

**EBOLA VIRUS DISEASE RISK PERCEPTION AND COMPLIANCE
WITH INFECTIOUS DISEASE CONTROL PRACTICES AMONG
MORTUARY WORKERS IN SOME SELECTED SOUTH WESTERN
STATES IN NIGERIA**

BY

ADAMU HELEN NGODOO

MATRIC NUMBER: 172730

DVM (UNIMAID)

**A DISSERTATION SUBMITTED TO THE DEPARTMENT OF
EPIDEMIOLOGY AND MEDICAL STATISTICS, FACULTY OF PUBLIC
HEALTH, COLLEGE OF MEDICINE, UNIVERSITY OF IBADAN, IN
PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD
OF THE DEGREE OF MASTER OF PUBLIC HEALTH (M.P.H), IN FIELD
EPIDEMIOLOGY**

OF THE

UNIVERSITY OF IBADAN

MARCH, 2015

DEDICATION

This project work is dedicated to God Almighty, my creator and provider who has led me this far.

To my parents for their unrelenting support and prayers. Mom you are my support. To my dad for giving me the best gift-education.

UNIVERSITY OF IBADAN LIBRARY

ACKNOWLEDGMENTS

I am immensely grateful to everyone who have contributed to the success of this work.

I appreciate my supervisors, Dr M.D. Dairo, and Dr J.O. Akinyemi for your patience and guidance in the successful completion of this project. I couldn't have asked for better supervisors. Thank you for being easily accessible and for critically reviewing my work.

I also appreciate the immense contribution of Dr Adedokun, and Dr Adeoye your invaluable contribution and patience with me, even though you were swamped in work. May God bless you and your families.

I appreciate my parents for their support and my siblings Mkusu, Doose, Msonter, Sewuese, Daniel, Ruby for their love and concern. I pray that God will grant you all your heart desires.

My appreciation goes to a special friend Samuel Ogundare for being just you. A rare gem.

I appreciate my inestimable friends who made this program worthwhile Excellence Uzochukwu, Dolapo Akadri, and Omone Ogbiti. May God take you to the height of your destinies.

This will not be complete without appreciating my course mates, Femi, Kemi, Banke, Bimbo, Kere, Hogan, Tolu, Daniel, Gbolade. May God guide you all in your endeavours, Amen.

ABSTRACT

Ebola is a viral disease associated with high mortality. Since the disease was first reported in 1976, it has affected parts of Africa especially Sub-Saharan Africa. The most recent outbreak in West Africa is the largest on record and has rapidly spread to other countries including Nigeria.

Risk perception is an essential characteristic determining adoption of preventive practices. Mortuary workers and embalmers represent a high risk group for the transmission of Ebola virus disease. However risk perception adoption that may determine behavioral preventive among this group is not documented in Nigeria.

This cross-sectional study used a random sampling technique to select from Ibadan and Lagos metropolis mortuary attendants and embalmers. A pretested interviewer administered questionnaire which included 12 point knowledge scale on EVD, 7 point scale on attitude to EVD cases, 16 point scale on adherence and 14 point scale on perception was used to collect information from respondent. Knowledge score of ≥ 6 , attitude score of ≥ 4 , adherence score of ≥ 8 , were classified as good respectively. Perception score ≥ 7 was classified as high. Data were analysed using descriptive statistics, Chi-square and logistic regression tests at 0.05 level of significance.

Mean age was 45.61 ± 11.2 years, 86% were Yoruba, 89.7% were males, 64.5% and 35.5% were mortuary attendants and embalmers respectively. Forty-four percent had the highest proportion with secondary level of education. All (100%) the respondents were aware of Ebola Viral Disease (EVD). Respondents' source of information includes media (59.8%), health facility (33.6%), and friends and relatives (4.7%). Majority (75.5%) had good knowledge of EVD. Respondents in Lagos metropolis were more likely to know about EVD than those in Ibadan metropolis. (OR = 4.02, 95%CI = 1.00-16.18). About (24.3%) opined that washing EVD corpse cannot transmit EVD while minority (3.7%) opined that EVD can be embalmed. Respondents' risk perception on EVD was high (86.9%). Respondents with more than 15 years' work experience were less likely to have a high EVD risk perception. (OR = 0.13, 95%CI = 0.02-0.71). Level of compliance was high (98.1%). Attitude to EVD survivors was poor (59.8%).

Respondents with university education were more likely to have good attitude (OR= 10.76, 95%CI = 1.73-66.72). Also respondents in private health facility were less likely to have good attitude than those working in public health facility. (OR = 0.12, 95%CI = 0.03-0.52).

Although EVD knowledge, risk perception and the level of compliance among mortuary attendants and embalmers was high, respondents still showed high risky behavioral practice towards the disease. Thus, there is need for sustained media campaigns and training of this vulnerable group to bridge gaps in knowledge of Ebola Virus disease. The study reinforces the need for training on standard precautions which is insufficient in itself without supplying PPE material to health facilities for implementation of infectious disease control practices.

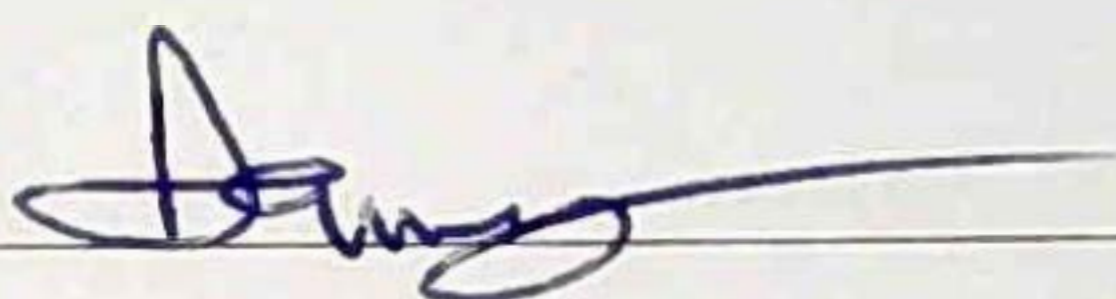
KEY WORDS: Ebola viral disease, risk perception, attitude, and compliance

WORD COUNT: 464

UNIVERSITY OF IBADAN LIBRARY

CERTIFICATION

This is to certify that this research work was carried out by Helen Ngodoo ADAMU in the Department of Epidemiology and Medical Statistics, Faculty of Public Health, College of Medicine, University of Ibadan.

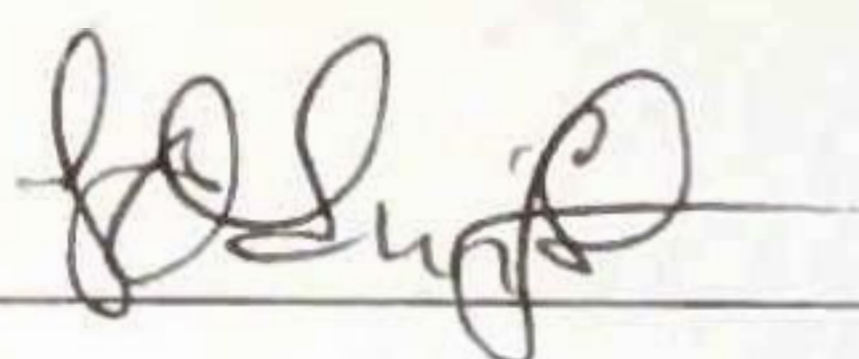


SUPERVISOR

Dr M. D. DAIRO

MBBS, M.Sc. Epid. & Med. Stat. (Ib), MWACP, FMCPH (Nig)

Department of Epidemiology & Medical Statistics,
Faculty of Public Health, College of Medicine,
University of Ibadan
Ibadan, Nigeria.



CO-SUPERVISOR

Dr J. O. AKINYEMI

B.Tech. (Akure), M.Sc. Medical Statistics, PhD (Ib)

Department of Epidemiology & Medical Statistics,
Faculty of Public Health, College of Medicine,
University of Ibadan
Ibadan, Nigeria.

TABLE OF CONTENTS

Title page.....	i
Dedication.....	ii
Acknowledgement.....	iii
Abstract.....	v
Certification.....	vii
Table of contents.....	viii
List of Tables.....	xi
List of Figures.....	xiii
List of Acronyms used in the text.....	xiv
Operational Definition of Terms.....	xv

CHAPTER ONE: INTRODUCTION

1.1	Background of the Study	1
1.2	Problem statement	3
1.3	Justification for the Study	3
1.4	Research questions	3
1.5	Broad Objective	4
1.6	Specific Objectives	4
1.7	Research Hypotheses	4

CHAPTER TWO: LITERATURE REVIEW

2.1	Historical background	5
2.2	Virion structure of Ebola Viral Disease	6
2.3	Prevalence of Ebola Viral Disease	6
2.4	The reservoir of Ebola Viral Disease	7
2.5	The distribution of Ebola Viral Disease	7
2.6	Pathogenesis of Ebola Viral Disease	8
2.7	Transmission of Ebola Viral Disease	9
2.8	Clinical features of Ebola Viral Disease	10

2.9	Complications of Ebola Viral Disease	10
2.10	Diagnosis of Ebola Viral Disease	10
2.11	Treatment of Ebola Viral Disease	11
2.12	Determinants/Risk factors of Ebola Viral Disease	11
2.13	Control of Ebola Viral Disease	13
2.14	Prevention of Ebola Viral Disease	13
2.15	General strategy in Ebola Viral Disease	14
2.15.1	Pre-Epidemic Phase	14
2.15.2	Alert	15
2.15.3	During Epidemic Phase	15
2.15.4	Post Epidemic Phase	16
2.16	Duties of Mortuary attendants	16
2.17	Methods of Viral haemorrhagic fever control practices	16
2.18	Infection Control Practices	17
2.19	Assessment of compliance to infectious disease control practices	18

CHAPTER THREE: METHODOLOGY

3.1	Study Design	19
3.2	Study area	19
3.3	Study site	20
3.4	Study Population	20
3.5	Inclusion Criteria	21
3.6	Exclusion Criteria	21
3.7	Sample Size Determination	21
3.8	Sampling Technique	22
3.9	Data collection instruments	23
3.10	Validity of the instrument	23
3.11	Data Collection technique	24
3.12	Data Management and Analysis	24
3.12.1	Data analysis	24
3.12.2	Data management	25

3.13	Study variables	26
3.14	Ethical Considerations	26
3.14.1	Informed consent	26
3.14.2	Confidentiality of data	26
3.14.3	Beneficence to participants	26
3.14.4	Non maleficence to participants	26
3.14.5	Voluntariness	26

CHAPTER FOUR: RESULTS

4.1	Survey results	27
4.2	Socio-demographic characteristics of respondents	27
4.2.1	Age and sex distribution	27
4.2.2	Occupation and Age distribution	27
4.2.3	Distribution of respondents by age, ethnicity and type of facility	27
4.3	Awareness and sources of information on Ebola Viral Disease	30
4.4	Risk assessment	31
4.4.1	Occupational duties	31
4.5	Knowledge of respondents on Ebola Viral Disease	32
4.6	Factors associated with knowledge of Ebola Viral Disease	36
4.7	Attitude to Ebola viral disease related cases	38
4.8	Factors associated with attitude towards Ebola Viral Disease	42
4.9	Attitude to PPE use	44
4.10	Compliance with infectious disease control practices	48
4.11	Respondents' risk perception on Ebola Viral disease	52
4.12	Multivariate analysis of factors associated with EVD risk perception	58
4.13	Respondents' area of residence	60
4.14	Qualitative analysis	64
4.14.1	Focus Group Discussion (FGD)	64
4.14.2	Participants	64
4.14.3	Knowledge on Ebola Viral Disease(EVD)	65
4.14.4	Risk perception regarding EVD	65

4.14.5	Attitude to EVD cases	65
4.14.6	Attitude to PPE use	66
4.14.7	Behavioral risks predisposing to infection	66
4.14.8	Adherence to infectious disease control practices	66

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1	knowledge on Ebola Virus Disease among respondents	68
5.2	Risk perception on Ebola Virus Disease among respondents	69
5.3	Attitude on Ebola Viral Disease cases among respondents	70
5.4	Attitude to PPE use among respondents	71
5.5	Adherence to Infectious Disease Control Practices	71
5.6	Behavioral Risks of respondents	72
5.7	Summary of Findings and their implication	73
5.8	Limitations of the study	73
5.9	Conclusion	74
6.0	Recommendation	74

REFERENCES	75
-------------------	----

APPENDICES

1	Informed consent	83
2	Questionnaire	84
3	Focus group discussion	89
4	Iwe Ibeere	93
5	Atona si Ajogbimoropo	99
6	Letter of Ethical approval	103

4.14.5	Attitude to EVD cases	65
4.14.6	Attitude to PPE use	66
4.14.7	Behavioral risks predisposing to infection	66
4.14.8	Adherence to infectious disease control practices	66

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1	knowledge on Ebola Virus Disease among respondents	68
5.2	Risk perception on Ebola Virus Disease among respondents	69
5.3	Attitude on Ebola Viral Disease cases among respondents	70
5.4	Attitude to PPE use among respondents	71
5.5	Adherence to Infectious Disease Control Practices	71
5.6	Behavioral Risks of respondents	72
5.7	Summary of Findings and their implication	73
5.8	Limitations of the study	73
5.9	Conclusion	74
6.0	Recommendation	74

REFERENCES	75
-------------------	----

APPENDICES

1	Informed consent	83
2	Questionnaire	84
3	Focus group discussion	89
4	Iwe Ibeere	93
5	Atona si Ajogbimoropo	99
6	Letter of Ethical approval	103

4.14.5	Attitude to EVD cases	65
4.14.6	Attitude to PPE use	66
4.14.7	Behavioral risks predisposing to infection	66
4.14.8	Adherence to infectious disease control practices	66

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1	knowledge on Ebola Virus Disease among respondents	68
5.2	Risk perception on Ebola Virus Disease among respondents	69
5.3	Attitude on Ebola Viral Disease cases among respondents	70
5.4	Attitude to PPE use among respondents	71
5.5	Adherence to Infectious Disease Control Practices	71
5.6	Behavioral Risks of respondents	72
5.7	Summary of Findings and their implication	73
5.8	Limitations of the study	73
5.9	Conclusion	74
6.0	Recommendation	74

REFERENCES	75
-------------------	----

APPENDICES

1	Informed consent	83
2	Questionnaire	84
3	Focus group discussion	89
4	Iwe Ibeere	93
5	Atona si Ajogbimoropo	99
6	Letter of Ethical approval	103

LIST OF TABLE

Table 3.6.1	Ibadan metropolis: Proportional allocation according to size per LGA
Table 3.6.2	Lagos metropolis: Proportional allocation according to size
Table 4.1	Age group and sex distribution of respondents
Table 4.2	Age group and occupational distribution of respondents
Table 4.3	Other socio-demographic characteristics of respondents “ N=107”
Table 4.4	Respondents’ response on Knowledge of Ebola Virus Disease (N= 107)
Table 4.5	Respondents’ knowledge of Ebola Viral Disease according to socio demographic characteristics
Table 4.6	Multivariate logistic regression of knowledge on Ebola Viral Disease
Table 4.7	Respondents’ attitude to EVD cases
Table 4.8	Respondents’ attitude to EVD cases by socio-demographic characteristics
Table 4.9	Multivariate logistic regression of attitude towards EVD cases
Table 4.10	Respondents’ PPE use
Table 4.11	Respondents’ PPE use by socio-demographic characteristics
Table 4.12	Compliance with Infectious Disease Control Practices by Respondents
Table 4.13	Respondents’ level of compliance of infectious disease control practices by socio demographic characteristics
Table 4.14	Mean scores for Infectious disease control practices by occupation
Table 4.15	Risk perception of respondents on Ebola Viral Disease
Table 4.16	Reported perceived risk by respondents’ area of residence
Table 4.17	Respondents’ risk perception by socio-demographic characteristics
Table 4.18	Multivariate logistic regression for respondents’ characteristics and risk perception on Ebola Viral disease
Table 4.19	Respondents’ Socio-demographic characteristics by area of respondents

- Table 4.20 The distribution of respondents knowledge and attitude score by perceived risk group
- Table 4.21 Facility-wise socio-demographic variables of the participants

UNIVERSITY OF IBADAN LIBRARY

LIST OF FIGURES

Figure 4.1 Sources of information on Ebola Viral Disease

Figure 4.2 Distribution of respondents' occupational duties

UNIVERSITY OF IBADAN LIBRARY

LIST OF ACRONYMS

EVD	Ebola Viral Disease
EBOV	Ebola Zaire
BDBV	Ebola-Bundibugyo
SUDV	Ebola-Sudan
TAFV	Tai Forest ebolavirus
RESTV	Ebola virus Reston
GP	Glycoprotein
WHO	World Health Organization
CDC	Centre for Disease control and Prevention
FMOH	Federal Ministry of Health
NCDC	Nigerian Centre for Disease Control
IDCP	Infectious Disease Control practices
PPE	Personnel Protective Equipment
SP	Standard practice

OPERATIONAL DEFINITION OF TERMS

- PPE** Personal protective equipment (PPE) such as gloves, apron, rubber boots, face shield, eye google, nose mask, etc worn to protect against contracting contagious diseases.
- Risk perception** This refers to the view of the respondents regarding Ebola viral disease and covers their worry of contracting EVD, and their opinion about the disease status.

UNIVERSITY OF IBADAN LIBRARY

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Ebola Viral Disease (EVD) is a non-segmented, negative stranded RNA virus of the family flaviviridae. (Feldmann and Geisbert, 2011). There are five species of the virus and Ebola Zaire is the most pathogenic with a high case fatality rate of up to 90%. (WHO, 2014; FMOH, 2014). The disease was first recorded in 1976 to have occurred in two simultaneous outbreaks in Southern Sudan and subsequently in northern Zaire now known as Democratic Republic of the Congo (DRC). (Pourrut et al, 2005; Feldmann and Geisbert, 2011). EVD was not identified for next 15 years after which the disease reemerged in 1994-1997 with the first human case to be recorded in June 1994 whereby a Swiss ethnologist contracted the disease after performing autopsy on a chimpanzee found dead in Tai National Park located in Ivory Coast. (Pourrut et al, 2005; Peters and Leduc, 1999). Multiple outbreaks have since then been recorded over the years between 2000 and 2004. (Pourrut et al, 2005).

