

The Perception of Healthcare Workers Toward Infection Prevention and Control Practices in Two Hospitals in Bo City

Prince T. Lamin-Boima

Milton Margai College Of Education And Technology

DOI: 10.29322/IJSRP.9.11.2019.p9568

<http://dx.doi.org/10.29322/IJSRP.9.11.2019.p9568>

Abstract- Infection Prevention and Control (IPC) practices are kin practices and essential to excellence health care setting. It attends to issues associated to and from staff to patient or among staff. An infection Prevention and Control practice is something we cannot do without if we want to ensure a safe health delivery services and limit the spread of infections in the health-care setting or /and the community thereby, minimizing the risk of spreading infections. This research seeks to assess the perception of healthcare workers on IPC practices in two hospitals in Bo City.

A descriptive cross-sectional study design, qualitative and quantitative data collection methods were used. In-depth interviews were conducted in the two hospitals with one hundred and forty (140) respondents. Using a structured self-administered questionnaire and a participatory discussion the data was collected.

The study discovered that the greater part of junior nurses lack awareness of infection control principles. Factors that slow down nurses from proper infection prevention and control practice includes; lack of knowledge, forgetfulness, lack of time and lack of resources were identified. The study showed high levels of awareness in IPC practices due to lack of information on IPC. It was also found that most available resources for IPC practices were gloves 67.7% and compliance with IPC guidelines were reasonable. From the findings of the current study, it can be concluded that, despite performing well in knowledge and showing a positive attitude towards infection prevention and control, health care workers (HCWs) had unsatisfactory practice levels regarding infection prevention and control. The majority 60.71% (85) was knowledgeable with high knowledge; followed by 28.57% (40) who had some knowledge and 10.71% (15) had low knowledge. HCWs had sub-optimal 55% (77) low compliance levels with standard infection control guidelines and 45 % (63) of all participants had high level of compliance with all infection control policies. 31.43% (44) of the respondents had never attended any IPC training workshop and 68.57% (96) had attended workshops. Hence, it is needful for policy makers and administrators to provide both human and material resources as well as provide timely and well planned in-service training to the health care workers. Strengthening infection prevention and control practice through regular in-service training/workshop; ensure that resources are available all the time, observing health care workers' practices and provide feedback will be of great help.

Index Terms- Access, Attitudes, Availability, Compliance, infection prevention and control, Knowledge, Practices.

I. INTRODUCTION

T1.1 BACKGROUD INFORMATION TO STUDY

The total population of Sierra Leone is 7,076,641 in millions. The official language of the country is English but locally Krio and Temne is widely spoken (UNDP, 2015b). The life expectancy at birth is 50 years both male and female (WHO-Sierra Leone, 2016a). The country's public health expenditure rate in percentage of Gross Domestic Product (GDP) is approximately 11.8%. The percentage of expenditure is relatively high compared to other countries (UNDP, 2015a).

However, the healthcare system is very poorly structured with high percentage of communicable burden of diseases by 70% and 30% of non-communicable diseases (WHO-Sierra Leone, 2016a). Number of doctors is significantly low; there are only 4 out of 100,000 people (WHO-Sierra Leone, 2016a). Clark (2011) asserts that nurses have so many factors that impede them from proper practice of IPC. A study on this problems and solutions, found that 36% of the nurses had problems in forgetting to practice the sterile technique and 44% lacked knowledge on infection control principles. As a result of this, supporting the in-service training among nurses to with the new trends and developments of infection control and sterile technique principles in order to become increasingly efficient and effective at preventing infections.

A successful (IPC) program is essential to quality health care because the potential benefits of reducing disease burden on patients, health institutions and the nation as a whole (MOH/GHS, 2009). In the last two decades, healthcare associated infections have been recognized as a significant problem in terms of quality of care and cost to patients/clients, healthcare facilities and governments. Health care associated infections have long been recognized as critical factors affecting the quality and outcomes of health care delivery. IPC is an essential, ongoing requirement to protect the communities, patients and health care workers (HCWs) from the spread of infectious. The Ebola virus disease (Ebola) epidemic in Sierra Leone highlighted how actions in health care settings can contain or amplify an epidemic threat in a community. The first cases in the region were recognized in Guinea in March 2014 and consequently spread across the border.

Early in the outbreak, several groups of EVD were reported in health facilities all over the country which occurred in portions due to poor infection prevention and control (IPC) practices. The first cases in the region were recognized in Guinea in March 2014 and consequently spread across the border. These first cases in the country and, several clusters of EVD reported in healthcare facilities were due to poor infection prevention and control (IPC) practices. Infection-related diseases are still the main cause of death in Sierra Leone, with a burden of HIV, TB, Hepatitis, Typhoid, Malaria, respiratory infections and other infectious conditions. Preventing transmission from affected patients to the community and the implementation of IPC best standards practices has been one of the pillars of the response to the Ebola outbreak.

Early in the epidemic, several groups of EVD were reported in healthcare facilities all over the country which occurred in fragment due to poor infection prevention and control (IPC) practices. Sierra Leone was profoundly impacted by the Ebola virus disease (EVD) epidemic in West Africa, documenting 14 122 cases and 3955 deaths. It's first confirmed was in 24th May 2014. According to WHO-Sierra Leone, the cumulative confirmed cases are 8,706 and registered deaths are 3,590 from the data recorded until 27th March 2016. The initial outbreak in Kailahun, the eastern districts of Sierra Leone spread to all districts. The incidence among healthcare workers (HCWs) became 100 times that of the general population, leading to the deaths of nearly 10% of the workforce. Lack of IPC policies, strategies and trained professionals also add to the extent of the problem. The EVD outbreak in Sierra Leone is extraordinary in many ways, including the high number of doctors, nurses, and other healthcare workers who have been infected. This has had a overwhelming impact on the already fragile health workforces of the country.

According to Sydnor & Perl (2011) Infectious patients are admitted into hospitals and therefore hospitals have become common settings for transmission of diseases. In hospitals, infected patients are a source of infection transmission to other patients, health workers and visitors. Hand wash is the single most important intervention to prevent transmission of infection and should be a quality standard in all health institutions. An attitude of not washing hands among individuals involved in the provision of health care can increase the rate of hospital-acquired infections. Efficient knowledge, good attitude and best practices by health care workers in infection prevention and control may contribute to decreasing in infection rate in the hospital. In the last two decades, healthcare associated infections have been recognized as a significant problem in terms of quality of care and cost to patients/clients, healthcare facilities and governments. Health care associated infections have long been recognized as critical factors affecting the quality and outcomes of health care delivery. Infection prevention and control is an essential, ongoing requirement to protect the communities, patients and health care workers (HCWs) from the spread of infectious.

