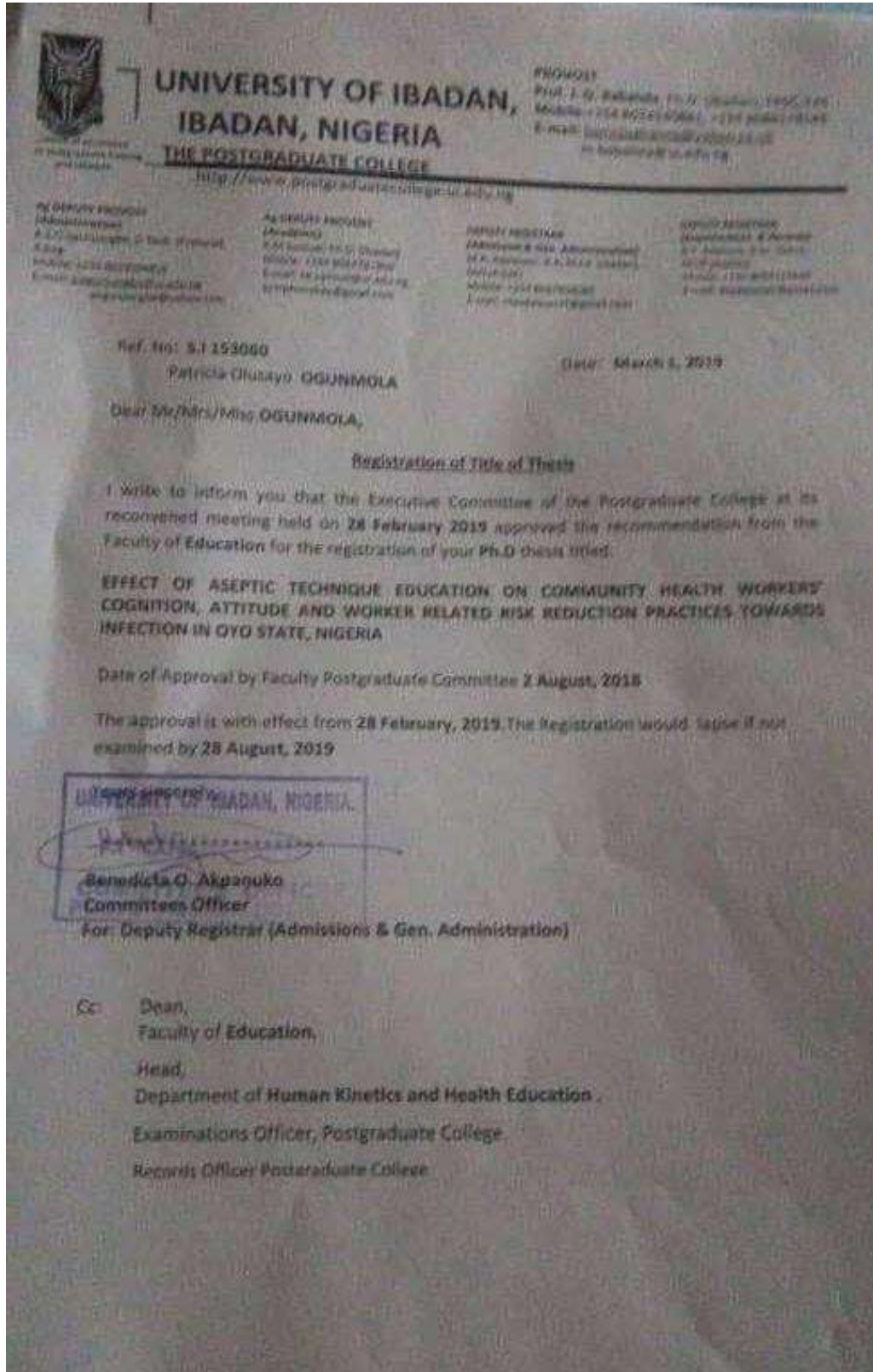
ORIGINALITY REPORT

20%	14%	7%	11%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Eiffel Corporation Student Paper	3%
2	medcraveonline.com Internet Source	2%
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8	www.accesscontinuingeducation.com Internet Source	<1%
9	muschealth.com	

APPENDIX IX



APPENDIX X



**SOCIAL SCIENCES AND HUMANITIES RESEARCH ETHICS COMMITTEE (SSHEC)
UNIVERSITY OF IBADAN**

Chairman: Prof. A. S. Jegede, B.Sc, M.Sc (Ife), MHSc (Toronto), Ph.d (Ibadan)

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NOTICE OF FULL APPROVAL AFTER FULL COMMITTEE REVIEW

**RE: EFFECT OF ASEPTIC TECHNIQUE EDUCATION ON COGNITION, ATTITUDE
AND WORK RELATED RISK REDUCTION PRACTICES AMONG COMMUNITY
HEALTH WORKERS IN OYO STATE.**

UI/Social Sciences Ethics Committee assigned number: UI/SSHEC/2016/0044

Name of Principal Investigator:	Patricia Olusola OGUNMOLA
Address of Principal Investigator:	Human Kinetics & Health Education, Faculty of Education, University of Ibadan.

Date of receipt of valid application: 09/11/2016

Date of meeting when final determination on ethical approval was made: 14th July, 2017.

This is to inform you that the research described in the submitted protocol, the consent forms, and other participant information materials have been reviewed and given full approval by the SSHE Committee.

This approval dates from 14/07/2017 to 13/07/2018. If there is delay in starting the research, please inform the SSHE Committee so that the dates of approval can be adjusted accordingly. Note that no participant accrual or activity related to this research may be conducted outside of these dates. All informed consent forms used in this study must carry the SSHE Committee assigned number and duration of SSHE Committee approval of the study. It is expected that you submit your annual report as well as an annual request for the project renewal to the SSHE Committee early in order to obtain renewal of your approval to avoid disruption of your research.

Note: the National code for health research ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the Code including ensuring that all adverse events are reported promptly to the SSHEC. No changes are permitted in the research without prior approval by the SSHEC except in circumstances outlined in the Code. The SSHE reserves the right to conduct compliance visit to your research site without previous notification.

A handwritten signature in black ink, appearing to read 'A. S. Jegede', written over a horizontal line.

Prof. A.S. Jegede

APPENDIX XI



- a. **The medical officer of health declaring the training programme opened at Agbongbon PHC with the researcher's supervisor on her right and the researcher on her left**



- b. **Cross section of participants in the experimental group during pre-test administration**



c. Group photograph at the end of the opening ceremony at Agbongbon PHC, Agbongbon, Ibadan



d. Cross section of participants in the experimental group during post-test administration



e. Interview session with one of the FGD participants



f. Registration of participants in the control group at Comprehensive Model Cente, Sunsun, Ogbomoso



g. Cross section of the participants in control group during one of the sessions



h. Cross section of participants in the control group during pre-test administration