In May 2014, WHO reported on the mass transmission of EVD in Sierra Leone as a result of risky burial practice in which over 365 Ebola deaths could be linked to a certain funeral ceremony. Mourners came by the hundreds from nearby town to honor a famous traditional healer who died of the EVD disease and participated in traditional funeral and burial ceremony. Traditional burial practices can be linked to 60% of all cases in Guinea. (WHO, 2014). Ebola Viral Disease is currently ravaging parts of West Africa. It is the largest outbreak on record with a death toll of 3338 and 7178 cases as at 1st October 2014. (WHO, 2014). Countries particularly affected include Guinea, Sierra Leone and Liberia. Nigeria experienced an outbreak of EVD in the month of July, with a total of 898 contacts that were linked to the index case, a Liberian who imported the deadly disease into the country in late July, 2014. The Liberian who was being treated subsequently infected the staff of the health facility while tests were being run to diagnose his condition. (Fasina et al, 2014).

The symptoms and signs of the disease are almost indistinguishable from other causes of fever in endemic localities such as malaria, typhoid, yellow fever and other viral diseases. (WHO, 2014). The disease is spread in the population by human to human transmission with infection resulting

from direct contact with the blood, secretions, organs or other body fluids of infected individuals and also indirectly through contact with materials such as bed linen, clothes with infected fluid, etc (CDC, 2014; WHO, 2014). Ebola Viral Disease can also be transmitted when persons have direct contact with infected deceased individuals. (WHO, 2014). Bausch et al, 2007 reports that EVD can be found in the skin of infected persons and other body fluids such as sweat, saliva, nasal blood, stool, breast milk, semen, tears etc. Prevention includes wearing protective clothing, washing hands when around a person with the disease, and proper disposal of the dead through cremation or burial. (WHO, 2014; CDC, 2014). The Vulnerable populations such as the health workers, hunters, mortuary attendants, embalmers are constantly in contact with deceased persons, this exposes them to threat of viral hemorrhagic infection because their duties includes and not limited to touching and washing deceased bodies, changing soiled linen and assisting pathologists in autopsy procedures. (WHO, 2014; CDC, 2014)

The potential for widespread infections in countries with medical systems capable of making accurate diagnosis is low. (CDC, 2014). However some health facilities report deaths without a diagnostic report. To diagnose EVD, other disease with similar symptoms such as Malaria, cholera and other viral hemorrhagic fevers have to be excluded. WHO recommends that blood samples are to be tested for viral antibodies, viral RNA, or the virus itself. Unfortunately most communities in developing countries cannot afford the high cost of medical care and result to self-medication or using traditional medicine. Infected individual who are symptomatic are usually too weak to go to healthcare facility without assistance. (WHO, 2014).

CDC recommends that postmortem should not be conducted on a deceased body that died of EVD. This is because when an EVD patient dies, the bodies and body fluids remains contagious for several days after death. Hence the risk of transmission is still high. Therefore before disposal of deceased body, mortuary attendants should be fully kitted with personnel protective equipment such as face shield, double surgical gloves, aprons, shoe covers. Dead bodies should be placed in a leak-proof plastic bag not less than 150um thick and zippered and placed in another leak proof bag. Washing, cleaning and embalming of bodies that died of EVD should be avoided. (CDC, 2014).

Currently there are no vaccines or antiviral drugs approved for Ebola Viral disease although there are several adenoviruses derived vaccines, vesicular stomatitis Indiana virus, or filovirus-

like particles derived vaccines, and DNA vaccines undergoing clinical trial. EVD has no treatment and can only be treated symptomatically. (WHO,2014).

1.2 Problem statement

Ebola Viral Disease (EVD) has similar symptoms with endemic fevers such as Malaria, cholera and other viral hemorrhagic diseases. The Ebola Epidemic ongoing in West Africa still places Nigeria at risk due to the non-restriction of international travelers from endemic countries, inadequate surveillance activities and the inability of the community members to seek prompt medical treatment for persistent fevers and diagnosis of disease, poor certificate for dead bodies being transferred across borders or to funeral homes. Mortuary attendants and embalmers therefore are constantly at risk of contracting EVD due to the nature of their profession. Conducting autopsy in determining cause of death can be hazardous both to the mortician and the mortuary attendant and subsequently the embalmers. The resultant implication is that Mortuary attendants and embalmers are sometimes exposed to corpse without knowing the cause of death if at all they are prudent enough to take precautions when handling all deceased bodies with unknown causes of death and caution when handling deceased bodies diagnosed with other infectious diseases issued by a competent medical personnel.

1.3 Justification

There is dearth of data on the knowledge, perception and practice on Ebola Viral disease among mortuary attendants and embalmers in Nigeria and Africa. Therefore this study will be conducted in Oyo and Lagos states to ascertain the knowledge and practice regarding EVD of this vulnerable group and their adherence to infectious disease control practices. The knowledge garnered from this study will be a useful baseline data in evaluating efforts in behavioral change communication and in improving on the health education of this vulnerable group

1.4 Research Questions

1. What is the level of knowledge on EVD among mortuary attendants and embalmers?
2. What is the risk perception of EVD among mortuary attendants and embalmers regarding EVD?

like particles derived vaccines, and DNA vaccines undergoing clinical trial. EVD has no treatment and can only be treated symptomatically. (WHO,2014).

1.2 Problem statement

Ebola Viral Disease (EVD) has similar symptoms with endemic fevers such as Malaria, cholera and other viral hemorrhagic diseases. The Ebola Epidemic ongoing in West Africa still places Nigeria at risk due to the non-restriction of international travelers from endemic countries, inadequate surveillance activities and the inability of the community members to seek prompt medical treatment for persistent fevers and diagnosis of disease, poor certificate for dead bodies being transferred across borders or to funeral homes. Mortuary attendants and embalmers therefore are constantly at risk of contracting EVD due to the nature of their profession. Conducting autopsy in determining cause of death can be hazardous both to the mortician and the mortuary attendant and subsequently the embalmers. The resultant implication is that Mortuary attendants and embalmers are sometimes exposed to corpse without knowing the cause of death if at all they are prudent enough to take precautions when handling all deceased bodies with unknown causes of death and caution when handling deceased bodies diagnosed with other infectious diseases issued by a competent medical personnel.

1.3 Justification

There is dearth of data on the knowledge, perception and practice on Ebola Viral disease among mortuary attendants and embalmers in Nigeria and Africa. Therefore this study will be conducted in Oyo and Lagos states to ascertain the knowledge and practice regarding EVD of this vulnerable group and their adherence to infectious disease control practices. The knowledge garnered from this study will be a useful baseline data in evaluating efforts in behavioral change communication and in improving on the health education of this vulnerable group

1.4 Research Questions

1. What is the level of knowledge on EVD among mortuary attendants and embalmers?
2. What is the risk perception of EVD among mortuary attendants and embalmers regarding EVD?

3. What are the behavioral risks that predisposes to EVD infection among mortuary attendants and embalmers?
4. What are the EVD preventive practices of Mortuary attendants and embalmers in prevention of EVD?
5. Do they adhere to infectious disease control practices?
6. What is the level of adherence to infectious disease control practices?

1.5 Broad Objective

The study is aimed at assessing Ebola Viral Disease risk perception and compliance with infectious disease control practices among mortuary attendants and embalmers in some south western states in Nigeria

1.6 Specific objectives

1. To assess the level of knowledge on EVD among mortuary attendants and embalmers
2. To assess the risk perception of mortuary attendants and embalmers on EVD
3. To determine the attitude of mortuary attendants and embalmers on EVD
4. To determine the attitude of mortuary attendants and embalmers to PPE use
5. To identify behavioral risks that can predispose mortuary attendants and embalmers to EVD infection.
6. To assess the EVD preventive practices of mortuary attendants and embalmers.
7. To determine the level of adherence to infectious disease control practices among mortuary attendants and embalmers.

1.7 Research hypothesis

There is an association between EVD risk perception and compliance with infectious disease control practices.

CHAPTER TWO

LITERATURE REVIEW

2.1 Historical Background

Ebola virus is a Pleomorphic, negative stranded RNA viruses. Formerly known as Ebola hemorrhagic fever. It causes one of the most virulent pathogens currently known to infect humans. (WHO, 2014; Leroy, 2011). The epidemiology and epizootiology of EVD remains unclear. (Evans, 1989). EVD has five identified subtypes of Ebola virus. Four out of the five causes diseases in humans and these are the Ebola Zaire (EBOV) from the Republic of Congo in Gabon, Ebola-Sudan (SUDV), Ebola-Bundibugyo(BDBV), Ebola Cote d'Ivoire (CDC, 2014), Tai Forest Ebolavirus (TAFV) (WHO, 2014;Feldmann et al, 2011) and Ebola virus Reston (RESTV) isolated from Asian cynomolgus monkeys and pathogenic in non- human primates. These subtypes were isolated from infected individuals and are highly lethal both to Humans and non- human primates.(Leroy, 2004; Lucas et al, 2003). BDBV, EBOV and SUDV are associated with large outbreaks in Africa while RESTV and TAFV are not. The RESTV are found in the Peoples Republic of China and the Philippines.(WHO, 2014). The disease was first reported in Sudan and Zaire in 1976 by two distinct viral species. (Mahanty and Bray, 2004). Outbreak investigation revealed the disease to have first occurred with travelers who acquired the disease in an undetermined manner after which the secondary spread was by person to person. The one in Zaire occurred in a village near the Ebola River from where the name of the disease was derived and the other occurred in a remote area of Sudan.(WHO, 2014). In 1994, the disease reappeared in Gabon. It was a hospital based epidemic. In 2000, the reemergence of Sudan Ebolavirus in Ugandan recorded a total of 425 cases and 224 deaths.(Lamunu et al, 2002). Ever since the identity of the disease in 1976, there have been 885,343 suspected and laboratory confirmed cases of EVD. (Leroy, 2011).The disease has been ravaging parts of Africa and is a growing concern in Sub-Saharan Africa. The most recent outbreak is the 2014 West African outbreak and is the largest on record which begun in Guinea and rapidly spread to other neighboring countries such as Sierra Leone and Liberia. As at 14th October 2014, 9216 suspected cases resulting in 4,555 deaths have been reported. (WHO, 2014).

2.2 The Virion structure of Ebola Viral Disease

Ebola and Marburg virus are the only members of the filoviridae family of viruses characterized by long filamentous form. The Ebola virus has a 65- 90 nm by 130-2600 nm form and may have different shapes which can be brush like spikes protruding from an outer virionic membrane, or like a fish hook, or some other bizarre shapes. (Sanchez et al, 1999;Mandell, 1979). Other shapes can be twisted rods, and bulbous extensions from ends of particles. The Virus has an RNA with essential lipids on the surface of the membranes. It has a molecular weight of $3-6 \times 10^8$ with a sedimentation coefficient of 13.000-14.000.(Mwanatambwa et al, 2001). They also have an internal helical core that is assumed to be nucleocapsid. Morphogenesis occurs in the cytoplasm of infected cells while virus maturation and release occurs by budding through the host cell plasma membrane. (Feldmann et al, 2011; Evans, 1989). The Ebola virus structural gene is arranged linearly and starts from 3' end to 5' end region with 7 bases in between. The 4th protein gene starting from the 3' end encodes 2 glycoproteins which is a virion surface glycoprotein (GP) and a secretory glycoprotein (SGP).(Mwanatambwa et al, 2001).

EVD has single glycoprotein (GP) gene containing both N and O linked glycans which forms the attachment structure called peplomer on the surface of the virions. These GP genes is encoded in 2 frames (0 and -1 frames) which link by transcriptional editing. The result of which is a smaller, non-structural secreted soluble GP(SGP) as the predominant gene and is produced in large quantities in cell cultures. The SGP and GP terminals share approximately 300 N-terminals residues having a unique C- terminal. (Feldmann et al, 2011; Sanchez et al, 1999).

2.3 Prevalence of Ebola Viral Disease

The virulence of EVD is mainly dependent on the strain or species. Infections with the Zaire Ebola virus have the highest case fatality rates of 60-90% followed by the Sudan Ebola virus species with a case fatality rate of 40-60%. Bundigyo strain due to the single outbreak, is estimated with a case fatality rate of 25%. (Feldmann and Geisbert, 2011). Today EVD has spread to other countries, such as Liberia, Senegal, Nigeria, Sudan, and Gabon due to the ongoing West African Outbreak.

WHO weekly Epidemiological report of August 31, 2014 recorded Guinea with Case fatality rate of 64% out of a total of 771 suspected and confirmed cases, Liberia with a CFR rate of 51%

out of a total of 1698 suspected and confirmed cases, Sierra Leone with a CFR of 39% out of 1216 suspected cases. Nigeria with a 33.3% CFR out of a total of 21 suspected and confirmed cases. Senegal with only 1 suspected case and no fatality recorded.(CDC, 2014; WHO, 2014).

The Case Fatality Rate of EVD has been recorded at 50-70% with an attack rate estimated at 1-8 cases/ 1000 persons exposed with a higher rate of infection among hospital personnel.(Mandell, 1979). The disease causes up to 90% mortality in the most severe forms (Leroy, 2011).

2.4 The Reservoir of Ebola Viral Disease

The natural reservoir of Ebola remains unidentified. (FMOH, 2014; Lucas et al, 2003). Although the Fruit bats of the genera *Hypsignathusmonstrosus*, *Epomopsfranqueti* and *Myonycteristorquata* are considered possible natural hosts of the Ebola virus.(WHO Fact sheet, 2014; Leroy et al,2005). However there is strong believe in the research community that the virus is zoonotic, out of which the four subtypes occurring in an animal native host.(Mbonye et al, 2012).Bats are frequently found in Equatorial Africa and is hunted for food. EVD might be asymptomatic or subclinical in reservoir species with little or no transmission unless activated through an appropriate stimulus which might be stress, pregnancy, change in source of food, or co-infection, this hypothesis has been demonstrated in-vivo, and in vitro. This accounts for the sporadic nature and periodicity of EVD in Africa. (Feldmann and Geisbert, 2011).

2.5 The Distribution of Ebola viral Disease

According to Mupere et al,2012.Ebola has the unique epidemiological feature of relatively sparing the pediatric population. School age children age six to fifteen (37.5%) and sixteen to twenty-one (41.6%) were more likely to survive EVD than Under-fives (76.9%). This is because the immune system under-fives takes time to develop compared to their school aged counterparts. This is highlighted in a study conducted in Northern Ugandan-Gulu district, wherein a retrospective descriptive survey of hospital records for hospitalized children and adolescents under 18 years showed that under-fives had a higher case fatality rate than the older children because they had closer prolonged contact with infected ward/parents. The study concluded that only (9%) 20 out of the 218 laboratory confirmed cases were children and adolescents. (McElory, 2014; Mupere et al, 2012)

Furthermore children who did not survive EVD were more likely to suffer from endothelial dysfunction and can be treated with different classes of drugs called Statins which reduced the cholesterol level and have the beneficial side effect of strengthening the cells of blood vessels. (McElory, 2014).

Several reports also depicted that females were more at risk of being infected with Ebola virus than the males, this is because females play the role of caregivers to an infected family members than the males hence increased exposure to the causative agent through contact with the sick and their body fluids such as stools, vomits and blood. Culture also plays a strong role in this that females are expected to cater for infected family member and not necessarily the male. (Mupere et al, 2012; Mbonye et al, 2012).

2.6 Pathogenesis of Ebola Viral Disease

Conducting clinical studies during outbreak conditions is usually difficult therefore most of the data on the pathogenesis of Ebola viral disease has been gotten from laboratory experiments conducted on mice, guinea pigs or the non-human primates. (Mahanty and Bray, 2004). The Ebola virus invades the body through the mucus membranes, such as break in the skin or parentally. (Feldmann and Geisbert, 2011). Cell types such as Monocytes, macrophages, dendritic cells, endothelial cells, fibroblasts, hepatocytes, adrenal cortical cells and epithelial cells are affected. (Peter, 2005). The virus destroys these variety of cells in many different tissues by first binding to widely distributed cell surface lectins, and secondly causing infections of these cells resulting in necrosis because of the toxic effect of the viral envelope glycoproteins and other matrix proteins. (Mahanty and Bray, 2004). The spleen, thymus, lymph nodes of patients fatally infected with EVD experience lymphoid depletion and necrosis. (Feldmann and Geisbert, 2011). The lymph nodes are the primary sites of EVD infection and shows little inflammatory cellular response. In essence, the systematic dissemination of this virus from its entry point leads to suppression of innate immune response. (Yang et al, 2000). Therefore, the virus impairs the development of antigen-specific immune responses by preventing the activation of T-cells by the dendritic cells. Finally Macrophages produce a wide range of mediators that trigger severe hemorrhagic fever including the release of cytokines and chemokines that induce vascular dysfunction, low blood pressure and multiple organ failure. (Mahanty et al, 2004; Peters and

Leduc, 1999). Reports indicate that inflammatory cytokines levels are higher in fatal cases than in infected survivors.(Yang et al, 2000)

2.7 Transmission of Ebola Viral Disease

Since the reservoir of EVD is unknown, researchers has hypothesized that the first patient became infected through contact with an infected animal.(CDC, 2010). After which transmission then occurred through the blood or secretions of the infected individual. (Evans, 1989). This is postulated as the major mode of transmission.

Other routes of infection could be exposure to infected animals such as apes and bats whether dead or alive, by handling or consuming infected bush meat or entering fields close to fruit trees where infected bats live. (WHO,2014). Handling and consumption of freshly killed bats was associated with the EVD outbreak that occurred in DRC and butchering of chimpanzee linked to the outbreak in Gabon. (Feldmann and Geisbert, 2011).

Transmission can also occur through contact with objects that have been in contact with infected secretions such as medical materials, eating utensils, linens of infected patients if handled immediately or contact with blood, vomit, stool or urine of the patient or via droplets from an infected patient who has symptoms of cough or is vomiting.

In health care facilities, nosocomial infections can occur when health care workers treat infected individuals without use of protective clothing. (CDC, 2014;WHO, 2014). Air borne transmission is not significant. EVD can also be transmitted through sexual activity of a known or suspected male, this is because the virus is still present in semen up to 3 months after clinical recovery.(WHO,2014; Bausch et al, 2007).

Community members can be exposed when individuals such as family members, care takers, traditional healers, mortuary attendants, embalmers and those participating in burial rituals expose themselves to infected individuals.(WHO, 2014). The recognized high risk groups are the health workers, mortuary attendants and embalmers.For example when caregivers care for infected persons or contact with close families.(WHO, 2014).