1.2 STATEMENT OF THE PROBLEM

The advantage of IPC in high-quality health delivery and attain patient satisfaction ensures less expenditure on health care in any country. The World Health Organization (2009), estimate that 5% to 10% of patients, will be acquired one or more infection

within health care settings, the risk reminds higher in developing countries. Their role to prevention and control of infection spread is critical in nursing process especially in patient care. This is mainly for junior nurses who are doing most of the work in the wards because of acute shortage of skilled competent. The nurses may do the work hurriedly and in the process, fail to follow correct procedures of preventing infection, thereby putting the patient at risk of acquiring infection in the hospitals. The findings on infection control problems found that 36% of the nurses had problems in forgetting to practice the sterile technique and 44% lacked knowledge on infection control principles. Hence, reinforce the importance of in-service training among nurses to keep them efficient with new trends and developments of infection control and sterile technique principles in order to become more and more efficient and effectual at preventing infections.

Health sector indicators show some making level of progress during the EVD outbreak and experienced a significant decline at a rapid pace particularly in the IPC. The unavailability of supervision and monitoring coupled with inaccessibility of trained staff, and availability of WASH facilities. The World Health Organization reported on the 18 February, HCWs had been reported infected (WHO, 2015). Smith (2009) reported that the factors which hamper nurses from practicing IPC were: lack of knowledge, lack of time to bring proper infection control due to low nurse patient ratio, lack of gear and absentmindedness. Furthermore, Dyer (2010) also highlighted lack of resources as a factor impeding nurses from proper infection control practice. Swanson (2002) pointed out that lack of information is a major factor that impedes in proper infection control practice. He found that most of the nurses have no sufficient input on infection control principles. He further suggests that nurses should get some in service training on the principles.

1.3 JUSTIFICATION OF STUDY

The impact and severity of the Ebola outbreak have had reflective effect on the health sector. An infection Prevention and Control (IPC) practice is the key to health sector policy. The result of this study will ensure excellent client-centered care and maximize protection against infections for all groups of health staff, patients/clients and communities.

The Centers for Disease Control and Prevention approximated that two million patients suffer from hospital-acquired infections every year and nearly 100,000 of them die. Most of these medical errors are preventable. Hospital-acquired infections result in up to \$4.5 billion in additional healthcare expenses annually. In the healthcare setting, the infection control department is classified as non-revenue-producing. Funds dedicated to capital such as staff, educational programs, and prevention procedures are vastly limited. Hospital leaders will need to balance the upfront cost needed to prevent hospital-related infections with the non-reimbursed expense accrued secondary to potentially preventable infections. Infection control and prevention is critical to delivering safe and high-quality care to all when compliance with the Infection prevention and control guidelines.

The result of this study will ensure excellent client-centered care and maximize safety against infections. This study seeks to assess the perception of healthcare workers on IPC practices; in terms of compliance with guidelines, continuity, availability and

access to IPC materials. The result will help guidelines with information on the extent to which non-compliance with IPC practice is prevalent.

1.4 AIM AND OBJECTIVES OF THE STUDY

1.4.1 Aim of Study

This research seeks to assess the perception of healthcare workers on IPC practices in two hospitals in Bo City.

1.4.2 Objectives of Study

The specific objectives of the study are to:

- a. Determine the perception/level of healthcare workers of current Infection Prevention and Control (IPC) practice;
- b. Evaluate the compliance with the dictates of the Infection Prevention and Control Policy by health workers at these facilities;
- c. Determine the barriers (supervision; availability and access to Infection Prevention Control material supplies) to infection prevention and control practice among healthcare workers in these hospitals; and

1.5 SIGNIFICANCE OF THE STUDY

We are devoted to preventing and controlling the transmission of healthcare associated infections to patients, clients, residents, healthcare workers, visitors and others. Preventing infections is a high priority, and ensure all measures are taken to reduce infections and prevent transmission. They are a important patient protection issue, and can also be Safety issue. A well-functioning Infection Prevention and Control program helps minimize these risks for our patients, residents, visitors and our staff. Infection-related diseases are still the main cause of morbidity and mortality in Sierra Leone (WHO, 2015).

Providing edification to patients and staff members, study of infections or epidemic, prevention of infections during activities such as monitoring hand hygiene or auditing practices, renovation of existing spaces and research is a paramount aspect. Significant microbiological evidence exists reflecting the increased risk of infection transmission specifically through inadequately Infection prevention and control guidelines. Significantly, it was recently discovered that widely-used high level Infection prevention and control guidelines increasingly apparent and attention must be paid to it. The guidelines and standards are comprehensive however the challenge is in general awareness and effective implementation into practice. The purpose of this paper is to present case studies that assess the perception of healthcare workers on IPC practices at two Hospitals in Bo and present strategies that address it.

II. REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION

IPC practices are a kin practice to public health and it is practiced within the confines of a particular health-care delivery system rather than at the public level as a whole. It tackles factors related to the spread of infections within the health-care setting and from staff to patient or among staff (WHO, 2002). An infection Prevention and Control practice is something we cannot do without if we want to ensure a healthy and safe health delivery services in our country. Infection Prevention and Control (IPC),

refers to policies and procedures used to reduce the risk of spreading infections, especially in humans and healthcare facilities.

An effective Infection Prevention and Control (IPC) program is necessary to excellence health care. This is because it has the possible benefits of reducing disease burden on patients, health institutions and the nation as a whole (MOH/GHS, 2009). Although infection is most prevalent in patients upon admission, healthcare workers also act as potential vectors for pathogenic agents. Hospitals provide a favorable transmission pathway for the spread of infections owing, partly, to poor infection control practices among health workers on one hand and overcrowding of patients in most clinical settings on the other (Bello et al., 2011)

2.2 PERCEPTION AND PRACTICE OF IPC

During the Ebola outbreak in Sierra Leone, one of the key issues was that from the first stage of infection, many people were not aware of the disease. Since it was the first time when Ebola outbreak happened in Sierra Leone. In addition, since people were not fully aware of it, infected patients was hiding from hospitals and following their own way of treating disease such as going to traditional healers or herbalist for medication (Quist-Arcton, 2014). Not only the behaviour of population avoiding hospitals, there was lack of healthcare facilities in Sierra Leone during the Ebola outbreak and nothing was prepared to fight against Ebola. Therefore, even for patient who willingly go to hospital find it difficult to seek medical help (Swartout, 2014) Furthermore, there was very limited insight and practice of IPC by Healthcare workers in health facilities in Sierra Leone. A study from South Africa demonstrated that HCWs in high HIV burden area were significantly more likely to be hospitalized with infectious diseases than were non-health care workers (O'Donnell et al., 2010).