2.8 Clinical Features of Ebola Viral Disease

The incubation period of EVD ranges from 2-21 days.(WHO, 2014). Initial symptoms of the disease includes anorexia, myalgia, headache, malaise, sore throat, fever followed by nausea, vomiting, diarrhea, pharyngitis, and cough and stomach pain.(WHO, 2014; CDC, 2010). Vesicular rash appears 5 days after with encephalitis, evidence of hepatitis and disseminated intravascular coagulation. (WHO, 2014; Mandell, 1979). Bleeding is a definitive sign of Ebola and suggest a poor prognosis. Death usually occurs 6-9 weeks after the onset of symptoms. (Ustun, 2004). The prominent symptom of EVD is chest pain and respiratory symptoms such as dyspnea and cough. Viraemia is still present in infected individuals until death and also in an interval of 1 week after during acute illness. (Evans, 1989). The most predictive symptom of EVD is abdominal pain which is often accompanied with diarrhea. (Fomenty et al, 1995).

Breast feeding mothers that are infected with the Ebola disease are at high risk of transmitting it to their nursing infants even during the convalescent period.(Bausch et al, 2007). EVD is more severe in pregnant women probably due to the development of complications such as bleeding unrelated to the EVD, and placenta previa. Spontaneous abortion is frequent in pregnant women due to several factors such as pyrexia, intravascular coagulopathy, Ebola virus disease infection in fetus. (Mupapa et al,1999). In later stages, shock, convulsions, severe metabolic disorders whereby most cases diffuse coagulopathy occurs. (Feldmann and Geisbert, 2011).

2.9 Complications of Ebola Viral Disease

The complications of Ebola Viral disease include Loss of memory, Central nervous system disorder, and loss of hair during the convalescent phase of the disease. Loss of weight is also a constant feature because of anorexia and asthenia.(Fomenty et al, 1995) pregnancy, and late sequel. (Peters et al, 1999).

2.10 Diagnosis of Ebola Viral Disease

EVD should be considered in the differential diagnosis of febrile illness in places where viral hemorrhagic illness occurs. Differentials diagnosis includes malaria, trypanosomiasis, yellow fever, Lassa fever, dengue, relapsing fever, rickettsiosis, meningitis, hepatitis e.t.c.(WHO, 2014; Evans, 1989). The most important aid in making a diagnosis of EVD by a medical personnel in

an endemic region is eliciting a history of exposure within day 2-21 before the onset of symptoms.(WHO,2014).

Ebola can be isolated from infected tissues, from blood injected intraperitoneally in guinea pigs or from vero cell tissue cultures. The virus can be identified in blood clots or tissue secretions using their morphological characteristics under the electron microscope and by the indirect immunofluorescence. Other methods such as complement fixation technique, neutralizing and immunofluorescent antibodies can be used to diagnose and distinguish Ebola from the morphologically similar Marburg. (WHO, 2014; Mandell, 1979) This is because people who survive acute infection develop low titered complement fixation (CF) antibodies including antibodies detectable by indirect immunofluorescent. (Evans, 1989). Samples from infected patients are extremely bio-hazardous and should be conducted under maximum biological containment facilities. (WHO, 2014).

2.11 Treatment of Ebola Viral Disease

There is no treatment for Ebola Viral disease. Patients that are severally ill require intensive supportive therapy such as electrolytes and intravenous fluids because they are frequently dehydrated. (WHO, 2014). Adequate symptomatic treatment of EVD patients reduces the case fatality rate significantly. Human convalescent blood or serum has been used for passive immunity to treat infected patients. (Feldmann and Geisbert, 2011). Studies suggesting the effect of Transfusions such as convalescent serum in providing coagulation factors to stop or prevent bleeding is not conclusive. (Mupapa et al,1999).

2.12 Determinants/ Risk factors of Ebola Viral disease

Risk assessment in disease-endemic area like Nigeria is difficult because the natural reservoir of the virus and mode of transmission to humans is unknown. (CDC, 2014). However, the exposure that is strongly predictive of risk for secondary transmission is direct contact with an ill family member such as vomit, blood, stool or sharing a hospital bed, either at the early phase of the disease at home or during the convalescent period.(Dowell et al, 1999). High titers of Ebola Virus has been recovered in Sweat, urine and saliva.(Bausch et al, 2007;Dowell et al, 1999).Exposure to urine appears to have a low risk of transmission during the acute and

convalescent period of the disease. (Bausch et al,2009). Studies proving small particle aerosol transmission are not conclusive.

A study conducted in Kikwit, DRC Congo found children susceptible to Ebola viral disease infection or severe disease. (Dowell et al, 1999). This is because children are in constant contact with the caretakers who may be elders or their parents. Females are also at higher risk of contracting the disease than males due to the role of women as care takers in the society.

Evidence of sexual transmission of Ebola from individuals that recovered from Ebola exists. (WHO, 2014). Since women have little control over abstinence or protected sex, this source of transmission poses additional risk in contracting the disease. Pregnant women infected with Ebola have a high rate of miscarriage and high neonatal mortality (100%).

A study conducted by CDC, showed that persons having direct contact with sick individuals were more likely to be infected. Others routes are, touching the body of a deceased person. However sleeping on the same mat with a sick person and acquiring the disease is weak association and can be confounded by other variables so also is the risk of sharing meals. Moreover, washing clothes of a sick person, and participating in the ritual of hand washing during funeral rites, were not significant risk factors. A study conducted in Uganda showed that contacts with patients body fluid was the strongest risk factor, however transmission through fomites is also possible. (Francesconi et al, 2003).

Cultural factors such as risky burial rites are shown to be responsible for 60% of EVD cases in Guinea. Practices such as washing and touching dead bodies exposes the community to EVD infection since deceased bodies are still infective after death. (WHO, 2014)

Traditional treatment methods involving treatment by traditional healers in Guinea shows that risky practices whereby the skin is cut with unsterilized blade and blood poured on the open cut has been linked to the reoccurrence of EVD in the country. (Kunii, 2001).

Behavioral practices involving eating and cooking bush meat like chimpanzee and bats have been linked to outbreaks recorded in Gabon, and Sierra Leone. (WHO, 2014: Kunii, 2001)

2.13 Control of Ebola Viral Disease

Disease surveillance is a critical component of health systems providing essential information to ensure optimum healthcare delivery and cost effective health strategy. It is essential for priority setting, planning, resource mobilization and allocation. Prediction and early detection of epidemics and monitoring and evaluation of disease prevention and control programs. (Martinez, 2002).

In the event of an outbreak or during the pre- epidemic phase, community surveillance should be conducted by the community or community based volunteers who are to identify alert cases and report to the surveillance team or the nearest health facility. An alert case is defined as an individual with persistent fever unresponsive to treatment with at least one of the following signs such as bleeding, bloody diarrhea, bleeding into urine, or any sudden death or fever plus contact with a case patient or fever plus at least 3 of 10 symptoms. (WHO, 2014; Tambo et al, 2014). While a confirmed case is defined as a suspected case with laboratory confirmation and is positive with the IgM antibody, or through a positive PCR, or viral isolation test. (WHO, 2014)

The spread of EVD is contained using strict isolation procedures. Laboratory personnel who have contact with blood or other specimens should use meticulous isolation techniques to avoid contamination and should be conducted in biosafety level 4 contamination facility. (WHO, 2014).

2.14 Prevention of Ebola Viral Disease

There are currently no licensed vaccines. (WHO, 2014). Although several are being tested, among the replication- deficient platforms, the human adenovirus type 5 have shown success in non-human primate model, although it is weakened by preexisting immunity. Live attenuated Ebola virus vaccine vectors have also been developed. Issues such as vaccine safety is difficult and does not seem feasible for this vaccine type. (Feldmann and Geisbert, 2011). Other are DNA vaccines or vaccines derived from Vesicular stomatitis Indiana virus or filovirus like particles.(Geisbert et al, 2008; Warfield et al, 2007).

Community members who are care givers to patients suspected of EVD must use strict barrier nursing procedures in order to reduce risk of infection since they are the ones most at risk. (CDC,

2014). The touching or consumption of infected bush meat should be avoided, and unsafe burial practices should be prevented. Community members should avoid contact with materials such as clothing and linens that have been contaminated by the fluids of infected patient.(WHO, 2014).

The community members should build a separate latrine to be used only by the patient. Used and soiled bleach should be poured into the Latrine used by the infected individual. In transferring corpse, community members should use bleach- soaked towels. The room should be cleaned with bleach and all objects and materials should be burned or buried especially the mattress used by the infected community member. Community members should endeavor to wash their hands with soap and clean water before eating and the water should not be used twice.(WHO, 2014).

Behaviors that predispose community member to Ebola Viral disease are varied. WHO, recommends that community member wash hands frequently, wash fruits before consumption. Avoid handling or consumption of dead bush animals. Avoid consumption of Bats and cook foods thoroughly. Also risky burial practices should be avoided. (WHO, 2014).

EVD is sensitive to irradiation, chemicals such as Phenol. Bleach should be used at 2.5% solution. (Mix 1 part concentrated bleach and 5 parts water). Bleach is ineffective after 24 hours. The virus can survive in liquid or dried material for a number of days. It can be inactivated by UV radiation, gamma irradiation, and can also be complete inactivated by heat with temperature as high as 60°C for an hour but stable at -70 °c. (ECDC, 2014). Ebola virus is susceptible to 5% Peracetic acid and 1% formalin. EVD can be inactivated by 0.3% betapropiolactone for 30 minutes at 37°C.

2.15 General strategy in Ebola Viral Disease Control

During previous outbreaks, successful implementation of measures in the preparedness, prevention and control have been divided into four phases and these are the Pre-epidemic preparedness, Alert, outbreak response and containment operations and finally the post epidemic evaluations. (WHO, 2014).

2.15.1 Pre - Epidemic phase

It is recommended that the public health service set up surveillance system in identifying viral hemorrhagic fevers in conjunction with animal mortality surveillance as an early warning

system. This is because animal outbreaks of Ebola usually occur before human outbreak but is often undetected. Hospitals should also step up standard infection control practices in reducing the spread of pathogen from known or unknown sources and dissemination of standard case definitions, awareness of healthcare workers in VHF surveillance.

This phase also involves informing the public on risk behaviors that can predispose to infection with Ebola viral disease such as hand washing, washing fruits before eating etc. Other activities include identifying and conducting sensitization programs for vulnerable individuals like the hunters, traditional healers, healthcare workers, mortuary attendants and embalmers etc. Stock up Personal protective equipment and other supplies needed at Federal, State, and Local levels. Update the list of cold chain facilities, waste management system, telecommunications network in the local health care area.

2.15.2 Alert

In the event of a suspected case of Ebola. The response team investigate immediately, confirm or discard any rumors. The response team includes epidemiologist, a clinician, laboratory specialist, a logistics coordinator, and other necessary experts such as infection control expert, anthropologist, Veterinarian. etc The Local health authorities should be notified of the disease outbreak and support requested. During the investigation, information should be collected from community members, local authorities, health care personnel etc. Analyze the data, describe the route of transmission and identify the population at risk. WHO should be notified of the disease with regular update. Collection and transportation of specimen should be conducted in accordance with recommended guidelines. Active case finding and follow-up of contacts should be conducted.

2.15.3 During Epidemic phase

In the event of a confirmed case of Ebola, there must be a multi-sectoral outbreak control strategy. The surveillance of contacts for a period of 21 days after the last known exposure and subsequent referral to the isolation ward should they fall ill. The public should be informed of the practice that can reduce community transmission. The clinical management of Ebola infected individuals by establishing an isolation ward implementation of barrier nursing precaution, and safe burial practices and strengthening infection control practices in the affected region.

2.15.4 Post Epidemic phase

In this phase, resume surveillance activities and extend solidarity and compassion to the affected community. Declare the end of the outbreak. Conduct an evaluation of outbreak management and end-of-epidemic report. Records of the outbreak should be kept and can serve as reference documents for other countries.

2.16 Duties of Mortuary attendants

The duties of a Mortuary attendants/assistants includes but not limited to the following;

Prepares body for postmortem examination and pathological study by cleaning and washing using necessary solutions, Assists pathologist in autopsy procedures, performs housekeeping duties such as sterilizing autopsy equipment, disposing of potentially bio-hazardous material, cleaning the autopsy table and area after procedure, prepares body for release to mortician after PM examination by sewing up cavities and aspirating fluids. Delivers soiled linens to laundry, returns clean linen to morgue and storage room. In view of the risk contracting infection due to the nature of their occupation, WHO recommends the use of personal protective equipment (PPE) to minimize the risk of occupational related infection.

2.17 Methods of viral Hemorrhagic Fever Control Practices

As a rule of thumb among health personnel, strict precautions like wearing protective clothing, such as masks, gloves, gowns, goggles, and other forms of infection control measures, proper disposal of infected corpse is paramount needing proactive attention by health authorities in order to checkmate incidence of nosocomial transmissions through person to person contact, body fluids, and excreta.

Safe work practices should be encouraged and include isolating VHF patient in a single patient room with a closed door and private bathrooms, limiting the number of health care workers to only essential personnel and monitoring the patient at all times. Perform regular cleaning and disinfection of surfaces.

Biological materials that might have been contaminated should be handled carefully and disposed properly by burning. All instruments used on the patient, if not disposable, must be

subjected to autoclaving immediately. However absolute care should be taken when collecting pathological materials for laboratory investigations. (Fisher-Hoch et al, 2000).

Deceased bodies and surrounding areas should be sprayed with 1:10 solution of bleach. The bodies when placed in bags(Mortuary sacks) should be closed securely and spayed with 1:10 bleach solution (WHO, 2014).

2.18 Infection control practices

Barrier nursing concept involves the need to provide for the protection of the clinical personnel and to prevent the escape of highly contagious disease into the environment while at the same time not neglecting the treatment of the patient. This is used to describe the care and treatment of patients suffering from highly contagious, life threatening diseases. These include Marburg, Ebola, Lassa, Crimean-Congo fever, and pneumonic plague.

The appropriate use of the Personal Protective Equipment (PPE) is essential. Personnel entering the patients' room should wear disposable gloves, gowns, masks and shoe covers. Protective eye wear should be worn when dealing with disoriented or uncooperative patients or in performing procedures such as nasogastric tube insertion or an intravenous or arterial line as this can involve patients' blood or vomit. Protective clothing must be worn and removed in the anteroom. Only essential hospital personnel are to be allowed into the room. Isolation signs should be placed outside the anteroom listing necessary precautions. (WHO, 2014; CDC, 2014).

The patient should be isolated in a single room with an adjoining room serving as its only entrance. The anteroom should contain supplies for routine patient care such as gloves, gowns, masks for the staff, hand-washing facilities and decontaminating solutions. If possible the patients' room should be at negative pressure and the air should not be recirculated. (WHO, 2014)

Patients are to use a chemical toilet. Secretions, excretions, and other body fluids should be treated with disinfectant solutions. All materials used for patients such as disposable linen and pajamas should be double bagged in airtight bags. The outside bag should be sponged with disinfectant and incinerated or autoclaved. This should also follow for disposable items worn by

staff and in patient care such as suction catheters and dressings. Suitable disinfectants includes 0.5% sodium hypochlorite, phenolic disinfectants (0.5-3) % or freshly prepared solutions of gluteraldehyde (2%).

Factors affecting barrier nursing are availability of gloves, cost of gloves if clients are to buy, availability of hand washing facility, and attitude of health care worker to procedure. Laboratory tests should be carried out in high containment facilities, specimen handling should be kept to a minimum and performed only by experienced technicians using all available precautions such as gloves and biosafety cabinets. (WHO, 2014; CDC, 2014)

2.19 Assessment of compliance to infectious disease control practice

Assessment of adherence should be conducted with the aid of checklist by directly observing healthcare workers when they are performing their duties. Health care workers should be assessed in relation with patient care and personnel observation. These include

Hand hygiene performance: Health care workers should be assessed if they wash their hands before and after patient contact even if gloves are worn. HCW should endeavor to wash hands after contact with body fluids and contaminated surfaces.

PPE use: PPE should be removed before leaving patients room, and hands washed after removing PPE. Also Gloves and gowns should be used for each patient and not reused. Gloves and gowns should be used if contact with body fluids or contaminated equipment. Facial protection such as surgical mask, eye goggles, and face shield should be worn during procedures that are likely to generate splashes.

Injection safety: Needles and syringes should be used per patient. Medication vial should be disinfected with alcohol prior to piercing. Medication vials should be used within 28 days and discarded. All sharps are kept in a puncture resistant sharps container

Environmental cleaning: Surfaces that are frequently touched especially those close to the patients should be cleaned with disinfectants according to the manufactures instruction.

staff and in patient care such as suction catheters and dressings. Suitable disinfectants includes 0.5% sodium hypochlorite, phenolic disinfectants (0.5-3) % or freshly prepared solutions of gluteraldehyde (2%).

Factors affecting barrier nursing are availability of gloves, cost of gloves if clients are to buy, availability of hand washing facility, and attitude of health care worker to procedure. Laboratory tests should be carried out in high containment facilities, specimen handling should be kept to a minimum and performed only by experienced technicians using all available precautions such as gloves and biosafety cabinets. (WHO, 2014; CDC, 2014)

2.19 Assessment of compliance to infectious disease control practice

Assessment of adherence should be conducted with the aid of checklist by directly observing healthcare workers when they are performing their duties. Health care workers should be assessed in relation with patient care and personnel observation. These include

Hand hygiene performance: Health care workers should be assessed if they wash their hands before and after patient contact even if gloves are worn. HCW should endeavor to wash hands after contact with body fluids and contaminated surfaces.

PPE use: PPE should be removed before leaving patients room, and hands washed after removing PPE. Also Gloves and gowns should be used for each patient and not reused. Gloves and gowns should be used if contact with body fluids or contaminated equipment. Facial protection such as surgical mask, eye goggles, and face shield should be worn during procedures that are likely to generate splashes.

Injection safety: Needles and syringes should be used per patient. Medication vial should be disinfected with alcohol prior to piercing. Medication vials should be used within 28 days and discarded. All sharps are kept in a puncture resistant sharps container

Environmental cleaning: Surfaces that are frequently touched especially those close to the patients should be cleaned with disinfectants according to the manufactures instruction.

CHAPTER THREE

STUDY METHODOLOGY

3.1 Study design

This is a descriptive cross sectional study that was conducted among mortuary attendants and embalmers in public, private healthcare facilities and private funeral homes in Ibadan and Lagos metropolis.

3.2 Study area

Ibadan is located in the south west geopolitical zone of Nigeria. It is the capital of Oyo state. Oyo state consist of 33 Local Government areas. The state covers a total of 27,249 sq km of land and it is bounded in the south by Ogun state, in the North by Kwara state, in the West it is partly bounded by Ogun state and partly by the republic of Benin, while in the East by Osun state. According to the 2006 population census Oyo state has a population of 5, 591,589 about 2,809,840 male and 2, 781,749 female. The inhabitant of Ibadan are predominantly Yoruba's, the others ethnic minorities includes Igbo, Urhobos, Edo, Efiks and Hausas. There are eleven (11) local government areas in Ibadan which are classified into Urban and Semi urban local Government areas i.e five (5) urban and (6) semi urban. Majority of the population works in the private sector and are mainly traders, university and polytechnic lecturers, students, artisans while a good number of the workers are civil servants. (SMOH, 2012).

Ibadan metropolis where the study was conducted has 5 urban local government with their headquarters within the city. The public healthcare delivery system is structured into three levels, namely the primary, secondary and tertiary health care. Ibadan metropolis has one public tertiary healthcare facility(University college hospital), two public secondary healthcare facility(Adeoyo maternity hospital, at Yemetu and Ring road) and 52 primary healthcare facilities distributed in LGA within the city and several private health care facilities.

University College Hospital has 17 Mortuary attendants, Adeoyo Maternity Hospital, Yemetu has 3 mortuary attendants, Adeoyo State Hospital Ring road has 7 mortuary attendants. The private hospitals are Oluyoro private Health facility and Eleta Private Health facility. The private

funeral homes in Ibadan metropolis has a total of 45 embalmers. Therefore a total figure of 72 mortuary attendants was used for the study.

Lagos state is located in the south-western part of Nigeria. It is bounded in the North and East by Ogun state, in the West by the Republic of Benin and in the South by the Atlantic Ocean. It was created on 27th of May, 1967. Lagos state covers an area of 3, 577 sq.km. and has a population of 17.5 million and a growth rate of 3.2%. (National Population Commission, 2006). It is the leading commercial center of Nigeria. Lagos state has 20 local governments and 37 LCDA's, out of which 16 is urban and 4 is rural. (Lagos state government, 2014) Out of these local governments, two of them host communities are historical in forming the center of Lagos city. (Abegunde et al, 2009).

Lagos metropolis is made up of 16 LGA's and contains 88% of the population of Lagos. Lagos Island, the central local government Area and historic center of metropolitan Lagos has a population of 212,700 at the 2006 census. The indigenes of Lagos Metropolis are Yoruba's but is now home to a lot of ethnic minorities such as the Igbos, Urhobos, Edos, Efiks and Hausas.

Lagos metropolis where the study was conducted has 16 local government. It has 1 public tertiary healthcare facility (Muchin LGA), 23 public secondary healthcare facility and 193 primary healthcare facilities distributed in LGA within the city and several private health care facilities. (Lagos state Bureau of Statistics, 2012)

3.3 Study site

The study was carried out in private funeral homes, public and private health care facilities that are located in Ibadan and Lagos metropolis. Lagos metropolis with 16 LGA's has 1 public tertiary health care facility, 23 public secondary health care facility and several private health care facilities having a total of 68 mortuary workers while Ibadan metropolis with 5 LGA's has one public tertiary healthcare facility, two public secondary healthcare facility and several private funeral homes having 60 mortuary workers distributed in LGA within the city.

3.4 Study population

The study population includes mortuary attendants and embalmers in private and government owned health care facilities and private funeral homes in Ibadan and Lagos metropolis. Mortuary

attendants hold a certificate of a certified nursing assistant or prior experience with a school leaving certificate.

3.4.1 Inclusion criteria

Mortuary attendants and embalmers who were employees of the private and government health facility and private funeral homes and who willingly gave their full consent.

3.4.2 Exclusion criteria

Mortuary attendants and embalmers who refused consent were excluded.

3.5 Sample size determination

Using the formula for single proportion, $Z\alpha^2 p(1-p)/d^2$ (Araoye, 2004)

Prevalence was set at 50%, thus sample size was calculated as

$$n = \frac{(1.96)^2 * 0.50 * (1-0.50)}{0.1^2} = 96.04$$

P is the prevalence of the outcome variable = 50%

Z as 1.96 representing 95% confidence interval.

d = desired precision of 10%

NR = 10% non-response rate.

$$NR = 10\% = \frac{n * 1}{1 - nr} = \frac{96.04 * 1}{1 - 0.10} = 106.7$$

Sample size was increased to 107.

3.6 Sampling Technique

Among the 16 local governments in Lagos metropolis, 5 local governments were randomly selected. Similarly all the five local government in Ibadan metropolis was also used for the study. The mortuary attendants and embalmers were allocated proportionally to size for each LGA and is presented in the table below.

Ibadan Metropolis: Proportional allocation according to size per LGA

LGA	Number of Mortuary attendants	Number of Questionnaires	Numbers of embalmers	Number of Questionnaires
Ibadan North	20	17	13	11
Ibadan South East	5	4	2	1
Ibadan South West	7	6	4	3
Ibadan North East	8	7	3	2
Ibadan North West	-	-	6	5
Total	40	34	28	22

3.6 Sampling Technique

Among the 16 local governments in Lagos metropolis, 5 local governments were randomly selected. Similarly all the five local government in Ibadan metropolis was also used for the study. The mortuary attendants and embalmers were allocated proportionally to size for each LGA and is presented in the table below.

Ibadan Metropolis: Proportional allocation according to size per LGA

LGA	Number of Mortuary attendants	Number of Questionnaires	Numbers of embalmers	Number of Questionnaires
Ibadan North	20	17	13	11
Ibadan South East	5	4	2	1
Ibadan South West	7	6	4	3
Ibadan North East	8	7	3	2
Ibadan North West	-	-	6	5
Total	40	34	28	22

Lagos metropolis: Proportional allocation according to size

LGA	Number of Mortuary attendants	Number of Questionnaires	Numbers of embalmers	Number of Questionnaires
Ikeja LGA	12	10	6	5
Fadaya LGA	3	3	3	3
Isole LGA	10	8	4	3
Ikorodu LGA	10	8	3	3
Idiaraba LGA	6	5	3	3
Total	41	34	19	17

3.7 Data collection instruments

This was an interviewer administered questionnaire with 45 item structured questions constructed to consist of the following sections. Section (A) Socio-demographic details of the respondents. Section (B) Awareness and Knowledge of EVD. Section (C) Attitude to EVD cases. Section (D) Attitude to PPE use. Section (E) Compliance to infectious disease control practice. Section (F) EVD Risk perception. Knowledge of EVD was assessed using a devised 6(six) item questions ranging from agent and symptoms of EVD to mode of transmission and prevention of EVD. The questionnaire was developed after a thorough review of the literature.

3.8 Validity of the instrument

In order to ensure validity of the questionnaire, the study instrument was assessed by asking a panel of experts to indicate whether or not the questions included in the questionnaire were essential based on the objectives of the study and necessary corrections were made.

A pre-test was conducted in an adjacent state specifically Osun state. This helped in correcting problems that may arise in the main data collection. In addition, the pre-test enabled the researcher to determine the trend in the responses, level of understanding of the items in the study instrument and time duration.

The reliability of the questionnaire was ensured through the translation of instrument into Yoruba language and back into English language.

3.9 Data collection technique

Data was collected using a validated interviewer administered questionnaire. The Questionnaire was also translated to the Yoruba language for easy understanding. Three Research assistants who were fluent in both speaking and writing the Yoruba language were employed and trained before administering the questionnaire. All the research assistants already had experience in field data collection and were trained on data collection. The data collection process was carried out in 6 weeks October 20th – November 26th.

3.10 Data analysis and management

3.10.1 Data Analysis

The questionnaires was divided into five sections. Section (A) Collected information on socio-demographic characteristics.

Section (B) On awareness and knowledge of Ebola Viral disease. Knowledge of EVD was assessed using a 6 item scoring system on basic information about the causative agent, symptom, route of transmission, treatment, prevention and control of the disease. Some of these questions included more than one alternative that could be chosen. Each correct response was scored 1 point while an incorrect response scoring 0. An overall knowledge score was then calculated by summing the scores for each correct response with the highest possible knowledge score of 12. A score of less than < 6 was graded as poor knowledge, while a score of ≥ 6 as good knowledge in order to carry out logistic regression. A similar scoring system was used in a study to access the knowledge of Lassa fever among healthcare workers in Osun state (Fatiregun, 2014).

Section (C) comprised of 7 questions on Attitude of mortuary attendants and embalmers to EVD. Questions covered belief of the respondents regarding EVD, stigmatization of convalescent individuals, and respondents' perception about the disease. A correct answer scored 1 point and an incorrect or 'undecided' response scored 0 points. Attitude score of < 4 was categorized into groups having poor attitude and ≥ 4 as good attitude.

Section (D) also had a 3 item questions on attitude to PPE use and was analyzed as described for section B.

Section (E) adherence to infectious disease control practices was graded by assigning scores to Likert scales on a scale of 0-2 points. Responses were scored 2 points for Always, 1 point for Sometimes and 0 points for never. A similar scoring system was used to investigate the knowledge and practice of infection control among health workers in Edo state (Tobin et al, 2013).

Section (F) Risk perception which has a 7 item question. The section covered respondents' personal risk status (Susceptibility), perception of EVD fatality(severity), and perception of morbidity (dread). Risk perception responses were separated into two categories by putting the ("serious", "very serious") and ("likely", "very likely") and ("a great deal" and "from time to time") and ("agree", "strongly agree") into a "high" perceived risk group and the rest of the responses into "low" perceived risk group. A similar scoring system was used to assess the risk perception among community members on Crimean-Congo hemorrhagic fever in Iran. (Tabataei et al, 2014)

3.10.2 Data Management

Data management plan involved sorting of the questionnaire, data entry and cleaning and data analysis was conducted with the aid of SPSS version 17.0 data sheet. Categorical variable was presented as counts and percentages. Statistical tests using the chi-square and logistic regression was done at confidence level of 95%. Chi square was used to determine the association between knowledge of Ebola viral disease and Socio-demographic variables.

3.11 Study Variables

Dependent variable: The dependent variables in this study includes knowledge of Ebola Viral Disease, awareness of Ebola Viral Disease, Risk perception of Ebola Viral Disease, attitude to EVD cases, attitude to PPE use, and adherence to the use of standard control practices.

Independent variable: The independent variables in this study includes Age, gender, religion, marital status, educational level, years of experience, health concern, risk exposure, glove usage, face shield, gown usage, nose mask, Hand washing.

3.12 Ethical consideration

Ethical clearance for this study was sought from the ethical review committee of Ministry of health, Ibadan. Permission to conduct the study was also sought from the proprietors of the private hospitals and private funeral homes. Individual consent was obtained from each of the participants and confidentiality maintained.

3.12.1 Informed consent: An informed consent form was made available in English and Yoruba language to be signed by the respondents.

3.12.2 Confidentiality of data: All forms and documents were stripped of participant's names'; unique numbers/identifiers were used for identification. Only concerned individuals was allowed to handle documents containing participants' information. Data collected was saved on a password protected computer and data backed-up to an external hard-drive. Only authorized individuals were allowed to handle participant's information

3.12.3 Beneficence to participants: All participants were educated on Ebola Viral Disease, behavioral risk factors and how to prevent spread, misconceptions about the disease were corrected.

3.12.4 Non-maleficence to participants: The risk of harm to study participants is estimated as low. Participants were educated on the best practices in preventing occupational related infection. Password protected computerized system was used for data management.

3.12.5 Voluntariness: Participation in this research was entirely voluntary. Eligible individuals were assured of their choice to either participate in the study or not.

CHAPTER FOUR

RESULTS

4.1 Survey Results

One hundred and seven questionnaires with complete data were analyzed. The survey results are presented as follows: Socio-demographic characteristics of respondents; awareness and source of information on Ebola Viral Disease; Knowledge on Ebola Viral Disease; Compliance with infectious disease control practices by respondents; Risk perception of respondents on Ebola Viral Disease; and the hypothesis test.

4.2 Socio-Demographic Characteristics of Respondents

4.2.1 Age and Sex distribution

Respondents' ages ranged from 18-75 with a mean age of 45.61 ± 11.2 years. The sex distribution of the respondents were males (89.7%) and females (10.3%). The sex and age group distribution of respondents showed that there were more males than females in both age groups (Table 4.1).

4.2.2 Occupation and Age distribution

The occupation and age-group distribution of respondents showed that there were more Mortuary attendants than Embalmers (Table 4.2). The mortuary attendants in 30-39 age group were 80.0% while 40-49 age group were 62.5%

4.2.3 Distribution of Respondents by Age, Ethnicity and Type of facility

Most of the respondents (54.2 %) were Christians, 42.1% were Muslims while (3.7%) were traditional worshippers. A large majority (86%) were from Yoruba ethnic group, 5.6% from the Igbo ethnic group, 2.8% from the Hausa ethnic group while the majority of the other ethnic groups 4.7% were the Edo's. Majority of the respondents 60.7% works at a public health facility, while 39.3% works at a private health facility (Table 4.3).

Majority of the respondents had a secondary level of education (44.1%) followed by the university educational level at 31.8%, the least was no formal education at 13.1%. About 24.3% had 10-14 years' work experience while 15.9% were the least within 15-19 years category.

Table. 4.1 Age-Group and Sex Distribution of Respondents

Age-group						
Gender	< 20	20-29	30-39	40-49	50-59	≥ 60
Male	1(100%)	4(80.0%)	27(90.0%)	29(90.6%)	23(85.2%)	12(100%)
Female	-	1(20.0%)	3(10.0%)	3(9.4%)	4(14.8%)	-

Table. 4.2 Age-Group and Occupational Distribution of Respondents

Age-group						
Occupation	< 20	20-29	30-39	40-49	50-59	≥ 60
Mortuary attendants	-	5(100%)	24(80.0%)	20(62.5%)	16(59.3%)	4(33.3%)
Embalmer	1(100%)	-	6(20.0%)	12(37.5%)	11(40.7%)	8(66.7%)

Table 4.3: Other Socio-Demographic Characteristics of Respondents ‘‘N=107’’

Variable	Number	Percentages (100%)
Age in years		
<20	1	0.9
20-29	5	4.7
30-39	30	28.0
40-49	32	29.9
50-59	27	25.2
≥ 60	12	11.2
Gender		
Male	96	89.7
Female	11	10.3
Marital status		
Married	95	88.8
Unmarried	12	11.2
Level of education		
No formal education	14	13.1
Primary	15	14.0
Secondary	44	41.1
University	34	31.8
Duration of work (years)		
1-4	20	18.7
5-9	19	17.8
10-14	26	24.3
15-19	17	15.9
≥ 20	25	23.4
Type of health facility		
Public health facility	65	60.7
Private health facility	42	39.3

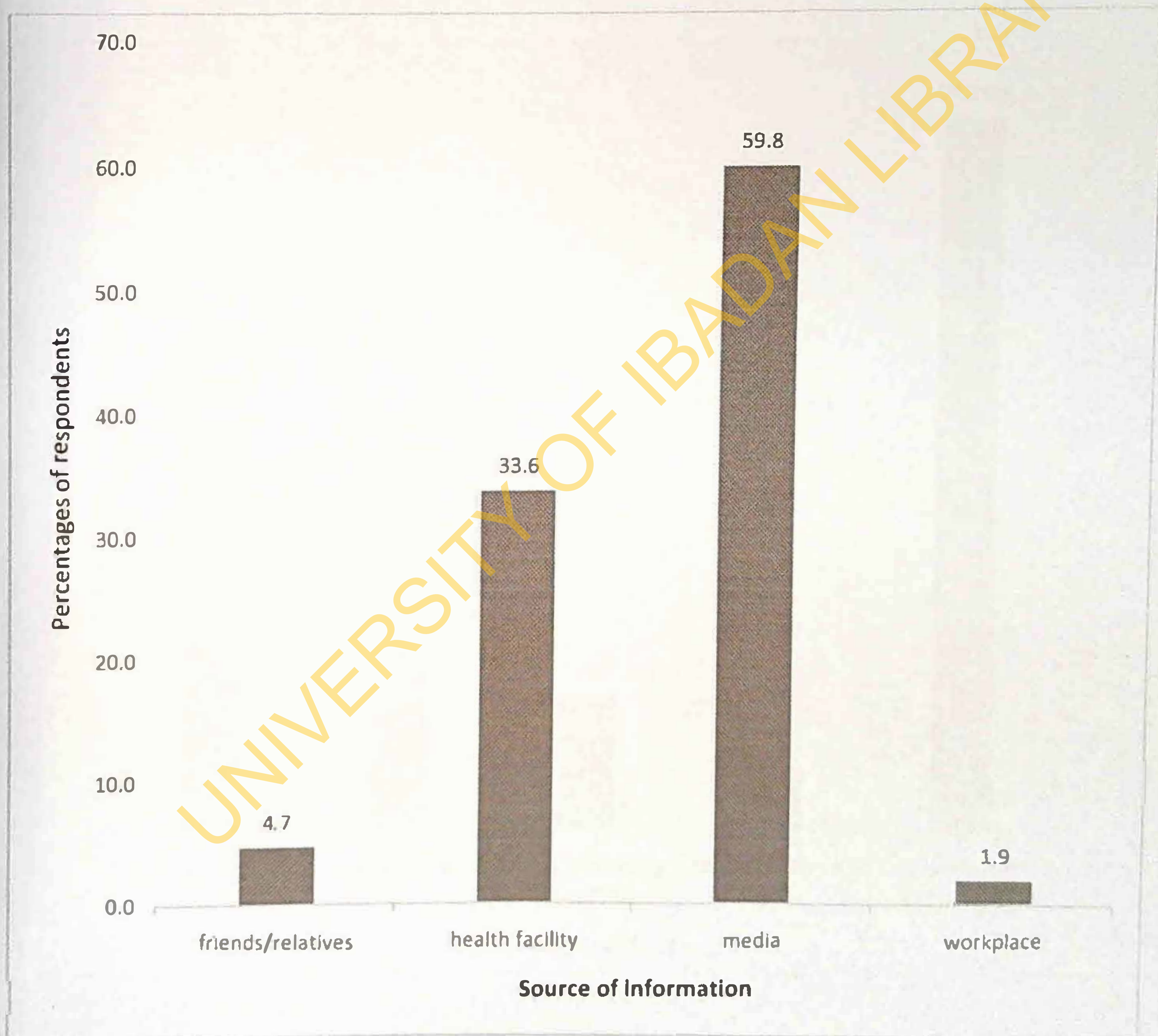
Table 4.3: Other Socio-Demographic Characteristics of Respondents “N=107”

Variable	Number	Percentages (100%)
Age in years		
<20	1	0.9
20-29	5	4.7
30-39	30	28.0
40-49	32	29.9
50-59	27	25.2
≥ 60	12	11.2
Gender		
Male	96	89.7
Female	11	10.3
Marital status		
Married	95	88.8
Unmarried	12	11.2
Level of education		
No formal education	14	13.1
Primary	15	14.0
Secondary	44	41.1
University	34	31.8
Duration of work (years)		
1-4	20	18.7
5-9	19	17.8
10-14	26	24.3
15-19	17	15.9
≥ 20	25	23.4
Type of health facility		
Public health facility	65	60.7
Private health facility	42	39.3

4.3 Awareness and Sources of information on Ebola Viral Disease

All the respondents interviewed (100%) were aware of Ebola Viral Disease and were able to mention their source of information. The source of information were mainly from the media (59.8%), followed by health facility (33.6%), friends and relatives (4.7%). A few of the respondents (1.9%) heard from the work place (Figure 4.3).