2.3 HEALTHCARE WORKERS COMPLIANCE WITH IPC

WHO (2009) recommends particulate respirators for use by HCWs when caring for infectious or suspected in being infectious patients. For patients surgical masks are recommended to reduce spread of pathogens. Respiratory protection is acknowledged as a complementary level of protection for HCWs after other strategies have been implemented, and recommendations made to elaborate low-cost, non-disposable, of better appearance respirators allowing verbal communication with the patients (Nardell & Dharmadhikari, 2010). A comprehensive training program for HCWs on correct and routine use of particulate respirators was recommended by WHO (2009), however, some studies report that fit-testing program is neglected (Nardell & Dharmadhikari, 2010). Due to regular modification of lifestyles and environments, new diseases are constantly appearing that people are susceptible to, making protection from the threat of infectious disease urgent. Many new contagious, emerging and re-emerging diseases have been identified in recent past years such as AIDS, Ebola and Hantavirus (WHO, 2002). In Sierra Leone, a localized health emergency escalated into a major crisis due to a weak health system compounded by poor provision and access to basic public services. The crisis also highlighted the countries' infrastructural weaknesses, including inadequate provision of water, sanitation, electricity and education.

Infection control is an essential component of care and one which has too often been underestimated in modern years. It is an necessary but often under-recognized and under supported part of the infrastructure of healthcare. Infection prevention and control is a key component of practice for all healthcare professionals, not only for their health, but also to reduce infections, thus improving patient safety (MOH, 2005)

Infection control addresses factors related to the spread of infections within the healthcare setting whether patient to patient, patient to staff, staff to patient or among staff, including prevention (via hand hygiene, cleaning/disinfection/sterilization, vaccination, monitoring/investigation) of demonstrated suspected spread of infection within a particular healthcare environment. Research has demonstrated that up to one third of hospital acquired infection can be prevented with high intensity of Hospital Acquired Surveillance and Control Program (MOH, 2005).

Therefore a orderly move toward to detect deficiencies in infection control practices and to implement effective and affordable solution is urgently needed. Another factor that has been linked with compliance is incorporation of IP strategy in health care workers' curricular and in-service training on IP Protocol and Guidelines. According to Yamin *et al.*, (2012), health-care workers must show leadership in infection prevention and control by using their knowledge, expertise and immediately apply decisions to start appropriate measures for their protection.

2.4 BARRIERS TO IPC PRACTICE AMONG HEALTH WORKERS IN THE HOSPITAL

It may seem paradoxical that, the place where you go to be healed can make you ill. Hospitals are havens for infection-causing bugs, but by following a few practical tips, you can have a healthier hospital stay (Dove and Mann, 2006). The healthcare workers themselves can spread infection if they are not watchful about washing of their hands and changing gloves every time they move from patient to another. Hospital infection can also be the result of contaminated ventilation or water system.

Conversely, there are very many reservoirs, the one from which infections arise is usually called the source (WHO, 2002). Identification of the correct source is necessary to arrest the spread of the virus. The sources of spread can be classified along the same lines as the types of infection. For examples, the spread from community-acquired infection to other patients in the hospital can be through the respiratory tract as in tuberculosis and respiratory viruses, infected blood, as with viral hepatitis and HIV/AIDS. These infections arise from many different sources and are regularly associated with operative or other invasive procedures carried out in operating theatres, wards, x-ray departments and clinics. The groups at high risk of obtain infection due to diminished defenses require additional protection especially, in hospital areas where there are enhanced invasive procedures (WHO, 2002).

Infection is the invasion and increase of micro-organisms in the body tissues. The infection process is similar to a circular chain with each link representing one of the factors involved in the process. An infectious disease occurs if each link is present and in proper sequence. An additional mode of transfers, such as the air current, hands, vector fomites or other means by which the pathogens can move from one place or person to another. Open

wounds and reproductive tract are also means through which the pathogens can enter the body of susceptible host (MOH, 2005). According to (Burke, JP 2003) germs that cause infection spread through; Airborne (the germs are carried by the air such as the chicken pox virus), Droplet spread (infectious droplets of moisture are coughed or breathed out during infection). These settle on surface and may be conveyed to another person's eyes or mouth usually by their hands. Direct Contact (by touching someone that has the infection, such as scabies and Indirect Contact by contact with dirty equipment or other materials.

2.5 AVAILABILITY AND ACCESS TO MATERIALS FOR IPC AT HEALTH FACILITIES.

All health workers (e.g. nurses, physicians, housekeepers and cleaners) need to know why infection prevention is important. Knowledge of clinical infection control practices is continually growing and varying. While the principles of infection control (prevention, transmission and control) do not change, though specific clinical practices may evolve as a result of new evidence (MOH, 2009). Knowledge on disease transmission cycle, use of routes of infection and how to break the cycle, use of Standard Precaution when dealing with all patients and methods of minimizing disease transmission. Accessibility of Infection Prevention (IP) materials has been cited as important determinants of compliance with IPC practices. A study conducted revealed that inadequate supply of gloves in southern province-based health facilities led to the spread of infection among women during vaginal examinations (Mukwato *et al.*, 2003).

In another study behavior at the same hospital, it was reported that general hygienic actions taken to reduce the risk of HIV infection were insufficient and that many inadequacies stemmed from the lack of supplies (Mukwato *et al.*, 2003). Punctual access to resources for IP practices is crucial to effective and successful IPC practices in developing countries where infection rate is high (Mukwato *et al.*, 2003). Therefore, one way to increase IPC practices in hospitals must provide sufficient resources to support the program.

Successful program for preventing the spread of infectious diseases in healthcare facilities are based on understanding the scope of the trouble, prioritizing activities and successfully using accessible resources are habitually limited, careful planning, implementing and monitoring activities on a regular basis, whether in a small clinic or a busy district hospital are all essential (Tietjen *et al.*, 2003).

Managerial controls are among the most important steps in prevention and control of infections. Therefore administrative support and commitment is essential in the helpfulness of all other measures (Rak, 2010). Hospital authorities must understand that without the proper resources, hospitals can be high risk areas. Therefore healthcare authorities must establish and support a comprehensive, effective national objective and develop strategies, guidelines and policies for specific infection control issues which are regularly updated (Rak, 2010).

Implementing IPC program in low- and middle income countries is frequently hampered by financial constraints, inadequate logistics/materials, limited laboratory ability and insufficient staff training in areas such as hand hygiene, handling and disposal of clinical waste, handling and disposal of sharps,

decontamination and sterilization of used instruments and quality improvement.

The literature review suggests that infection includes non-clinical staff within a health-care setting. Therefore, the focal point should shift from “health-care workers” to “health workers” In wrapping up, the fact that healthcare workers may have numerous possible exposure makes it difficult to ascertain whether they acquired infections in the community or the workplace.

III. RESEARCH METHODOLOGY

3.1. INTRODUCTION

This chapter includes the research methodology that was applied to assess the perception of healthcare workers on infection prevention and control practices in two hospitals in Bo city. The research design, population, study area, and sampling procedures, data collection, data analysis methods and ethical considerations are also discussed. Its purpose is to provide a detailed explanation on the procedures to be used in carrying out the research.