Fig 4.1: Sources of information on EVD

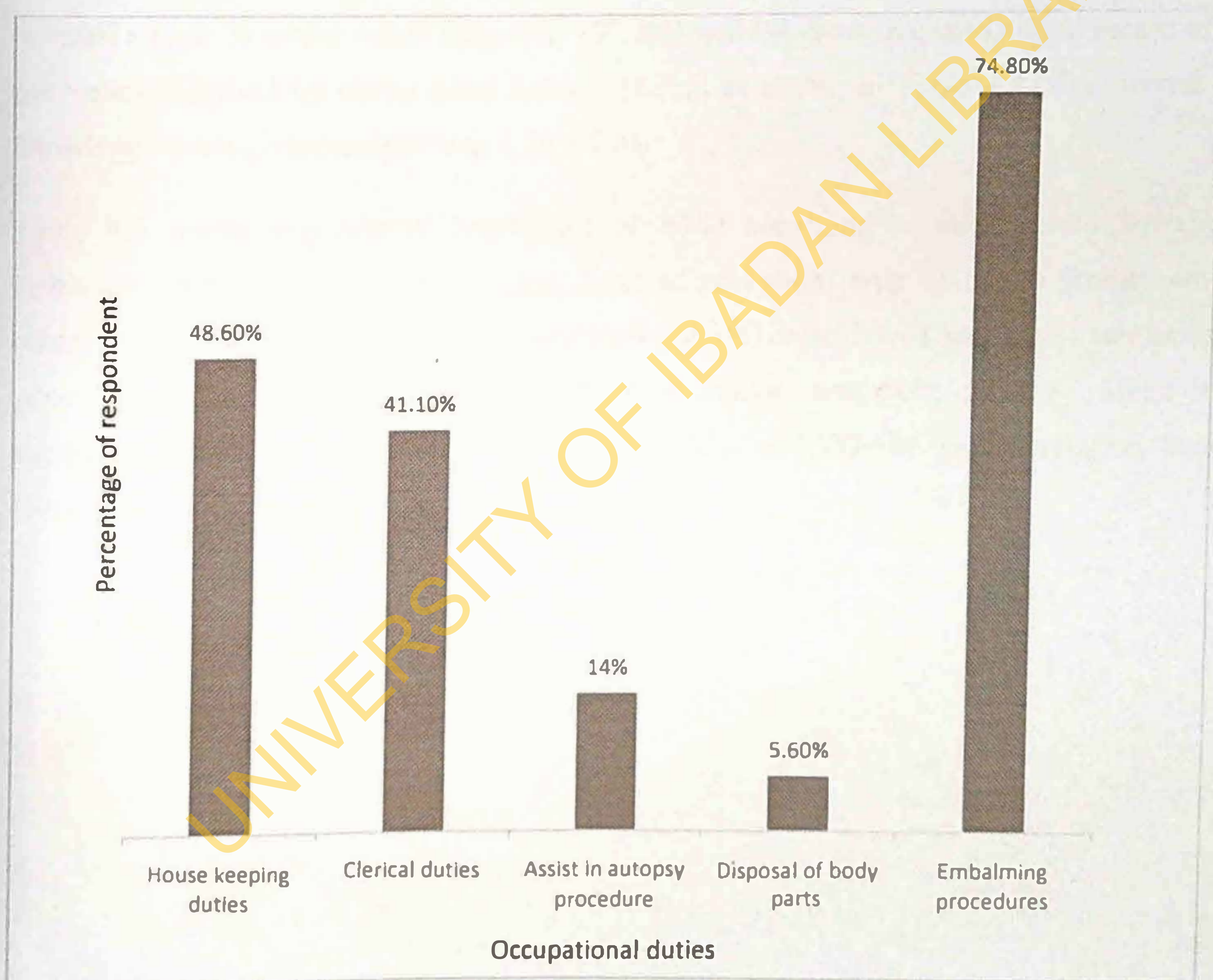


4.4 Risk Assessment

4.4.1 Occupational duties

More than half (74.8%) were involved in embalming procedures followed by housekeeping duties (48.6%), clerical duties (41.1%), assisting pathologist in autopsy procedure (14%) and disposal of body parts (5.6%) (Figure 4.4).

Fig 4.2: Distribution of Respondents' occupational duties



4.5 Knowledge of Respondents on Ebola Viral Disease

More than half of the respondents (75.7%) had good knowledge of Ebola Viral Disease (Table 4.4) mostly in the following areas: Majority of the respondents (64.5%) knew that Ebola viral disease is caused by a virus, followed by 12.1% citing EVD as being caused by spirit. Persistent fever (62.6%) was the most frequently identified symptom followed by bleeding from the nose (47.7%), bleeding from the gum (23.4%). Washing EVD infected corpse was identified as a route of EVD transmission by 75.5% of the respondents followed by bush meat (45.8%) and transmission by Air (12.1%). Majority (92.5%) of the respondents opined that washing hands after touching corpse was a way of controlling for EVD while 3.7% mentioned embalming EVD infected corpse. Washing hands frequently (97.2%) was the most frequently cited means of EVD prevention followed by eating bitter kolanut (9.3%) as shown in Table 4.4. The overall mean knowledge score of respondents was 1.76 ± 0.43 .

Table 4.5 shows respondents' knowledge of EVD according to some socio-demographic characters such as Age (years), religion, level of education, type of health facility amongst others. More than four fifth of the respondents (86.3%) interviewed in Lagos metropolis had good knowledge of EVD compared to those at Ibadan metropolis (66.1%). There was a significant association between respondents' knowledge of EVD and gender, religion, location, level of education ($p < 0.05$) {Table 4.5}

Table 4.4: Respondents' Responses on Knowledge of Ebola Viral Disease (N = 107)

Variable	Numbers (107)	Percentages (100%)
Causes of Ebola Viral Disease		
Bacteria	9	8.4
Virus	69	64.5
Spirit	13	12.1
Don't know	16	15
Variable	Yes (No/%)	NO (No/%)
Symptoms of Ebola includes		
Bleeding from the gum	25(23.4%)	82(76.6%)
Persistent fever	67(62.6%)	40(37.4%)
Bleeding from the nose	51(47.7%)	56(52.3%)
Stomach ache	4(3.7%)	103(96.3%)
Ebola can be transmitted by		
Eating bush meat	49(45.8%)	58(54.2%)
Washing Ebola infected corpse	81(75.5%)	26(24.3%)
Air	13(12.1%)	94(87.9%)
Ebola is controlled through the following		
Building separate toilet for sick individual	12(11.2%)	85(88.8%)
Wash hands after touching corpse	99(92.55)	8(7.5%)
Embalming Ebola infected corpse	4(3.7%)	103(96.3%)
Burning mattress used by Ebola infected individual	24(22.4%)	83(77.6%)
Isolate sick individuals	8(7.5%)	99(92.5%)
Ebola can be prevented by		
Bathing with salt water	2(1.9%)	105(98.1%)
Eating bitter kolanut	10(9.3%)	97(90.7%)
Washing hands frequently	104(97.2%)	3(2.8%)
Drinking salt water	107(100%)	-

Table 4.4: Respondents' Responses on Knowledge of Ebola Viral Disease (N = 107)

Variable	Numbers (107)	Percentages (100%)
Causes of Ebola Viral Disease		
Bacteria	9	8.4
Virus	69	64.5
Spirit	13	12.1
Don't know	16	15
Variable	Yes (No/%)	NO (No/%)
Symptoms of Ebola includes		
Bleeding from the gum	25(23.4%)	82(76.6%)
Persistent fever	67(62.6%)	40(37.4%)
Bleeding from the nose	51(47.7%)	56(52.3%)
Stomach ache	4(3.7%)	103(96.3%)
Ebola can be transmitted by		
Eating bush meat	49(45.8%)	58(54.2%)
Washing Ebola infected corpse	81(75.5%)	26(24.3%)
Air	13(12.1%)	94(87.9%)
Ebola is controlled through the following		
Building separate toilet for sick individual	12(11.2%)	85(88.8%)
Wash hands after touching corpse	99(92.55)	8(7.5%)
Embalming Ebola infected corpse	4(3.7%)	103(96.3%)
Burning mattress used by Ebola infected individual	24(22.4%)	83(77.6%)
Isolate sick individuals	8(7.5%)	99(92.5%)
Ebola can be prevented by		
Bathing with salt water	2(1.9%)	105(98.1%)
Eating bitter kolanut	10(9.3%)	97(90.7%)
Washing hands frequently	104(97.2%)	3(2.8%)
Drinking salt water	107(100%)	-

Table 4.5: Respondents' knowledge of Ebola Viral disease according to Socio-Demographic characteristics (N = 107)

Variable	Level of knowledge		Chi-square	p-value
	Poor knowledge	good knowledge		
Age (years)				
< 20	-	1(100%)	1.97	0.86
20-29	2(40.0%)	3(60.0%)		
30-39	6(40.0%)	24(80.0%)		
40-49	9(28.1%)	23(71.9%)		
50-59	7(25.9%)	20(74.1%)		
≥ 60	2(16.7%)	10(83.3%)		
Location of respondents				
Ibadan metropolis	19(33.9%)	37(66.1%)	5.923	*0.02
Lagos metropolis	7(13.7%)	44(86.3%)		
Gender				
Male	26(27.1%)	70(72.9%)	3.935	*0.05
Female	-	11(100%)		
Religion				
Islam	15(33.3%)	30(66.7%)	4.501	*0.03
Christian	9(15.5%)	49(84.5%)		
Level of education				
No formal education	2(14.3%)	12(85.7%)	9.494	*0.02
Primary	6(40%)	9(60%)		
Secondary	15(34.1%)	29(65.9%)		
University	3(8.8%)	31(91.2%)		
Occupation				
Mortuary attendants	15(21.7%)	54(78.3%)	0.692	0.48
Embalmers	11(28.9%)	27(71.1%)		

Table 4.5a: Respondents' knowledge of Ebola Viral disease according to Socio-Demographic characteristics (N = 107)

Variable	Level of knowledge		Chi-square	p-value
	Poor knowledge	good knowledge		
Type of health facility				
Public health facility	13(20.0%)	52(80.0%)	1.664	0.25
Private health facility	13(31.0%)	29(69.0%)		
Years of work experience				
1-4	4(20.0%)	16(80.0%)	3.62	0.46
5-9	2(10.5%)	17(89.5%)		
10-14	7(26.9%)	19(73.1%)		
15-19	6(35.3%)	11(64.7%)		
≥ 20	7(28.0%)	18(72.0%)		

*indicates p-values with significant relationships

4.6 Factors associated with knowledge on Ebola Viral Disease

In the multivariate analysis, the factor that was significantly predictive of knowledge of EVD was Location ($P < 0.05$). Table 4.6 shows that respondents living in Lagos metropolis were more knowledgeable about EVD than those in Ibadan metropolis. (OR = 4.02, 95%CI = 1.00-16.18). However, statistical significance were not found on the basis of religion, level of education and gender ($P > 0.05$).

UNIVERSITY OF IBADAN LIBRARY

Table 4.6: Multivariate logistic regression of knowledge on Ebola viral disease (N = 107)

Variables	Odds Ratio (95% CI)	P-value
Location of respondents		
Ibadan metropolis**	1	
Lagos metropolis	4.02(1.00-16.18)	*0.05
Religion		
Islam**	1	
Christianity	2.10(0.72-6.06)	0.17
Level of education		
No formal education**	1	
Primary	0.27(0.02-3.09)	0.29
Secondary	0.41(0.35-4.89)	0.48
University	1.84(0.12-28.04)	0.66

*indicates p-values with significant relationships

**Reference category

4.7 Attitude to EVD related cases

More than half of the respondents (59.8%) had poor attitude to EVD related cases. Majority of the respondents (92.5%) opined that they will not share food and drink with an individual recovering from EVD, while less than one-fifth (18.7%) agreed that suspected persons should be taken to traditional homes. Only 9.3% of the respondents interviewed accepted to attend social function with an individual who recovered from EVD. Majority (86%) disagreed that the publicity given to Ebola Viral Disease was unnecessary. Less than one-tenth (6.5%) agreed to welcome a neighbor recovering from EVD back into the community while 2.8% agreed to keep the information secret if a family contracts Ebola Viral Disease. Less than one-third (32.7%) of the respondents believed that EVD was a punishment from God. (Table 4.7)

Table 4.8 shows respondents' attitude towards EVD cases according to selected socio-demographic characteristics such as Age (years), religion, level of education, type of health facility amongst others. More than half (52.9%) of the respondents in Lagos metropolis had good attitude toward EVD cases compared with those interviewed in Ibadan metropolis (28.6%) ($p=0.01$). There were significant associations between respondents' attitude to EVD cases and gender, location, level of education and type of facility ($p<0.05$) {Table 4.8}

Table 4.7: Respondents' Attitude to EVD cases (N = 107)

Attitude	Agree (No/%)	Disagree (No/%)	Undecided (No/%)
Suspected persons should be taken to traditional homes	20(18.7%)	74(69.2%)	13(12.1%)
Will not share food and drink with recovered individual	99(92.5%)	3(2.8%)	5(4.7%)
Can attend social function with Recovered individual	10(9.3%)	94(87.9%)	5(4.7%)
Will welcome a recovered individual back into the community	7(6.5%)	95(88.8%)	5(4.7%)
Believe the publicity given to Ebola is unnecessary	5(4.7%)	92(86%)	10(9.3%)
Believe EVD is a punishment from God	35(32.7%)	48(44.9%)	24(22.4%)
Will keep the information secret if family contracts EVD	3(2.8%)	102(95.3%)	2(1.9%)

Table 4.8: Respondents' attitude to EVD cases by Socio-Demographic characteristics (N=107)

Variable	Attitude towards EVD		Chi-square	P-value
	Poor attitude	Good attitude		
Age (years)				
< 20	1(100%)	-	3.21	0.69
20-29	3(60.0%)	2(40.0%)		
30-39	16(53.3%)	14(46.7%)		
40-49	22(68.8%)	10(31.2%)		
50-59	14(51.9%)	13(48.1%)		
≥ 60	8(66.7%)	4(33.3%)		
Location of respondents				
Ibadan metropolis	40(71.4%)	16(28.6%)	6.59	*0.01
Lagos metropolis	24(47.1%)	27(52.9%)		
Gender				
Male	62(64.6%)	34(35.4%)	8.84	*0.003
Female	2(18.2%)	9(81.8%)		
Religion				
Islam	30(66.7%)	15(33.3%)	2.33	0.13
Christian	30(51.7%)	28(48.3%)		

Table 4.8a: Respondents' attitude to EVD cases by Socio-Demographic characteristics (N=107)

Variable	Attitude towards EVD		Chi-square	P-value
	Poor attitude	Good attitude		
Level of education				
No formal education	10(71.4%)	4(28.6%)	9.79	*0.02
Primary	11(73.3%)	4(26.7%)		
Secondary	30(68.2%)	14(31.8%)		
University	13(38.2%)	21(61.8%)		
Type of facility				
Public health facility	30(46.2%)	35(53.8%)	12.85	*0.000
Private health facility	34(81.0%)	8(19.0%)		

*Indicates p-values with significant relationships

4.8 Factor associated with Attitude towards EVD cases

Table 4.9 shows the result of the logistic regression. Respondents who had university education were more likely to have good attitude to EVD cases. (OR = 10.8, 95%CI = 1.73-66.72). Also those working at private health facility were less likely to have good attitude towards EVD cases (OR = 0.12, 95% CI = 0.03-0.52). Statistical significance were not found for Location and gender. ($p > 0.05$).

UNIVERSITY OF IBADAN LIBRARY

Table 4.9: Multivariate logistic regression of Attitude towards EVD cases (N = 107)

Variables	Odds Ratio (95% CI)	P-value
Location of respondents		
Ibadan metropolis**	1	
Lagos metropolis	1.39(0.32-6.12)	0.66
Gender		
Male**	1	
Female	1.41(0.21-9.61)	0.73
Level of education		
No formal education**	1	
Primary	1.44(0.25-8.42)	0.69
Secondary	2.44(0.48-12.39)	0.28
University	10.76(1.73-66.72)	*0.01
Type of facility		
Public health facility**	1	
Private health facility	0.12(0.03-0.52)	*0.005

*indicates p-values with significant relationships

**Reference category

4.9 Attitude to PPE use

Out of the 107 respondents interviewed, about four-fifth (87.9%) claimed to always use Personnel Protective Equipment (PPE) when handling corpse. Frequently cited reasons for not using PPE was limited number of PPE's in the facility (21.5%), slows down work (15%), too much work (14%), 8.4% opined that their colleagues do not wear them, while 0.9% stated it was unnecessary. (Table 4.10)

Table 4.11 shows respondents' PPE use by socio-demographic characteristics. There was significant associations between PPE use and location ($p < 0.05$). A higher proportion of respondents (100%) who live at Ibadan metropolis reported use of PPE when handling corpse compared to those living in Lagos metropolis (74.5%). Also more than four fifth (92.8%) of mortuary attendant claimed use of PPE when handling corpse compared to embalmers (78.9%). There were significant associations between respondents' age-group, religion, location, level of education, occupation, type of facility, and years of experience and use of PPE. ($p < 0.05$) {Table 4.11}.