3.2 RESEARCH DESIGN AND METHOD

The research was a descriptive cross-sectional study. A combination of qualitative and quantitative data collection methods was used. In-depth interviews were conducted to both patients and health providers at the two hospitals. The researcher and the interviewee agreed to sit in a private place and conduct the interview. The interview was conducted in Creole the language that was convenient for the interviewees. The survey employed self-administered questionnaire and observational show to collect data. One hundred and forty (140) respondents participated in the study. IPC performance was evaluated using interaction analysis of audio-taped clinical encounters. Patient perspectives were evaluated through exit interviews. Health provider perspectives about the relevance of IPC were evaluated through a self-administered questionnaire followed by a participatory discussion. Some variables were quantified and others explored in depth, thus generating descriptions.

3.3 DESCRIPTION OF STUDY AREAS

The study was conducted at Bo Government Hospital and UMC Mercy Hospital in Bo. The Bo Government Hospital is a referral centre in the southern Provinces while Mercy is a Faith Based Non-Governmental Organization, both providing general and particular services for the city and surrounding areas. Both hospitals have staff strength encompasses doctors, nurses, laboratory technicians, pharmacists and other health workers. The hospitals were chosen for the study because the researcher wanted to get a clear picture on the perception of healthcare workers on IPC practices at two Hospitals in Bo City and the compliance in IPC practices.

The place where this study is conducted is the second largest city in Sierra Leone in the Southern Province. The city serves as the capital and administrative centre of Bo District. It is a major urban centre, and lies approximately 155 miles south-east of Freetown. The city of Bo is one of Sierra Leone’s six municipalities and the municipality of Bo had a population of 149,957 in the 2004 census and a current estimate of 250, 266.

The city is home to a large population of many Sierra Leone’s ethnic groups, with no single ethnic group forming a

majority of the city’s population. The Krio language is most widely spoken in Bo and is used as the primary language of communication in the city. The city’s population is religiously diverse among Muslims and Christians. Bo lies on the main rail line east and south of Freetown which was closed in 1974. From 1930 until independence 1961, it was the capital of the Protectorate of Sierra Leone. After Freetown, Bo began its modern development with the coming of the rail road in 1889 and became an educational center in 1906, when the Bo Government Secondary School was established.

The inhabitants of Bo are known for their resolve, resistance and hospitality. The town was named after its generosity. An elephant was killed close to what is now known as Bo Parking Ground. People from the surrounding villages came to receive their share. Because the meat was so large, the hunter spent days distributing it and the words “Bo-lor” which in Mende language means translates to “this is Bo.”

3.4. POPULATION OF THE STUDY

Two hospitals, including Bo government hospital and Unite Methodist Church Mercy (UMC) Hospital were assessed on the perception of healthcare workers on IPC practices in Bo City between May–August 2018. These hospitals were selected because they are the major referral health centers and hospitals that offer many services. The study population consisted of 220 participants includes healthcare workers at these hospitals.

3.5 SAMPLE AND SAMPLING TECHNIQUES

This study used a descriptive cross-sectional research design. A sample of 220 participants includes healthcare workers were selected using simple random sampling technique. As a result of limited time within which the study was carried out and the shift system run by the hospital staff, expediency sampling method was employed to enable the investigator get a sensible sample size for the study. All data were collected by the key study. **Inclusion criteria:** All Health care workers working in the medical, surgical (female & male), children and maternity wards including theatre at the Hospitals in the selected hospitals for the last four months of commencement of the studies.

Exclusion criteria: People visiting the hospitals (patients and relatives) and other health care workers who do not work in the selected hospitals. Health care workers who work in these hospitals less than four months of beginning of the studies were not interrogated.

3.6 SAMPLE SIZE DETERMINATION

The sample size formula (Daniel, 1999) is used, which is

$$n = \frac{Z^2 P(1-P)}{d^2}$$

If your population more than

10.000

Where **n**: is the sample size where the sample size is more than 10,000, **Z**: statistic for a level of confidence. (For the level of confidence of 95%, which is conventional, Z value is 1.96). **P**: expected prevalence or proportion. (P is considered 0.5) and **d**: precision. (d is considered 0.05 to produce good precision and smaller error of estimate)

$$n = Z^2P(1-P) / d^2$$

P = 0.5, d = 0.05, Z = 1.96 (i.e., for a 95% C.I.) Therefore:

$$n = \frac{Z^2 P(1-P)}{d^2}$$

$$n = (1.96)^2 \times 0.5 (1-0.5) / (0.05)^2$$

$$n = 3.8416 \times 0.5 (0.5) / (0.0025)$$

$$n = 0.9604 / (0.0025)$$

$$n = 384.16$$

Thus, the study should include at least **384.16** subjects.

Adjusted sample for population less than 10,000, because the above sample is to be taken from a relatively small population where $N = 220$ ($N < 10,000$) the required minimum sample will be obtained from the above estimate by making some adjustment. Where n : is the sample size where the sample size is more than 10,000 and N is the population.

$$\text{Sample} = n \div \{1 + (n \div N)\}$$

$$\text{Sample} = 384.16 \div \{1 + (384.16 \div 220)\}$$

$$\text{Sample} = 384.16 \div \{1 + 1.74618182\}$$

$$\text{Sample} = 384.16 \div \{2.74618182\}$$

$$\text{Sample} = 139.888771$$

$$\text{Sample} = 140 \text{ subjects}$$

3.7 INSTRUMENTS FOR DATA COLLECTION AND PRESENTATION

In this study, the dependent attribute was compliance with IPC practices by the healthcare workers at the facility. The independent variables were the knowledge of IPC, availability and access to materials for IPC. Responses were coded and later presented using tables, figures and percentages. The study also used simple statistical like average mean, median to analyze the collected data. Data were also presented in a table to facilitate easy analysis and computation. Self-administered questionnaire used to collect data from the staff of the facilities were developed in English from specifically for this study and had four sections: **Section A:** Demographic data, **Section B:** comprised of health workers' perception/level of current Infection Prevention and Control (IPC) practice (Awareness of infection prevention and control and then the practice of sterile technique principles. Awareness of infection prevention and control was measured using scoring); **Section C:** compliance with the dictates of the Infection Prevention and Control Policy by health workers at these facilities; and **Section D:** the barriers (supervision; availability and access to Infection Prevention Control material supplies) to infection prevention and control practice among healthcare workers in these hospitals. The highest possible score was 20, those who attained below 10 had poor awareness, those who scored 10 to 14 had moderate awareness and those who attained 15 to 20 had outstanding awareness.

Observational guides were also used to assess the IPC practices amongst healthcare workers at the facilities using an observation checklist. Observations were made on the compliance with IPC practices by the healthcare workers at the health care facilities and the knowledge of IPC, availability and access to resources for IPC. (If these were available the answer, "Yes" was circled and if not available, "No" was circled.)

3.8 PROCESSING AND ANALYZING DATA

The data entered into Excel were exported and analyzed using Epi Data Analysis. Comparisons of the overall IPC

implementation before and after the interventions, disaggregated by facility ownership, were performed. The proportions of facilities with no, partial or full implementation for specific components and disaggregated by facility ownership, were compared.

3.9 ETHICAL CONSIDERATION/ISSUES

Ahead of the beginning of this investigation, a study proposal and etiquette was designed and submitted for approval. The consent of District Medical Superintendent at Bo Government Hospital and the Medical officer at United Methodist Church Mercy (UMC) Hospital Bo was granted. Before collecting the data a written letter of consent was administered to the potential respondents/study subjects for their approval to be enrolled in the study.

To be accuracy, self-administered questionnaire was edited and pretested before used to ensure consistency. Two (2) interviewers with adequate awareness in IPC practices, policy and protocol were recruited and trained on the use of standard checklists, data collection and field procedures. Study respondents filled an informed consent form before they were enrolled into the study. They had the options to withdraw at any time if they so desire and that they were not being compelled for taking part in the study.

3.10 LIMITATIONS TO STUDY

The study attempts to describe the compliance with these practices by the healthcare workers, availability and access to IPC resources at the facilities utilizing a combination of qualitative and quantitative approach. The key limitation was the incapacity to get the sample size. Due to operational reasons the sample was reduced from the planned to 140 respondents. The possibility that, the staff could alter their behaviour from their normal practices during ward observations was obvious. However, the findings of this research could be generalized in to the study population. Further, self-reported behavior which should be considered in future studies. The period of the study was short therefore the investigation did not include every study participants within the target area or population. Inadequate resources make it very complicated for the researcher to be able to access all the necessary respondents and data necessary for this study.

IV. DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 INTRODUCTION

The themes were chosen because it sought to address some of the issues pertaining to the objective of the study. Socio-demographic characteristics of the respondents; healthcare workers' perception/level of current Infection Prevention and Control practice (awareness of infection prevention and control and then the practice of sterile technique principles, awareness of infection prevention and control was measured using scoring); compliance with the dictates of the Infection Prevention and Control Policy by healthcare workers at these facilities; and the barriers (supervision; availability and access to Infection Prevention Control material supplies) to infection prevention and control practice among healthcare workers in these hospitals. The research findings showed fascinating and upsetting situations that

requires instant attention by Healthcare workers, policy makers and government.

4.2 DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

A total of 140 were included in the In this study as presented in Table 1 below. The female accounted for 58.57% (82) and were in the majority for both hospitals. The ages of participants varied from 14-24 years were 10.71% (15) and 25-35 years and 36-46 years were 32.14% (45) each. At the Bo government Hospital the age 36-46 years were in majority 36.73% (36) while at Mercy Hospital the age 25-35 years were in the majority 54.76% (23). 49.29% (69) of the respondents were married while 7.86% (11) were widowed. Majority, 88.1% had completed College/University program as their highest educational level for both hospitals. The largest professional 71.43% (100) group that participated in this study was nurses. The other staff formed the minority with 28.57% (40). Of the 71.43% (100) group that participated in this study that were nurses 12% (12) of the participants were charge nurses, 62% (62) were junior nurses and 26% (26) were senior nurses. About 72.86% (102) work between 15 years in their present positions of job and 27.14% (38) work less than 5 years in the health facility.

Table 1: Socio-Demographic Characteristics of Respondents (N=140)

Category	Characteristic	Bo Government Hospital (N=98)	Percentage (70%)	Mercy Hospital Bo (N=42)	Percentage (30%)	Total (N=140)	Total (%=100)
sex	Male	42	42.86	16	38.10	58	41.43
	Female	56	57.14	26	61.90	82	58.57
Total		98	100.00	42	100.00	140	100.00
Age	14 – 24 years	12	12.24	3	7.14	15	10.71
	25 – 35 years	22	22.45	23	54.76	45	32.14
	36 – 46 years	36	36.73	9	21.43	45	32.14
	47 – 57 years	28	28.57	7	16.67	35	25.00
Total		98	100.00	42	100.00	140	100.00
Marital	Singl e	33	33.67	7	16.67	40	28.57

statu s	Marri ed	37	37.76	32	76.19	69	49.29
	Wido wed	10	10.20	1	2.38	11	7.86
	Divor ced	18	18.37	2	4.76	20	14.29
Total		98	100.00	42	100.00	140	100.00
Educ ational Level	Belo w prima ry	8	8.16	3	7.14	11	7.86
	Prima ry	1	1.02	0	0.00	1	0.71
	Seco ndary	5	5.10	2	4.76	7	5.00
	Colle ge/Un iversit y	84	85.71	37	88.10	121	86.43
Total		98	100.00	42	100.00	140	100.00
Qual ific ation	Docto r	2	2.04	1	2.38	3	2.14
	Nurse	68	69.39	32	76.19	100	71.43
	Lab. Tech.	6	6.12	2	4.76	8	5.71
	other (speci fy)	22	22.45	7	16.67	29	20.71
Total		98	100.00	42	100.00	140	100.00

Source: Author’s Research Data, 2018.

4.3 HEALTH WORKERS’ PERCEPTION/LEVEL OF CURRENT IPC PRACTICE

The health workers’ perception of current IPC practice and sterile technique principles were observed. Knowledge of infection prevention and control were measured using scoring. Score out of 20 is showed in fig. 1; poor knowledge 21.4% (30) was below 10, moderate knowledge 50% (70) was between 10 and 14 and excellent knowledge 28.6% (40) was between 15 and 20.



Figure 1: Knowledge of IPC Practice by Respondents (N=140). Source: Author’s Research Data, 2018

Fig. 2 below shows that the 31.43% (44) of the respondents had never attended any IPC training workshop and 68.57% (96) had attended the workshop.

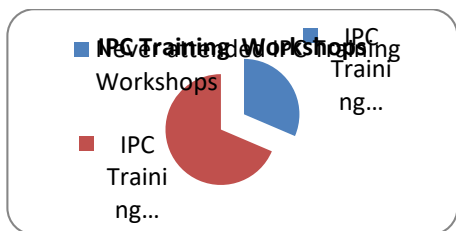


Figure 2: IPC Training Workshops attended by Respondents (N=140). Source: Author’s Research Data, 2018

Awareness of Infection Prevention Practices among Healthcare workers is presented in Table 2. It was noted that about 99% (139) of participants showed that they have heard about IPC and 68.57% (96) had training in IPC practices. When asked if training programs and awareness campaigns are helpful in preventing infection, 90% of the staff agreed to it. 28.57% (40) of the respondents said contact with blood and body fluids were the commonest mode of transmission while 71.42% (100) indicated needle pricks. Hand washing 40% (56) was a means of prevention while processing of instrument was 60% (84). The general level of awareness on IPC was as follows: the bulk of 60.71% (85) was well-informed with high knowledge; followed by 28.57% (40) who had some awareness and 10.71% (15) had low awareness.

4.4 COMPLIANCE WITH THE DICTATES OF IPC POLICY BY HEALTH WORKERS

Figure 3 below illustrate general level of compliance with IPC policies and procedure, 55% (77) had low compliance level with 45% (63) had high level of compliance.