Table 4.10: Respondents' PPE use (N = 107)

Attitude to PPE use	True (No/%)	False (No/%)
There is no penalty in not using PPE	11(10.3%)	96(89.7%)
Never been infected with any hospital related illness	22(20.6%)	85(79.4%)
Limited number of PPE's in my facility	23(21.5%)	84(78.5%)
My colleagues do not wear them	9(8.4%)	98(91.6%)
It slows down my work	16(15%)	91(85%)
There is too much work at my work place	15(14%)	92(86%)
I don't care to	1(0.9%)	106(99.1%)
It is unnecessary	1(0.9%)	106(99.1%)

Table 4.11: Respondents' PPE use by Socio-Demographic characteristics (N=107)

Variable	PPE use		Chi-square	P-value
	Yes	No		
Age (years)				
< 20	-	1(100%)	50.09	*0.00
20-29	5(100%)	-		
30-39	30(100%)	-		
40-49	32(100%)	-		
50-59	23(85.2%)	4(14.8%)		
≥ 60	4(33.3%)	8(66.7%)		
Location of respondents				
Ibadan metropolis	56(100%)	-	16.25	*0.000
Lagos metropolis	38(74.5%)	13(25.5%)		
Religion				
Islam	38(84.4%)	7(15.6%)	3.12	*0.08
Christian	55(94.8%)	3(5.2%)		
Occupation				
Mortuary attendants	64(92.8%)	5(7.2%)	4.38	*0.04
Embalmers	30(78.9%)	8(21.1%)		
Level of education				
No formal education	5(35.7%)	9(64.3%)	33.07	*0.000
Primary	12(80.0%)	3(20.0%)		
Secondary	43(97.7%)	1(2.3%)		
University	34(100%)	-		
Type of facility				
Public health facility	52(80.0%)	13(20.0%)	9.56	*0.002
Private health facility	42(100%)	-		

Table 4.11a: Respondents' PPE use by Socio-Demographic characteristics (N=107)

Variable	PPE use		Chi-square	P-value
	Yes	No		
Years of work experience				
1-4	20(100%)	-	39.53	*0.00
5-9	19(100%)	-		
10-14	25(96.2%)	1(3.8%)		
15-19	17(100%)	-		
≥ 20	13(53.0%)	12(48.0%)		

*Indicates p-values with significant relationships

UNIVERSITY OF IBADAN LIBRARY

4.10 Compliance with Infectious Disease Control Practices

Majority (98.1%) of the respondents had good compliance with Infectious disease control practices. Regarding practice of standard precautions, hand washing was always carried out by 89.7% of respondents after contact with deceased body, 91.6% after contact with contaminated instruments (Table 4.12). The regular use of face shields when undertaking procedures that could generate splashes of blood or other body fluids was reported by 43%, Half of the respondents (55.1%) claimed to always use nose mask during embalming procedures, and a minority 4.7% attested to consistently reusing disposable gloves. About three-fifth (62.6%) of the respondents claimed to regularly wear aprons when handling corpse, while 84.1% always removed soiled or wet gown as soon as possible (Table 4.12). Mortuary attendants (100%) had a higher proportion with good compliance to infectious control disease compared to embalmers (94.7%). There was no statistically significant relationship with gender, marital status, level of education, occupation and type of health facility (Table 4.13). Mean scores for the selected items of infectious disease control practices showed significantly different scores between the professions for hand washing practices and prompt removal of soiled gown, mortuary attendants having the lowest mean for the first two items (Table 4.14) ($p < 0.05$)

Table 4.12: Compliance with Infectious Disease Control Practices by Respondents

Variable	Frequency		
	Always n (%)	Sometimes n (%)	Never n (%)
Hand washing (n=107)			
Wash hands after contact with deceased body	96(89.7)	11(10.3)	-
Wash hands after contact with contaminated equipment	98(91.6%)	9(8.4%)	-
Use disinfectants after cleaning contaminated floors	93(86.9%)	14(13.1%)	-
Face mask (n=107)			
Use face shields in procedure likely to generate splashes	46(43%)	13(12.1%)	48(44.9%)
Wear nose masks during embalming procedures	59(55.1%)	28(26.2%)	20(18.7%)
Reuse disposable gloves	5(4.7%)	36(33.6%)	66(61.7%)
Gown (n=107)			
Wear aprons when handling corpse	67(62.6%)	38(35.5%)	2(1.9%)
Remove soiled/wet gown as soon as possible	90(84.1%)	17(15.9%)	-

Table 4.13: Respondents' level of compliance on Infectious Disease Control practices by Socio-Demographic characteristics

N=107

Variable	Level of compliance		chi-square	p-value
	Poor compliance	good compliance		
Age (years)				
< 20	-	1(100%)	6.94	0.18
20-29	-	5(100%)		
30-39	-	30(100%)		
40-49	-	32(100%)		
50-59	1(3.7%)	26(96.3%)		
≥ 60	1(8.3%)	11(91.7%)		
Location of respondents				
Ibadan metropolis	1(1.8%)	55(98.0%)	0.00	1.000
Lagos metropolis	1(2.0%)	50(98.0%)		
Gender				
Male	2(2.1%)	94(97.9%)	0.23	1.00
Female	-	11(100%)		
Marital status				
Married	1(1.1%)	94(98.9%)	3.08	0.21
Unmarried	1(8.3%)	11(91.7%)		
Level of education				
No formal education	1(7.1%)	13(92.9%)	5.49	0.07
Primary	1(6.7%)	14(93.3%)		
Secondary	-	44(100%)		
University	-	34(100%)		
Occupation				
Mortuary attendants	-	69(100%)	3.70	0.12
Embalmers	2(5.3%)	36(94.7%)		

Table 4.13a: Respondents' level of compliance on Infectious Disease Control practices by Socio-Demographic characteristics N=107

Variable	Level of compliance		chi-square	p-value
	Poor compliance	good compliance		
Type of health facility				
Public health facility	2(3.1%)	63(96.9%)	1.32	0.52
Private health facility	-	42(100%)		
Years of work experience				
1-4	-	20(100%)	3.95	0.14
5-9	-	19(100%)		
10-14	-	26(100%)		
15-19	-	17(100%)		
≥ 20	2(8.0%)	23(92.0%)		

Table 4.14: Mean scores for Infectious Disease Control Practices by occupation

Variables	Occupation		F-Test	P-value
	Mortuary Attendants	Embalmer		
Mean (S.D)				
Hand wash	1.04(0.21)	1.91(0.97)	4.25	*0.04
Face shield	1.91(0.97)	2.21(0.88)	2.48	0.12
Nose mask	1.72(0.84)	1.47(0.65)	2.56	0.11
Soiled gown	1.10(0.30)	1.26(0.45)	4.93	*0.03
Reuse gloves	2.58(0.58)	2.55(0.60)	0.05	0.82

*Indicates p-values with significant relationship

4.11 Respondents' risk perception on Ebola Viral Disease

More than four fifth (86.9%) of respondents had a high risk perception towards EVD mostly in the following issues: Ebola is a fatal disease (74.8%), possibility of contracting infectious disease (susceptibility) 32.7%, Possibility of contracting EVD due to occupation 41.1%, level of confidence in avoiding infectious disease (47.7%), consequences of Ebola(severity) (58.9%) as shown in table 4.15.

Table 4.16 shows the perceived risk category among respondents in Ibadan and Lagos metropolis. Approximately 90 % the respondents in both groups reported the risk of EVD to be 'serious' or 'very serious'. A greater proportion of respondents in Lagos metropolis reported the perceived EVD risk as 'very serious' (60.8% versus 57.1%), although the difference was not statistically significant. ($p=0.77$)

Table 4.17 shows the perceived risk group according to socio-demographic characteristics. There was a significant association between respondents' gender and their perceived risk group ($p < 0.05$). Respondents who are males had a higher perceived risk (89.6%) than the females (63.6%). Also respondents in Ibadan metropolis (96.4%) had an overall higher risk perception compared to respondents in Lagos metropolis (76.5%). The difference was statistically significant. ($p=0.002$). Mortuary attendants had a higher perceived risk (88.4%) than embalmer (84.2%). There were significant associations between respondents' perceived risk group and their gender, location and type of health facility. ($p<0.05$) {Table 4.17}.

Table 4.15: Risk perception of respondents on Ebola Viral Disease**N=107**

Variable	Number (107)	Percentages (100%)
Severity		
The consequences of Ebola		
Not serious	1	0.9
Somewhat serious	4	4.7
Undecided	4	3.7
Serious	35	32.7
Very serious	63	58.9
Dread		
Worry about EVD		
Not at all	9	8.4
Rarely	13	12.1
Undecided	5	4.7
From time to time	36	33.6
A great deal	44	41.1
Susceptibility		
Possibility of contracting EVD due to occupation		
Strongly disagree	5	4.7
Disagree	8	7.5
Don't know	1	0.9
Agree	49	45.8
Strongly agree	44	41.1

Table 4.15a: Risk perception of respondents on Ebola Viral Disease

N=107

Variable	Number (107)	Percentages (100%)
Agree that EVD corpse is not contagious to staff		
Strongly agree	6	5.6
Agree	23	21.5
Undecided	8	7.5
Disagree	27	25.2
Strongly disagree	43	40.2
Go to hospital when experiencing high fever		
Yes	99	92.5
No	8	7.5
Possibility of contracting infectious disease		
Very unlikely	42	39.3
Unlikely	6	5.6
Undecided	3	2.8
Likely	21	19.6
Very likely	35	32.7

Table 4.16: Reported perceived risk by Respondents' area of residence (N = 107)

Variable	Location (Metropolis)			chi-square	p-value
	Ibadan	Lagos	Total		
Consequences of contracting EVD					
Not serious	1(1.8%)	-	1	1.82	0.77
Somewhat serious	2(3.6%)	2(3.9%)	4		
Undecided	3(5.4%)	1(2.0%)	4		
Serious	18(32.1%)	17(33.3%)	35		
Very serious	32(57.1%)	31(60.8%)	63		

UNIVERSITY OF IBADAN LIBRARY

Table 4.17: Respondents' risk perception by Socio-demographic characteristics

Variable	EVD Perceived risk		Chi square	P-value
	High	low		
Age (years)				
< 20	-	1(100%)	8.43	0.13
20-29	4(80.0%)	1(20.0%)		
30-39	28(93.3%)	2(6.7%)		
40-49	27(84.4%)	5(15.6%)		
50-59	23(85.2%)	4(14.8%)		
≥ 60	11(91.7%)	1(8.3%)		
Location of respondents				
Ibadan metropolis	54(96.4%)	2(3.6%)	9.35	*0.002
Lagos metropolis	39(76.5%)	12(23.5%)		
Gender				
Male	86(89.6%)	10(10.4%)	5.84	*0.036
Female	7(63.6%)	4(36.4%)		
Level of education				
No formal education	12(85.7%)	2(14.3%)	1.51	0.69
Primary	12(80.0%)	3(20.0%)		
Secondary	38(86.4%)	6(13.6%)		
University	31(91.2%)	3(8.8%)		
Occupation				
Mortuary attendant	61(88.4%)	8(11.6%)	0.38	0.560
Embalmer	32(84.2%)	6(15.8%)		
Type of facility				
Public health facility	53(81.5%)	12(18.5%)	4.21	*0.04
Private health facility	40(95.2%)	2(4.8%)		

Table 4.17a: Respondents' risk perception by Socio-demographic characteristics

Variable	EVD Perceived risk		Chi square	P-value
	High	low		
Years of work experience				
1-4	19(95.0%)	1(5.0%)	7.94	0.06
5-9	14(73.7%)	5(26.3%)		
10-14	20(76.9%)	6(23.1%)		
15-19	16(94.1%)	1(5.9%)		
≥ 20	24(96.4%)	1(4.0%)		

*Indicates p-values with significant relationship

UNIVERSITY OF IBADAN LIBRARY

4.12 Multivariate analysis of factors associated with EVD risk perception

Table 4.18 shows the result of the multivariate model, the only factor that was predictive of EVD risk perception was years of work experience. Respondents with more than 15 years' work experience were less likely to have a high EVD perceived risk (OR = 0.13, 95%CI = 0.02-0.72).

UNIVERSITY OF IBADAN LIBRARY

Table 4.18: Multivariate logistic regression for respondents' characteristics and risk perception on Ebola viral disease

Variables	Odds Ratio (95% CI)	P-value
Years of work experience		
< 15 years**	1	
≥ 15 years	0.13(0.02-0.72)	*0.019

*indicates p-values with significant relationships

**Reference category

UNIVERSITY OF IBADAN LIBRARY

4.13 Respondents' area of residence

Among the 107 respondents studied, 52.3% were from Ibadan metropolis while 47.7% from Lagos metropolis. Ibadan metropolis had the major respondents that were males compared to respondents in Lagos (78.4%) with 21.6% female respondents. 96.4% are predominantly Yoruba's in Ibadan metropolis compared to respondents in Lagos metropolis (74.5%) with other ethnic groups. Respondents in Ibadan had the highest proportion of embalmers as shown in Table 4.19.

There were significant associations between respondents' area of residence by the age group, gender, ethnic group, level of education, type of facility and years of work experience. ($p < 0.05$)

{Table 4.19}

UNIVERSITY OF IBADAN LIBRARY

Table 4.19: Respondents' socio-demographic characteristics by area of residence

Variable	Location (Metropolis)		Chi square	P-value
	Ibadan	Lagos		
Age (years)				
<20	-	1(100%)	25.97	*0.000
20-29	4(80.0%)	1(20.0%)		
30-39	23(76.7%)	7(23.3%)		
40-49	20(62.5%)	12(37.5%)		
50-59	8(29.6%)	19(70.4%)		
≥ 60	1(8.3%)	11(91.7%)		
Gender				
Male	56(58.3%)	40(41.7%)	13.46	*0.000
Female	-	11(100%)		
Ethic group				
Yoruba	54(58.3%)	38(41.3%)	12.78	*0.012
Ibo	-	6(100%)		
Hausa	-	3(100%)		
Edo	2(40.0%)	3(60%)		
Level of education				
No formal education	-	14(27.5%)	23.18	*0.000
Primary	5(33.3%)	10(66.7%)		
Secondary	30(68.2%)	14(31.8%)		
University	21(61.8%)	13(38.2%)		
Occupation				
Mortuary attendants	34(49.3%)	35(50.7%)	0.73	0.393
Embalmers	22(57.9%)	16(42.1%)		
Type of facility				
Public health facility	14(21.5%)	51(78.5%)	62.96	*0.000
Private health facility	42(100%)	-		

Table 4.19a: Respondents' socio-demographic characteristics by area of residence

Variable	Location (Metropolis)		Chi square	P-value
	Ibadan	Lagos		
Years of work experience				
1-4	16(80.0%)	4(20.0%)	8.72	0.06
5-9	9(47.4%)	10(52.6%)		
10-14	14(53.8%)	12(46.2%)		
15-19	7(41.2%)	10(58.8%)		
≥ 20	10(40%)	15(60.0%)		

*Indicates p-values with significant relationship

UNIVERSITY OF IBADAN LIBRARY

Table 4.20: The distribution of respondents knowledge and attitude score by perceived risk group

	EVD Perceived risk		Chi square	P-value
	High	low		
Knowledge score				
< 6	24(92.3%)	2(7.7%)	0.87	0.51
≥ 6	69(85.2%)	12(14.8%)		
Attitude score				
< 4	60(93.8%)	4(6.2%)	6.54	0.017
≥ 4	33(76.7%)	10(23.3%)		

The correlation estimate for the association between total knowledge and attitude scores was statistically significant (Pearson's correlation coefficient = 0.242, $p = 0.012$).

Table 4.20 compares total knowledge and attitude scores between 'high' and 'low' perceived risk groups. A greater proportion of respondents with poor knowledge score had a high EVD perceived risk (92.3%), although the difference was not significant ($p=0.51$). 64.5% of respondents in the 'high' perceived risk group had poor attitude scores of 4 and below compared to those with good attitude (76.9%), the difference was statistically significant ($p=0.017$).

4.14 QUALITATIVE ANALYSIS

4.14.1 Focus group discussion (FGD)

Focus group discussions (FGD) were held with mortuary attendants and Embalmers in Ibadan metropolis. Each FGD was conducted among respondents working at a tertiary health facility (THF), a secondary (SHF) and a private health facility (PHF). In each health facility, the sample comprised of respondents aged 32-56 years, Christians and Muslims, willing to participate in the study and having at least one year of work experience. Prior appointments were made with respective facilities before conducting the discussions. The discussions were held in Yoruba and tape-recorded after obtaining participants permission. Notes were also taken, so that no discussion point was missed. Discussions were carried out with the help of guiding and probing questions. The answers of the majority were presented as the "Response", while comments that were significant but not shared by the majority were labelled as "Additional comments". The study was undertaken between November 2014 and January 2015.

4.14.2 Participants

A total of 18 participants, which is 12 mortuary attendants and 6 embalmers participated in the research. The minimum number of participants in FGDs was six. The mean age of the participants was 40.22 (range 32-56). Among them, 72.2% were Christians and mortuary attendants (66.7%) (Table 1)

Table 4.21: Facility-wise socio-demographic variables of the participants (n=18)

Type of health facility	Age range, years	Mean age, years	Christians	Muslims
Tertiary health facility	32-42	37	5	1
Secondary health facility	40-56	47.1	3	3
Private health facility	32-45	38.5	5	1
Total	32-56	40.8	13	5

4.14.3 Knowledge on Ebola Viral Disease (EVD)

Out of the three groups, two had sufficient knowledge on EVD, its causes and symptoms, the group from Secondary health facility had insufficient knowledge on the disease.

Response: "I don't know anything about Ebola, I just heard of it from radio station" Mr O, Age 50 years (SHF). All the respondents mentioned radio and television as their source of information. The three groups also believed that western treatment was the better alternative in managing cases of Ebola.

Response: "Yes, I believe in orthodox treatments for treating Ebola patient, because some were treated in Lagos where they built for treating Ebola patient and they are totally okay, parts of them was the nurse that welcomed Patrick sawyer she survived it" Mr A, Age 39 years (THF)

4.14.4 Risk perception regarding EVD

The three groups reported a high perceived risk regarding Ebola virus and expressed fear of contracting it due to the nature of their job, they all expressed gratitude for the seminars that enlightened them about the disease.

Response 1: "Yes, because the type of work we do is a bit dangerous, different type of corpse are being brought into mortuary without knowing the cause of their death" Mr G, 45 years (SHF)

Response 2: "Yes, it's a job that exposes us to different kind of disease or even we are talking about it, if we do not take to procedure or follow every necessary steps to protect ourselves, so it's a job that allows different disease to afflict its workers" Mr B, Age 42 years (THF)

In response to questions asked about fear of EVD

Response 2: "Im afraid of Ebola so much, when we heard of it (at first), we were so afraid to the extent that we mortuary workers refused to shake one another, we were avoiding each other" Mr F, Age 36 years (THF)

4.14.5 Attitude to EVD cases

The opinions expressed by the groups in the tertiary and secondary health facility was favorable towards individuals recovered from Ebola as compared to those from the private health facility which was unfavorable.

4.14.3 Knowledge on Ebola Viral Disease (EVD)

Out of the three groups, two had sufficient knowledge on EVD, its causes and symptoms, the group from Secondary health facility had insufficient knowledge on the disease.