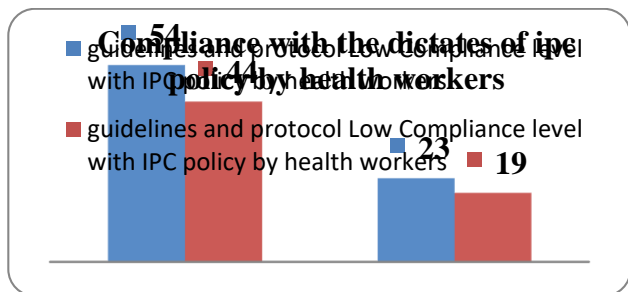


Figure: 3 Level of Compliances with the dictates of IPC policies by Respondents (N=140). Source: Author’s Research Data, 2018.

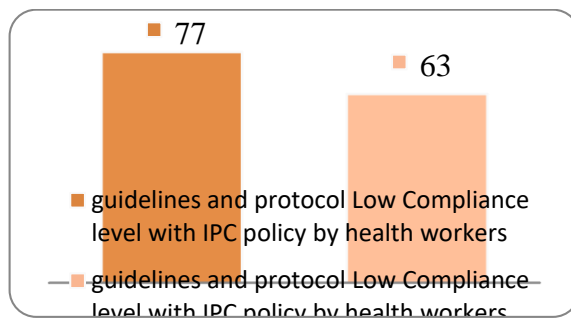


Figure: 4 Low Compliances Level with the dictates of IPC policies by Respondents (N=140). Source: Author’s Research Data, 2018.

On the existence of IPC focal persons or/and nurse, it was found that 95.71% (134) of respondents indicated that they were aware of the focal persons or nurse with only 4.29% (6) stated that there was no focal persons or/and nurse. It is worth noting that 100% (98) of the respondent at Bo Government Hospital were aware and that the 4.29% (6) respondent accounted for respondent at Mercy Hospital. When asked if there are any guidelines/protocols for IPC, 78% said yes, 8% said no and 14% did not know about it. 47% said they frequently follow these while 53% did it only occasionally. Access to IPC principles and procedures at the workplace, 22.14% (31) stated that they had no access to the guideline; with 77.86% (109) showed they had access to the policies. On the frequency of hand washing, 96.42% (135) stated they wash their hands, before and after contact with patients with only 3.58% (5) stated that they rarely washed their hands. Hand hygiene is first line of defense against hospital acquired infection as hands are the most popular vehicle of transmission of organisms. 98.57% (138) staff agreed that hand mediated transmission is the major source of cross infection, according to the questionnaire response 96.42% (135) of the staff said that they follow all five moments of hand hygiene as stated in WHO guidelines, although only 68.57% (96) of the staff actually followed it as per direct observation. 95.71% (134) of them feel hand washing should become an indispensable part of hygienic culture.

Bulk of the respondents indicated they have been using PPE while performing various procedures. The most common used PPE were gloves with 98.4% while the least used were boots with 0.9%. 94.28% (132) of questionnaire respondents believed that Personal Protective Equipment is an effective barrier for infection control but in actual practice only 85% (119) of staff used it. Responding through questionnaire 77.14% (108) of the staff said they always wear fresh gloves before patient examination while only 22.86% (32) said they do it sometimes. While in actual practice as per direct observation only 68.57% (96) of them wore fresh gloves before patient procedures.

57.85% (81) dispose used syringes and needles immediately into safety boxes with, 42.14% (59) put them into receivers before pouring them into sharp containers. Out of the 140 respondents 53.57% (75) said that they frequently dispose waste in a right colour coded dustbin, 44.28% (62) did it sometimes and only 2.14% (3) of the staff members rarely did it.

The staff had mixed views about the quality of sanitation services provided. Only 10% felt it was excellent, 43% thought it

was good, 31% said it's OK and 16% felt it was poor. 72% staff agreed that all the patient care equipments are sterilized properly, 28% did not agree with the above statement.

4.5 BARRIERS TO IPC PRACTICE AMONG HEALTH WORKERS

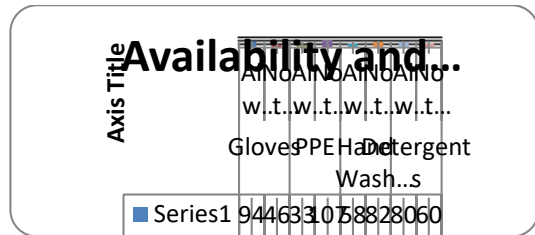


Figure 5: Availability and access to IPC material supplies (N=140). Source: Author's Research Data, 2018.

The ease of use and access to Infection Prevention Control material supplies were examined by supervision; 67.7% of the participants say gloves were available on the ward and 32.3% indicated gloves were not always available on the ward for practices. The availability of personal protective equipment, 76.6% of participants stated that PPE were not always available while (23.4%) stated PPE were available for IPC practices. With regards to hand washing items, (58.3%) indicated that the items were not always accessible and (41.7%) stated that the items were available. Majority, (57.4%) of the respondents indicated that, detergents were always available for decontamination, while (42.6%) stated that detergents were not accessible.

Table 2: Barriers to IPC Practice among Respondents (N=140)

Category	Characteristic	Bo Govern ment Hos pital (N= 98)	Perc enta ge (70 %)	Merc y Hosp ital Bo (N=4 2)	Pe rce nta ge (30 %)	Total (N=1 40)	Total (%=10 0)
Barri ers to IPC practi ce among health work ers	Lack of knowl edge	12	12.2 4	5	11. 90	17	12.14
	Time	36	36.7 3	22	52. 38	58	41.43
	Equip ment	18	18.3 7	4	9.5 2	22	15.71
	Forge tfulne ss	2	2.04	1	2.3 8	3	2.14
	Resou rces	30	30.6 1	10	23. 81	40	28.57
Total		98.0 0	100. 00	42.00	10 0.0 0	140.0 0	100.00

Source: Author's Research Data, 2018

The barriers to infection prevention and control practice amongst nurses, Table 2 shows that Lack of knowledge, time, equipment, Forgetfulness, resources are factors that impeded them from proper infection control practice, lack of knowledge indicated 12.14% (17), lack of time show 41.43% (58), lack of equipment indicated 15.71% (22), forgetfulness as a factor indicated 2.14 % (3) and lack of resources indicated 28.57% (40) as a factor impeding them.

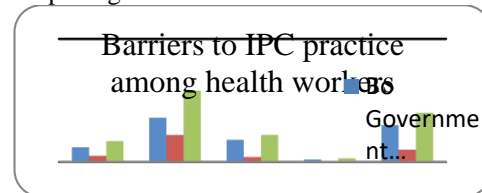


Figure 6: Barriers to IPC Practice among Respondents (N=140). Source: Author's Research Data, 2018.

4.6 DISCUSSION

4.6.1 Demographic Characteristics of the Respondents

140 respondents were incorporated in this study of which 58.57% (82) were female and were in the majority in both hospitals. At the Bo government Hospital the age 36-46 years were in majority which is 36.73% (36) while at Mercy Hospital the age 25-35 years were in the majority 54.76% (23). 49.29%. This shows that mercy hospital has more youth than Bo government hospital. Overall, 14-24 years were 10.71% (15) were in the minority while 25-35 years and 36-46 years were at par 32.14% (45) each which indicate that the average age is 36years. Majority, 88.1% had completed College/University program as their highest educational level for both hospitals which show that professional skills training. The largest professional 71.43% (100) group that participated in this study was nurses this shows that nurses make the greater percentage. The other staff formed the minority with 28.57% (40). Of the 71.43% (100) group that participated in this study that were nurses 12% (12) of the participants were charge nurses, 62% (62) were junior nurses and 26% (26) were senior nurses. About 72.86% (102) work between 15 years in their current positions and 27.14% (38) spent less than 5 years working at the facility.

4.6.2 Knowledge of IPC Practices among Health Workers

This study identified awareness about infection prevention practices among healthcare workers. Awareness of IPC and knowledge of its practices among the respondents were fair 50.0%. This proportion was relatively low compared with that obtained in a study by Mukwato et al, 2005 in which 63.6% of sampled healthcare workers had training in IPC. This difference in the result may be due to low access to training in IPC. Also, the study location might have influenced the disparity in the result of the two researches.

The majority of the participants are nurses (71.43%) and these are largely junior nurses (43%) and they are the ones with poor knowledge on infection prevention and control. This shows that the health workers' awareness of IPC principles is not enough which concurs with earlier studies by Had (2000) & Smith (2009). To aggravate the problem these junior health workers are the ones doing the nursing care and are not opportune to attend workshops.

A considerable number of nurses 31.43% (44) did not attend IPC training with the majority of these being junior health workers who are always providing day to day nursing care. A good number of those who control to attend IPC workshops and were expected to give react but these are not the case. This poses a great risk of infections as stated in a report by “WHO” (2001). For this reason, there is need for planned periodically training to equip the nurses with awareness on IPC. This is supported by Reid (2001) who recommended that nurses should get in- service training to gain knowledge on IPC

Yet, the maximum reference made to train IPC with the World Health Organization’s requirement was suggestive to a more theoretical approach to campaign about infection prevention practices (WHO, 2005). Although there were different levels of awareness on IPC among various ranks of the staff who have heard about IPC, it was inspiring as the highest score was 68.57%. Additionally, the knowledge of the staff on IPC did not prove any statistical association between training in IPC and knowledge in IPC.

4.6.3 Availability and Access to Material for IPC Practices

Non availability and access to materials for IPC practices is known to be one of the barriers to IPC practices (Mukwato et al, 2003). The most available materials for IPC practices on the ward were gloves 67.7%. Although gloves were mostly available on the wards, they are not easily accessible to work with. This disparity may be due to the fact that some ward sisters do not want to issue enough of the materials at a time for the staff to use with the excuse that the nurses are misusing the gloves. This was also observed during the ward observation as some wards were asking patients to provide gloves for to use when their ward in charges were not available.

The materials that were not available for IPC practices on the ward were hand washing stations, 58.3%. Although there were mostly available on some wards, they are not easily accessible to work with. This was due to the fact that water was hard to fetch. Other PPE were not available for IPC practices on the ward, 76.6% say so, although there were mostly available on some wards, maternity units and the theater.

Nonetheless, the most easily to get material was the detergent for decontamination 57.4%. There is difference between the accessibility of the detergents and their correct use. Most wards do not have the protocol for preparing the detergent pasted at where the decontaminants are placed and because of this most staffs were not conversant with the correct strength of the detergent they use on the ward. This situation can affect decontamination of used instruments which can be a cause of spreading of infection.

Additionally, majority of the respondents did not use the IPC manual, either because they did not know about it or it was unavailable. Hence, the IPC nurse should periodically teach the nurses in practice and make available manual in each ward. The nurses should be inducted on the use and importance of the manual. Other factors hindering IPC practices reported are: lack of resources and time which is consistent with what was reported in previous studies by Smith (2009), Dyer (2010), Swanson (2002) & Clark (2011).

4.6.4 Compliance with (IPC) Policies and Protocol

Compliance with IPC practices is base on the access to policies and protocol (Rak, 2010). Access to IPC polices by the health workers was as very low as 47%. This may explain the compliance with IPC practices among health workers. The highest complied practice was hand washing 68.57% (96). This result is contrary to that of (Tiejn, 2003) who mentioned a lower compliance among nurses in his study. Complying with the proper disposal of syringes and needles into safety boxes was 57.85% (81). This was lower than similar study carried out by Mukwato et al, 2005 where compliance with proper disposal of syringes and needles was 62.3% high. This was observed in one hospital where invented containers were used for needles and sharps.

The widely used PPE were gloves with 98.4% during various procedures. This is in agreement with what was obtained by (Tietjen, 2003.) This research seeks to assess the perception of healthcare workers on IPC practices in two hospitals in Bo City in relation to training, the accessibility and access to resources for IPC practices and compliance with regards IPC. The study revealed that compliance varied across different departments and for each hospital. Observable compliance was high at Mercy hospital and for the Bo government hospital in sectors such as Operating Theatre where supplies of materials for IPC were adequate compared to the Medical Ward where supplies were insufficient. About 89% of the participants observed in the Operating Theatre complied with IPC guidelines. However at the Medical and Surgical Wards respondents did not comply with IPC policies.

V. 5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The conclusion and suggestions of the research as related to the objectives. Also, it provides information relevant for strengthening IPC at the facility; assess awareness, availability and access to resources for IPC practices and compliance with IPC guidelines and protocol at the facility to ensure delivery of quality care to patients. They are presented as follows: demographic characteristics of the respondents, knowledge of infection prevention and control practices among health workers, availability and access to material for infection prevention and control practices, compliance with infection prevention and control guidelines and protocol.

5.2 CONCLUSIONS

The study showed low levels of awareness in IPC practices due to lack of information on IPC. It was also found that availability, access to materials for IPC practices and compliance with IPC guidelines were reasonable. Previous studies had shown that it is possible to determine nurses’ attitude. (Hu, Zhang et al., 2012), examined the knowledge, attitudes and self-reported behaviour and barriers to compliance with the use of personal protective equipment. The study involved health care workers (HCWs) at Bo government hospital and Mercy hospital Bo.

The study discovered that the bulk of junior nurses lack awareness of infection control principles. Factors impeding nurses from proper infection prevention and control practice which included lack of awareness, forgetfulness, lack of time and lack of resources were identified. Hence, it is needful for guidelines makers and administrators to provide both human and material

resources as well as provide timely and well planned in-service training to the nurses.