Response: "I don't know anything about Ebola, I just heard of it from radio station" Mr O, Age 50 years (SHF). All the respondents mentioned radio and television as their source of information. The three groups also believed that western treatment was the better alternative in managing cases of Ebola.

Response: "Yes, I believe in orthodox treatments for treating Ebola patient, because some were treated in Lagos where they built for treating Ebola patient and they are totally okay, parts of them was the nurse that welcomed Patrick sawyer she survived it" Mr A, Age 39 years (THF)

4.14.4 Risk perception regarding EVD

The three groups reported a high perceived risk regarding Ebola virus and expressed fear of contracting it due to the nature of their job, they all expressed gratitude for the seminars that enlightened them about the disease.

Response 1: "Yes, because the type of work we do is a bit dangerous, different type of corpse are being brought into mortuary without knowing the cause of their death" Mr G, 45 years (SHF)

Response 2: "Yes, it's a job that exposes us to different kind of disease or even we are talking about it, if we do not take to procedure or follow every necessary steps to protect ourselves, so it's a job that allows different disease to afflict its workers" Mr B, Age 42 years (THF)

In response to questions asked about fear of EVD

Response 2: "Im afraid of Ebola so much, when we heard of it (at first), we were so afraid to the extent that we mortuary workers refused to shake one another, we were avoiding each other" Mr F, Age 36 years (THF)

4.14.5 Attitude to EVD cases

The opinions expressed by the groups in the tertiary and secondary health facility was favorable towards individuals recovered from Ebola as compared to those from the private health facility which was unfavorable.

Response 1: Yes, nothing should stop us from relating with them inasmuch as Doctor had certify okay from Ebola only that one needs to be careful and be neat always” Mr O, Age 50 years (SHF)

Response: “I cannot relate with such person” Mr D, Age 35 years (PHF). Some respondents opined that Ebola was a punishment from God

Response: According to the religion I practice, I got to know that Ebola is caused by God’s punishment and annoyance”. Mr F, Age 36 years (SHF).

4.14.6 Attitude to PPE use

All the groups claimed to use PPE in their places of work. Although the group at the tertiary health facility complained of insufficient PPE and were forced to buy themselves.

Response 1: “Yes, we were not given at all, we provided it by ourselves, even we might not protect ourselves if we are not doing work that is too serious inside mortuary” Mr G, Age 45 years (SHF)

4.14.7 Behavioral risks predisposing to infection

One out of the three groups reported risky behavior that can predispose to infection. The group at the secondary health facility reported eating and cooking in the mortuary.

Response: “Yes, we do eat s while we are at work, we cook here (mortuary) at times if condition warrants it” Mr OG, Age 56 years (SHF)

4.14.8 Adherence to infectious disease control practices

The three groups reported good adherence to infectious disease control practice. Quotations from FGD participants portraying their opinion are documented below.

Response 1: “Yes we do wash our hands with soap and Izal all the time after working inside the mortuary” Mr G Age 45 years (SHF)

Response 2: It is all the time we use all our PPE, for instance glove mentioned is worn double fold because if we put on just one, it can tear off when use” Mr A, 39 years (THF)

Response 3: It is compulsory for us to wear PPE, because after leaving mortuary we must of it from our body immediately before we mix up in the society. Mr B, Age 45 years (PHF)

Table 4.22

Objectives	Tertiary Health Facility (THF)	Secondary health facility (SHF)	Private health facility (PHF)
Knowledge of EVD	++ -	+ -	+ -
Attitude to EVD cases	++ -	+ -	++ -
Attitude to PPE use	++ -	++ -	++ -
Behavioral risks	+ -	++ -	+ -
Adherence to IDCP	++ -	++ -	++ -

KEY

- ++ - where most of the participants expressed the opinion
- + - where the opinions where expressed by very few participants
- - Where the opinion where not expressed at all

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

This study assesses the risk perception, knowledge regarding EVD and compliance with infectious disease control practices. Though no published study assessing EVD risk perception among mortuary attendants and embalmers was found, comparisons were made with other viral hemorrhagic fevers.

5.1 Knowledge on EVD among respondents

The key finding in this study is that respondents were all (100%) aware of the Ebola virus. This is similar to a study done in Kenema, Sierra Leone (UNICEF, 2014). The role the media plays showed that the media (59.8%) remains the verifiable source of disseminating information to the public. Although it serves both literate and illiterate persons, it is important that these vulnerable group be given continuous training for epidemic prone disease like Ebola and infectious disease control (Aigbiremolen et al, 2012).

The study found majority (75.7%) of the respondents to have good knowledge regarding EVD. This finding is similar to a study conducted in Sierra Leone regarding EVD and in Nigeria, Edo state among physicians regarding Lassa fever (UNICEF, 2014; Aigbiremolen et al, 2012). Majority (78.3%) of Mortuary attendants had good knowledge about EVD compared to Embalmer. The disparity found between the two professions may be due to the greater attention given to awareness than in-depth knowledge. Furthermore it could also be due to the frequent trainings conducted for mortuary attendants in government owned health facilities as compared to twice in a year as reported by some private health facilities during FGD sessions.

This study showed that respondent working in private health facility had the lowest proportion (69.0%) with good knowledge of EVD. Although it was not significant. This finding is contrary to a study conducted in Edo state among physicians on Lassa fever with 90% of respondents in private health facility with good knowledge (Aigbiremolen et al, 2012). Majority (47.7%) of the respondents had work experience of less than 10 years which is almost similar to that reported by Abdulraheem et al, 2012.

The most frequently cited symptom was persistent fever (62.6%) followed by bleeding from the nose (47.7%). Bleeding from the nose is the most frequent symptom mortuary attendants and embalmers associate with Ebola disease during the FGD sessions conducted in this study.

WHO recommends cremation or prompt burial of corpse in a hermetically sealed casket. Embalming must not be carried out on patients who died of Ebola, this is because of the risk of occupational exposure to Ebola virus (WHO, 2014; CDC, 2014). Minority (3.7%) of the respondents opined that they could embalm EVD infected corpse and that eating bitter Kolanut (9.3%) was a form of EVD prevention. Harmful traditional burial practices such as washing or touching the body of Patients that died of Ebola have exposed family members to EVD infection unknown to them. It is important that mortuary attendants and embalmers are adequately informed to avoid spreading the disease in the community. (WHO, 2014, Tobin et al, 2013)

Another finding in this study is that respondents in Lagos metropolis were more likely to be knowledgeable about Ebola than those in Ibadan metropolis. This is due likely to the media sensitization in Lagos state which once experienced an outbreak of EVD in the state.

5.2 Risk perception on EVD among respondents

This study found 86.9% of the respondents to have an overall high risk perception towards EVD. A similar result was found in a study conducted in Iran on Crimean Congo hemorrhagic fever (Tabatabaei et al, 2014). Also majority of the respondents (32.7%) believe that they are at risk of contracting infectious disease (susceptible). This finding is similar to the study conducted in Sierra Leone with 34 % of the respondent believing that they are at great risk of contracting Ebola (UNICEF, 2014).

This study shows that majority (57.1% versus 60.8%) of the respondents had a "high" perceived risk to EVD irrespective of their area of residence. (Table 4.16). Studies has shown that the risk perceptions for viral hemorrhagic diseases are high especially when people witness disease outbreak. Ebola is associated with a high case fatality rate (up to 90%). It is recognized as a deadly disease more so by the mass media in their presentation, this is likely to have influenced risk perception among the study population. (CDC, 2014; WHO, 2014; Tabatabaei, 2014; Ustun, 2004)

About 39.3% of the respondents believed that they are very unlikely to contract any infectious disease. This may be based on a reasoning process that encourages them to think that the deadly virus is not a real threat, resulting in a 'self-exempting' optimistic bias. (Branstrom and Brandberg, 2010). It is worrisome that 5.6% of respondents believe that a patient that died of Ebola is still not contagious to hospital staff. It is imperative that such false assumptions should be corrected by relevant health authorities.

Another finding in this study is that respondents residing in Ibadan metropolis (96.4%) had a higher proportion with higher risk perception to EVD compared to those in Lagos metropolis (76.5%) {Table 4.17}. This may be due to the failure of respondents in Lagos metropolis to apply the information in a consistent way so as to formulate a judgment of their own vulnerability to Ebola even though the city first experienced the outbreak (Tabatabaei et al, 2014; Branstrom et al, 2010).

This study also revealed that respondents that had poor knowledge to EVD also had a high risk perception to EVD (92.3%). {Table 4.20}. This is due likely to misinformation regarding EVD compounded with unhealthy fear. The erroneous belief that EVD is still contagious even after an individual makes full recovery is still prevalent among respondents in this study hence the poor attitude. This has been captured in the FGD sessions.

5.3 Attitude on EVD cases among respondents

A key finding in this study is that more than half of the respondents (58.9%) had poor attitude to EVD related cases. The Nigerian Federal Ministry of Health (FMOH) has been campaigning against the discrimination of survivors of Ebola, within and outside Nigeria. Persons that have recovered from EVD even after months after the ordeal have experienced a wide number of discriminations ranging from losing jobs, being forced out of their homes, to outright refusal by sellers in trading with them (FMOH, 2014). This finding is similar to the study conducted in Sierra Leone with a high level of discrimination (76%) (UNICEF, 2014).

About 18.7% of respondents prefer to take sick individual to traditional homes. This finding has implications for spread of this deadly disease in the community. FMOH strongly recommends that sick individuals be taken to the nearest health facility and isolated and that alert cases should be reported to the nearest health facility (FMOH, 2014; WHO, 2014). This finding is different

from that done in Sierra Leone with 95% believing that individuals must be admitted in an Ebola treatment center. (UNICEF, 2014)

This result showed associations between respondents' attitude and location. Respondents residing in Lagos metropolis have a higher proportion (52.9%) with good attitude than those in Ibadan metropolis (52.9%). This may be due to their level of exposure to Ebola outbreak that occurred in Lagos and media sensitization concerning individuals fully recovered from EVD.

Another key finding in this study is that those with primary education were more likely to have good attitude towards Ebola recovered individuals. (McArthur et al, 2001). In this present study those who had higher educational certificate such as secondary and university degree had a higher proportion with good attitude towards EVD recovered cases.

5.4 Attitude to PPE use among respondents

This study found that majority (87.9%) of the respondents had good attitude to PPE use. This finding is different from that conducted in Borno state which reported 55.5% PPE use among physicians. (Abdulraheem et al, 2012)

The most frequently cited reasons for non-PPE use by some respondents was unavailability (21.5%) in the health facility. In Nigeria, many health facilities in the rural areas have limited number of health facilities mainly as a result of limited funds, this makes implementation of infection control practice difficult (Tobin et al, 2013; Okechukwu et al, 2012).

The mention of use of gloves and aprons as preference for PPE was frequently cited during the FGD sessions conducted.

The hand glove though an important PPE, is not the only gear for infectious disease control and should include other gears such a gown, face shield, eye google, Apron, rubber booths, head covering, mask etc. (WHO, 1998; CDC, 2011). The frequent mention of these items is similar to what was reported among Doctors and nurses in a study carried out in Edo state (Tobin et al, 2013) and in Abuja (Okechukwu et al, 2012) and in Balochistan, Iran (Sheikh et al, 2004).

5.5 Adherence to infectious disease control practices among respondents

This study shows that majority (98.1%) of the respondents have good adherence to infectious disease control practice. This finding is better than a study conducted among health care workers in Edo state which recorded a good compliance of 46.8% (Tobin et al, 2013). The practice of hand-washing by majority (91.6%) of the respondents after contact with contaminated equipment also collaborates the finding of Tobin et al, 2013 but different from the study conducted by Abdulraheem et al, (2013) with a report of 38.7%.

The use of face shield by 43% of the respondents in this study also collaborates the same Tobin et al (51.2%). Regular use of nose mask (55.1%) contradicts the finding of Tobin et al (2013) which recorded 32.4%. This study found 84.1% of the respondents to remove soiled/wet gown/gown/Aprons as soon as possible which also contradicts the study conducted by Tobin et al, 2013.

In this study non-compliance among some workers claimed to be due to work load (14.0%), insight that colleagues fail to follow (8.4%), lack of penalty for not wearing (10.3%), and lack of dexterity when wearing them (15%). (Abdulraheem et al, 2012)

However there was no significant association between level of compliance and socio-demographic variables. This could be due to the small sample size used in this study. For example, respondents with secondary and university education had a higher compliance (100%) than those with no formal education (92.9%) ($p=0.007$).

Also, females had a higher proportion with good compliance 11 (100%) compared to males with 94(97.9%). ($p=1.000$). Therefore it is recommended that further research be conducted with a larger sample size to give a better representation of the population.

The higher proportion (100%) with good level of compliance observed among mortuary attendants (100%) though not significant may be due to their participation in greater number of seminars, and trainings.

Mean scores for hand washing and prompt removal of soiled/wet gown was significant between mortuary attendants and embalmers. This is similar to the study conducted by Tobin et al, 2013 among health care workers which was also significant for the selected items.

5.6 Behavioral risks of respondents

During the FGD sessions, a behavioral risks was mentioned by participants and includes the practice of cooking and eating in the mortuaries. This is a dangerous trend which can lead to grave consequences. The exposure of cooking items and cutleries in the morgue can lead to hospitals acquired infection of EVD

5.7 Summary of findings and their Implication

- There was a high level of awareness and knowledge of Ebola Viral Disease. However areas such as embalming of EVD corpse and some erroneous forms of prevention as opined by some respondents need to be corrected.
- There was a high risk perception among respondents
- There was poor attitude to individuals who have recovered from EVD. Discrimination against Ebola survivors has physical and psychosocial effect.
- The erroneous belief that traditional homes are better suited to treat EVD victims need to be corrected. Interventions should focus on behavioral change communication.
- Although the attitude to PPE use was high, there were insufficient number of PPE reported in some facilities. This has implication on implementation and compliance with standard control practices
- Although there was high adherence to infectious disease control practice. Misconception about the importance of other PPE's need to be addressed through interventions to improve knowledge on SP.
- Risky behavioral practices such as cooking and eating in the morgue should be addressed and provision made for alternative venue for staff.

5.8 Limitations of the study

Since the study was conducted in Ibadan and Lagos metropolis, it may not be an adequate representation of the entire population of mortuary attendants and embalmers in Nigeria.

5.9 Conclusion

In this study, overall knowledge regarding Ebola virus disease was high, however respondents in Lagos were more knowledgeable about Ebola virus disease than those in Ibadan. This may be due to the outbreak recently experienced in the state and the ensuing media sensitization. Though more than half of the respondents also had a high EVD risk perception, respondents in Ibadan had high risk perception than those in Lagos. More so, a general high level of compliance was observed among mortuary attendants and embalmers. However among those that didn't comply limited number of PPE's was frequently cited as the reason for non-use.

6.0 Recommendation

Based on the findings from this study, the following recommendations are offered:

1. Education campaigns consisting of seminars, pamphlets, and workshops that would pay added attention to bridging gaps in knowledge.
2. There should be sustained health messages. This is because the more people are aware of the risk of Ebola, the better they perceive it. Programs integrating risk communication should be provided to bridge gaps in knowledge.
3. Health authorities should organize on a regular basis practice oriented training programs for mortuary attendants and embalmers on infectious disease control.

REFERENCES

- Abegunde A.A, Omisore E.O, Oluodo O.F, Olaleye D. 2009. Commercial horticultural practice in Nigeria: Its socio-spatial effects in Lagos city. *Afr. J. Agric. Res.* 4(10):pp1064-1072.
- Adetokunbo O.L, Herbert M.G 2003. Short textbook of Public Health Medicine for the Tropics. Revised Edition. Published by Hodder Arnold. Pp 105-106.
- Ali S.K, Tshioko F.K, Heyman D.L, Guenno B, Nabeth P, Kerstiens B et al. The Reemergence of Ebola Hemorrhagic fever, Democratic Republic of the Congo, 1995. *J. Infect. Dis* 179(1):S76-86.
- Araoye, M.O 2003: Research methodology with statistics for health and social sciences. Ilorin: Nathadex publishers.
- Bausch D.G, Towner J.S, Dowell S.F, Kaducu F, Lukwiya M, Sanchez A, Nichol S.T, Ksiazek T.G, Rolling P.E. 2007. Assessment of the risk of Ebola virus transmission from bodily fluids and fomites. *J. Infect. Dis* 196: S142-7
- Branstrom R, Brandberg Y. Health risk perception, optimistic bias, and personal satisfaction. *Am. J. Health Behav.* 2010: 34(2): 197-205
- Bray M. 2014. Epidemiology, pathogenesis and Clinical manifestations of Ebola and Marburg virus disease. Topic 3023 Version 17.0
- Centers for Disease Control and Prevention and World Health Organization. 1998. Infection Control for Viral Hemorrhagic Fevers in the African Health Care Setting. Atlanta, Georgia, US: Centers for Disease Control and Prevention. Retrieved 8 February 2013
- Centre for Disease Control (CDC). 2014. CDC Telebriefing on Ebola outbreak in West Africa. 28 July 2014. Retrieved 3rd August 2014.
- Centre for Disease Control and Prevention (CDC). 2014 Ebola Outbreak in West Africa. Weekly Epidemiological Report.
- Centre for Disease Control and Prevention (CDC). June 27, 2014. Ebola Viral Disease Outbreak- West Africa, 2014. *MMWR* 63(25): 548-551.
- Centre for Disease Control and Prevention (CDC). September 6, 2014. 2014 Ebola Outbreak in West Africa- Outbreak Distribution Map. *MMWR*.