Both attitudes towards PPE use and perceived organizational norms have been recognized as predictors of compliance. Hand wash is the single most important intervention to prevent transmission of infection and should be a quality standard in all health institutions. An attitude of not washing hands among individuals involved in the provision of health care can increase the rate of hospital-acquired infections. In a study that was conducted in India, where (Nair et al., 2013) assessed knowledge, attitude and practices of hand washing among medical and nursing students at the health care centre, the majority of students had poor knowledge with regard to hand hygiene. Transmission of blood-borne viruses and other microbial pathogens to patients during routine health care procedures continues to occur due to unsafe and incorrect injection practice, Infusion and medication vial practices being used by health care professionals (Olalekan, et al., 2012).

The negative attitude towards infection prevention and control can promote transmission of infection from one point to another. According to Ward 2012:301306, nursing students generally observed a bad approach towards infection prevention and control from qualified staff, besides IPC was considered to be an added job load as different to a central feature of patient safety and excellent care. Surgical operations provide opportunities for the transmission of infection between patients and health-care workers (HCWs) and between patients. This risk may increase in underdeveloped and developing countries by low compliance with infection control policies and precautions (McGaw et al., 2012). The study concluded that HCWs had sub-optimal 55% (77) had low compliance levels with standard infection control guidelines and 45 % (63) of all participants had high level of compliance with all infection control policies. It is, therefore, important that all health workers strictly adhere to infection control guidelines, especially nurses because they spend more time with the patients. The study showed a raised in the number of subjects in each category scoring good and excellent in the post-education questionnaire.

5.3 RECOMMENDATION

The following actions are recommended for findings of this study:

5.3.1. This study is going to help in designing of the nursing training curriculum. It should include information on infection control so that they can gain in-depth knowledge on infection prevention and control guidelines. In-service education should be provided on infection control on regular basis as a measure to reinforce the knowledge of nurses on infection control. Training in IPC should be part of routine work process for all health facilities. This would improve the understanding of all staff in IPC practices which will lead to delivery of excellence care to patients.

5.3.2. The administration of the facility should ensure access to materials and their ease of use for workers to use for their work. There should also be policy at the facility for all care givers to comply with existing strategy and protocol. Policy makers must also provide enough information on IPC available to the health workers.

5.3.3. The IPC focal nurse should be vigorously functional and assume their monitoring and supervisory roles. The managers

should make sure policy manuals are made available to every nurse.

5.3.4 There is need for an development on the nurse patient ratio through staffing of more nurses thus deal with the reason of nurses lacking enough time to practice proper infection prevention and control principles. Resources such as disinfectants should be made available for the nurses to practice proper infection control.

5.3.5 The findings provide basis for other researchers who would want to carry out further investigations on infection prevention and control principles. It is expected that when the above suggestions are put in place, observance with IPC practices will improve to meet the standard recommended by WHO.

REFERENCES

- [1] Abbas, M. & Pittet, D. 2016. Surgical site infection prevention: a global priority. *Journal of Hospital Infection* 93(4):319-322. Available at: [www.journalofhospitalinfection.com/article/S0195-6701\(16\)30127-X/fulltext](http://www.journalofhospitalinfection.com/article/S0195-6701(16)30127-X/fulltext).
- [2] Aftab, H.B., Zahid, M.F., Zia, B., Reaheem, A. & Beg, M.A. 2015. Knowledge, Attitude, and Practices of healthcare personnel regarding the transmission of pathogens via Fomites at a tertiary care hospital in Karachi, 3(1):208.
- [3] Anderson, D.J., & Sexton, D.J. 2016. Antimicrobial prophylaxis for prevention of surgical site infection in Adults. Available at: <http://www.uptodate.com/contents/antimicrobial-prophylaxis-for-prevention-of-surgical-site-infection-in-adults>. [Date accessed: 20 June 2016]
- [4] Carrico, R.M. 2013. Guide to Preventing Clostridium difficile Infections. Association for professionals in Infection Control and Epidemiology, implementation guide:1-100.
- [5] CDC .2016. National and State Healthcare-Associated Infections Progress Report. Available at: <http://www.cdc.gov/HAI/pdfs/progress-report/hai-progress-report.pdf>. [Date accessed: 13 July 2016].
- [6] CDC 2016. Clean Hands Count for Safe HealthCare. Available at: <http://www.cdc.gov/Features/HandHygiene>. [Date accessed: 20 June 2016].
- [7] en.wikipedia.org/wiki/infection_control. (Accessed 13/12/2011).
- [8] Jain, M., Dogra, V., Mishra, B., Thakur, A., & Loomba, P.S. 2012. Infection control practices among doctors and nurses in a tertiary care hospital. *Ann Trop Med Pub Med public health*, 5(1):29-33.
- [9] Kalantarzadeh, M., Mohammadnejad, E., Ehsani & Tamizi, Z. 2014. Knowledge and Practice of Nurses about the Control and Prevention of Nosocomial Infections in Emergency Department. *Arch Clin Infect Dis*. 9(4).
- [10] MOPH & MOMS. (2010). National Infection Prevention and Control for Healthcare Services. Kenya.
- [11] PIDAC 2015. Infection Prevention and Control for Clinical Office Practice. Available at: [Http://www.publichealthontario.ca/en/eRepository/IPAC-Clinical-Office-Practice2013.pdf](http://www.publichealthontario.ca/en/eRepository/IPAC-Clinical-Office-Practice2013.pdf). [Date accessed: 20 July 2015].
- [12] Salama, R. 2015. Concept of Prevention and Control. Suez Canal University Egypt. Community medicine.
- [13] WHO Ban 2010-2011. National Guidelines On Hand Hygiene For Prevention Of Hospital-Acquired Infection (HAI).
- [14] WHO. 2001. Manual Infection prevention and control policies and guidelines. [Online]. Available at: https://www.spc.int/phs/PPHSN/Activities/PICNet/SECTIONS_1-6.pdf. Accessed: [24 February 2015].
- [15] WHO. 2009. WHO Guidelines on hand hygiene in health care.[Online]. Available at: http://whqlibdoc.who.int/publications/2009/9789241597906_eng.pdf. [Accessed: 24 February 2015].
- [16] WHO. 2010. The Burden of Health Care-Associated Infection World Wide. Available at: <http://www.who.int/gpsc/country-work/summary-20100430-en.pdf>. [Accessed: November 2016].
- [17] WHO. 2011. Preventing Bloodstream infections from central line venous catheters.

- [18] WHO. 2015. Infection prevention and control in healthcare. [Online]. Available at: http://www.who.int/csr/bioriskreduction/infection_control/en/. [Accessed: 24 March 2015].
- [19] Yamin, Jain, A., Mandelia, C. & Jayaram, S. 2012. Perception and practice regarding infection control measures amongst healthcare workers in district government hospitals of Mangalore, India. *Int J Health Allied*. 1(2):68-73

AUTHORS

First Author – Prince T. Lamin-Boima- Milton Margai College
Of Education And Technology