- Centre for Disease Control and prevention (CDC). April, 2010. Ebola Hemorrhagic fever information packet. Fact Sheet. 9th April, 2010
- Centre for Disease Control. 2014. Guidance for safe handling of Human Remains of Ebola Patients in U.S Hospitals and Mortuaries. Retrieved 10 October 2014.
- Clark D.V, Jarhling P.B, Lawler J.V. 2012. Clinical management of filovirus-infected patients. *Viruses*.4:1998-1686
- Dowell S.F, Mukunu R, Ksiazek T.G, Khan A.S, Rollin P.E, Peters C.J.1999. Transmission of Ebola Hemorrhagic fever: A study of risk factors in family members, Kikwit, Democratic Republic of Congo, 1995. *J. Infect. Dis* 179(Suppl1):S87-91.
- European Centre for Disease Prevention and Control.2014. Outbreak of Ebola virus disease in West Africa. 8th April 2014. Stockholm: ECDC; 2014.
- Evans A.S.1989. *Viral infections of Humans; Epidemiology and control*. Third edition. Plenum medical book company. pp 95-103
- Fasoranti O.O, Aruna J.O. (2007). A Cross-Cultural Comparison of Practices Relating to Widowhood and Widow-Inheritance among the Igbo and Yoruba in Nigeria, *Journal of World Anthropology: Occasional Papers: Volume III, Number 1*, p5373
- Fatiregun AA, Olowookere SA, Gbolahan OO, Adepoju EG. 2014. Diagnostic proficiency and reporting of Lassa fever by Nigerian physicians in Osun state of Nigeria. *BMC Infect. Dis*. 14:344
- Feldman H, Geisbert T.W. 2011. Ebola haemorrhagic fever. *Lancet*. 377: 849-862
- Formenty P, Hatz C, Guenno B.L, Stoll A, Rogenmose P, Widmer A. 1999. Human Infection to Ebola virus, subtype Cote d'Ivoire: Clinical and Biological presentation. *J. Infect. Dis*. 179(Suppl 1): S48.53.
- Francesconi P, Yoti Z, Declich S, Onok P.A, Fabiani M, Joseph O, et al. November, 2003. Ebola Hemorrhagic fever transmission and risk factors of contacts, Uganda. 9(11)

Available at: DOI: 10.3201/eid0911.030339

- Garner JS (1996) Guideline for isolation precautions in hospitals. The Hospital Infection Control Practices Advisory Committee. *Infect. Control Hosp. Epidemiol.* 17: 53-80.
- Geisbert T.W, Dadario-Dicaprio K.M, Lewis M.G, Geisbert J.B, Grolla A, Leung A, Paraga J, Matthias L, Smith M.A, Jones S.M, Hesley L.E, Feldmann H, Jahrling PB. 2008. Vesicular stomatitis virus-based Ebola vaccine is well-tolerated and protects immunocompromised non-human primates. *PLoS Pathogens* 4 (11): e1000225.
- Hewlett BS, Amola RP. Cultural contexts of Ebola in Northern Uganda. 2003. *Emerg Infect Dis*, 9/10:1242–1248.
<http://accessmedicine.mhmedical.com/content.aspx?bookid=331&Sectionid=40726956>.
- Jahrling J.B, Swearingen J.R, Larsen T, Geisbert T.W. 2007 Ebola Hemorrhagic Fever: Evaluation of Passive Immunotherapy in Nonhuman Primates. *J. Infect. Dis.* 196(Suppl 26): S400-S403.
- Kunii O, Kita E, Shibuya K. 2001. Epidemics and cultural factors of Ebola hemorrhagic fever in Gabon. *Nihon. Koshu. Eisei. Zasshi.* 48(10):853-859.
- Lagos state Bureau statistics. 2012. Abstract of Local government statistics. Ministry of Economic planning and Budget. Pp1-183
- Lamunu M, Lutwama J.J, Kamugisha J, Opio A, Namboozee J, Ndayimirije N, Okware S. March, 2002. Containing Hemorrhagic fever Epidemic, The Ebola Experience in Uganda (October 2000- January 2001). A paper presented at the 10th international congress on infectious disease, Singapore. pp 1-20
- Leach M. 2008. Hemorrhagic fevers in Africa: Narratives, politics and pathways of Disease and Response, STEPS working paper 14, Brighton: STEPS Centre.
- Leroy E.M, Baize S, Gonzalez J.P. 2011 Ebola and Marburg hemorrhagic fever viruses: update on filo viruses. *Med. Trop.* 71(2):111-121.
- Leroy E.M, Kumulungui B, Pourrut X, Rouquet P, Hassanin A, Yaba P, Délicat A, Paweska J.T, Gonzalez J.P, Swanepoel R. 2005. Fruit bats as reservoirs of Ebola virus. *Nature.* 1;438(7068):575-6
- Leroy E.M, Telfer P, Kumulungui B, Yaba P, Rouquet P, Roques P, Gonzalez J.P, Ksiazek T.G, Rollin P.E, Nerrienet E. 2004. A serological survey of Ebola virus infection in Central African non-human primates. *Infect. Dis. Soc. America.* 190: 1895-9.

- Gamer JS (1996) Guideline for isolation precautions in hospitals. The Hospital Infection Control Practices Advisory Committee. *Infect. Control Hosp. Epidemiol.* 17: 53-80.
- Geisbert T.W, Dadario-Dicaprio K.M, Lewis M.G, Geisbert J.B, Grolla A, Leung A, Paraga J, Matthias L, Smith M.A, Jones S.M, Hesley L.E, Feldmann H, Jahrling PB. 2008. Vesicular stomatitis virus-based Ebola vaccine is well-tolerated and protects immunocompromised non-human primates. *PLoS Pathogens* 4 (11): e1000225.
- Hewlett BS, Amola RP. Cultural contexts of Ebola in Northern Uganda. 2003. *Emerg Infect Dis*, 9/10:1242–1248.
<http://accessmedicine.mhmedical.com/content.aspx?bookid=331&Sectionid=40726956>.
- Jahrling J.B, Swearingen J.R, Larsen T, Geisbert T.W. 2007 Ebola Hemorrhagic Fever: Evaluation of Passive Immunotherapy in Nonhuman Primates. *J. Infect. Dis.* 196(Suppl 26): S400-S403.
- Kunii O, Kita E, Shibuya K. 2001. Epidemics and cultural factors of Ebola hemorrhagic fever in Gabon. *Nihon. Koshu. Eisei. Zasshi.* 48(10):853-859.
- Lagos state Bureau statistics. 2012. Abstract of Local government statistics. Ministry of Economic planning and Budget. Pp1-183
- Lamunu M, Lutwama J.J, Kamugisha J, Opio A, Nambooze J, Ndayimirije N, Okware S. March, 2002. Containing Hemorrhagic fever Epidemic, The Ebola Experience in Uganda (October 2000- January 2001). A paper presented at the 10th international congress on infectious disease, Singapore. pp 1-20
- Leach M. 2008. Hemorrhagic fevers in Africa: Narratives, politics and pathways of Disease and Response, STEPS working paper 14, Brighton: STEPS Centre.
- Leroy E.M, Baize S, Gonzalez J.P. 2011 Ebola and Marburg hemorrhagic fever viruses: update on filo viruses. *Med. Trop.* 71(2):111-121.
- Leroy E.M, Kumulungui B, Pourrut X, Rouquet P, Hassanin A, Yaba P, Délicat A, Paweska J.T, Gonzalez J.P, Swanepoel R. 2005. Fruit bats as reservoirs of Ebola virus. *Nature.* 438(7068):575-6
- Leroy E.M, Telfer P, Kumulungui B, Yaba P, Rouquet P, Roques P, Gonzalez J.P, Ksiazek T.G, Rollin P.E, Nerrienet E. 2004. A serological survey of Ebola virus infection in Central African non-human primates. *Infect. Dis. Soc. America.* 190: 1895-9.

- MacArthur L, Pena M, Holbert D. 2001. Effects of socioeconomic status on the obesity knowledge of adolescents from six Latin American cities. *Int. J. Obes. Relat. Metab. Discord.* 25:1262-1268.
- Macneil A, Rollin P.E. 2012. Ebola and Marburg Hemorrhagic Fevers: Neglected Tropical Diseases? *PLoS. Negl. Trop. Dis* 6(6):e1546.
doi:10.1371/journal.pntd.0001546
- Mahanty S, Bray M. 2004. Pathogenesis of Filo viral hemorrhagic fevers. *Lancet. Infect. Dis.* 4: 487-498
- Mandell G.L, Douglas G.R, Bennet J.E. 1979. *Principles and Infectious Practice of Infectious Diseases.* Wiley Medical Publication. Chapter 105. pp1229-1238
- Martinez. L (2002). Global Infectious disease surveillance. *Int. J. Infectious. Dis* 4(4): 222-28
- McElory A.K, Erickson B.R, Flietstra T.D, Rollin P.E, Nichol S.T, Towner J.S, Spiropoulou C.F. 2014. Biomarker correlates of survival in pediatric patients with Ebola Virus Disease. *Emerg. Infect. Dis.* 20(10): 1683-1690.
- Miranda M.G.E, Miranda N.L.J. 2011. *Reston Ebolavirus* in Humans and Animals in the Philippines: A Review. *J. Inf. Dis.* 204 (Suppl 3): S757-S760
- Mubonye A, Wamala J, Tugumizemo V, Aceng J, Makumbi I. 2012. Repeated outbreaks of Viral Hemorrhagic fevers in Uganda. *Afric. Hlth. Sci.* 12(4):579-583.
- Mupapa .K, Massamba M, Kibadi K, Kuvula K, Bwaka A, Kipasa M, et al. 1999. Treatment of Ebola Hemorrhagic fever with blood transfusions from convalescent patients. *J. Infect. Dis* 179(Suppl1):S18-23.
- Mupapa K, Muhunu W, Bwaka M.A, KipasM, Roo A.D, Kuvula K, Kibadi K, et al. 1999. Ebola Hemorrhagic fever and pregnancy. *J. Infect. Dis.* 179(1): S11-12
- Mupere E, Kaducu OF, Yoti Z. 2001. Ebola hemorrhagic fever among hospitalized children and adolescents in northern Uganda: epidemiologic and clinical observations. *Afr. Health Sci.* 1(2): 60-65.
- Mwanatambwa M, Yamada N, Arai S, Asano G, Shimizu-Suganumu M, Shchinohe K. 2001. Ebola Hemorrhagic Fever (EHF): Mechanism of transmission and pathogenecity. *J. Nippon. Med. Sch.* 68(5):370- 375

National Population Commission. 2006. Priority table Volume III. Population distribution by sex, state, LGA, and senatorial district. 2006 population and housing census. April, 2010 Vol 3:pp1-64

Nzewi D. (1981). "Widowhood Practices: A Female Perspective" paper presented at a workshop on widowhood practices in Imo State, June 6-7, 1989

Nigerian Federal Ministry of Health. 2014. Ebola Viral Disease. Fact sheet

Nigerian Federal Ministry of Health. 2014. Ebola Virus Information Unit.

Available at: <http://health.gov.ng/ebolainfo/>

Nigerian Federal Ministry of Health. 2014. Ebola Virus Information Unit. Prevention.

Official website of FCTA, Area Councils Services Secretariat (ACSS)

Available at: www.fctacss.org.ng

Official website of the Abuja Municipal Area Council

Available at: www.amac.com.ng

Official website of the Federal Capital Territory Administration

Available at: www.fct.gov.ng/index.html

Okechukwu EF, Motshedisi C. 2012. Knowledge and practice of standard precautions in public health facilities in Abuja, Nigeria. *Int. J. Infect. Control.* 8: i3

Peters C.J, Leduc J.W. 1999. An introduction to Ebola: The virus and the Disease. *J. Infect. Dis.* 179(Suppl 1):9-16

Peters C.J. 2012. Chapter 197. Ebola and Marburg Viruses. In Longo D.L., Fauci A.S., Kasper D.L., Hauser S.L., Jameson J, Loscalzo J (Eds), *Harrison's Principles of Internal Medicine*, 18e. New York, NY: McGraw-Hill; 2012 .

Pourrut X, Kumulungui B, Wittmann T, Moussavou G, Delicat A, Yaba P et al. 2005. The natural history of Ebola virus in Africa. *Microbes and Infection.* 7:1005-1014

Raabe VN, Mutyaba I, Roddy P, Lutwama JJ, Geissler W, Borchert M. 2010. Infection control during filoviral hemorrhagic fever outbreaks: preferences of community members and health workers in Masindi, Uganda. *Trans.R.Soc.Trop-Med.Hyg.* 104(1):48-50.

Retrieved September 29, 2014 from

Sanchez A, Ksiazek T.G, Rollin P.E, Miranda M.E.G, Trappier S.G, Khan A.S, Peters C.J,

Nichol S.T. 1999. Detection and molecular characterization of Ebola viruses causing disease in Human and Nonhuman Primates. *J.Infect. Dis* 179(1):S164-169.

- Sullivan N, Yang Z, Nabel G.J. 2003. Ebola virus pathogenesis: Implications for vaccines and therapies. *J. Virol* 77(18): 9733
DOI: 10.1128/JVI.77.18.9733-9737.2003.
- Tambo E, Ugwu E.C, Ngogang J.Y.2014. Need of surveillance response systems to combat Ebola outbreaks and other emerging infectious diseases in African countries. *Infect. Dis. Poverty*.3(29)1-13.
- Tabatabaei MS, Hassanzehi A, Pakzad A, Mohammadi M, Madani A. 2014. Factors influencing Crimean-Congo Hemorrhagic fever risk perceptions in the general population, Southeast Iran. *Int. J. Infect* 1(1): e18150
- Tobin EA, Asogun DA, Isah EC, Ugege OG, Ebdhodaghe P. 2013. Assessment of knowledge and attitude towards Lassa fever among primary care providers in an endemic suburban community of Edo state: Implications for control *J. Med. Med. Sci.* 4(8):311-318
- Tobin E.A, Asogun D, Happi C, Ogbaini E, Gunther S. April 2-5, 2014. Risk factors for Lassa fever in endemic communities of Edo state. Abstract presentation. International congress on infectious disease
- United Nations Children's Educational Fund (UNICEF), Catholic Relief Services, Focus 1000. September, 2014. Study on public knowledge, attitudes and practices relating to Ebola Virus Disease (EVD) Prevention and medical care in Sierra Leone. Pp1-33
- Ustun C. Ozgurler O. 2004. Ebola: A significant threat as an infectious disease and as a potential bioterrorism agent. *Turk. J. Med. Sci.* 35: 1-4.
- Warfield K.L, Swenson D.L, Olinger G.G, Kalina W.V, Aman M.J, Bavari S. 2007. Ebola virus-like particle-based vaccine protects nonhuman primates against lethal ebola virus challenge. *J. Infect. Dis.* 196: S430-S437.
- World Health Organization/UNAIDS.2000.Guidelines for measuring national HIV prevalence in population based surveys. UNAID/WHO working group on Global HIV/AIDS and STI surveillance. Pp 1-70
- World Health Organization. 2014. Ebola virus in semen of men who have recovered from Ebola Virus disease. <http://www.who.int/reproductivehealth/topics/rtis/ebola-virus-semen/en>.

- World Health Organization (WHO). 2008. Interim control recommendations for care of patients with suspected or confirmed filovirus (Ebola, Marburg) Hemorrhagic fever. BDP/EPR/WHO, Geneva March 2008. Pp 1-7
- World Health Organization (2014) Case definition recommendations for Ebola or Marburg virus diseases.
- World Health Organization (WHO). 2014. Ebola Response Roadmap Update. 17 October 2014. Retrieved 26 June 2014.
- World Health Organization (WHO). 2014. Sierra Leone: a traditional healer and a funeral. Global Alert and Response (GAR). Retrieved 6th October 2014.
- World Health Organization (WHO). 2014. Statement on the WHO consultation on potential Ebola therapies and vaccines. 5 September 2014. Retrieved on 1st October, 2014.
- World Health Organization. (WHO). 2014. Air travel is low-risk for Ebola transmission. August 2014.
- World Health Organization. (WHO). 2014. Safe Burial Practices. Information Resources on Ebola Viral Disease. 1 June, 2014.
- World Health Organization. 3rd September 2014. Situation assessment. Ebola situation in Port Harcourt.
- World Health Organization. April 2014. Ebola virus Disease. Fact sheet no 103
- World Health Organization. Global Alert and Response (GAR). August 2014. Ebola Virus Disease update-West Africa.
- World Health Organization. 2014. Clinical Management of Patients with Viral Hemorrhagic Fever: A pocket guide for the frontline health worker.
- World Health Organization. 2014. Interim version 1.2. Ebola and Marburg virus disease epidemics: preparedness, alert, Control and Evaluation.
- Xu L, Sanchez A, Yang Z, Zaki S.R, Nabel E.G, Nichol S.T, Nabel G.J. 1998. Immunization for Ebola virus infection. Nature Medicine 4 (1): 37-42.

Yang Z, Sullivan J.N, Duckers H.J, Sanchez A, Nabel G.E, Nabel G.J. 2000. Identification of the Ebola virus glycoprotein as the main viral determinant of vascular cell toxicity and injury. *Nature Med.* 8(6):886-889

Yilmaz R, Ozcetin M, Erkorkmaz U, Ozer S, Ekici F. 2009. Public knowledge and attitude towards Crimean Congo Hemorrhagic fevers in Tokat Turkey. *Iranian J. Arthropod-Borne Dis.* 3(2): 12-17.

Zaki S.R, Shich W, Greer P.W, Goldsmith C.S, Ferebee T, Katshitshi J et al. 1999. A novel immunohistochemical Assay for the diagnosis, spread and surveillance of Ebola Hemorrhagic fever. *J. Infect. Dis.* 179(Suppl 1): S36- S47.

UNIVERSITY OF IBADAN LIBRARY

APPENDIX 1
QUESTIONNAIRE

**EBOLA VIRAL DISEASE RISK PERCEPTION AND COMPLIANCE WITH INFECTIOUS
DISEASE CONTROL PRACTICES AMONG MORTUARY ATTENDANTS AND HEALTH
WORKERS IN SOME SOUTH-WESTERN STATES IN NIGERIA**

Dear Respondent,

I am a postgraduate research student of the department of Epidemiology and Medical Statistics of the Faculty of Public Health, UCH, University of Ibadan. I am conducting a research which focuses on "Knowledge of Ebola Viral Disease and infectious disease control practices among mortuary attendants and embalmers in some South-western states in Nigeria ". This survey is to assess mortuary attendants' knowledge, perception and practice on Ebola prevention and compliance to infectious control practices. This is a self-funded MSc research project, therefore I seek your objective contribution and truthfulness in filling out this questionnaire. Your response will be strictly for academic purpose only and will be treated with utmost confidentiality such that no part of it will be disclosed to anyone outside the confines of this study. The questionnaires will carry no names or identifiers, just serial numbers for data processing only.

You may wish to withdraw from the study at any given time you choose, nevertheless your cooperation in this study will be highly appreciated. Thank you for your cooperation.

Consent: Now that the study has been explained to me, and I fully understand the study procedure. I am willing to take part in the research.

Signature/thumbprint of participant

Date of interview

RESEARCHER: ADAMU HELEN NGODOO

ADDRESS: Department of epidemiology and medical statistics,
Faculty of public health, College of Medicine (UCH)
Ibadan.

PHONE NUMBER: 08034981589

Email address: adamuhelen66@gmail.com

Date: _____

Serial Number _____

SECTION A. Socio-demographics

Instruction: Please answer the following question by ticking (✓) the appropriate response

1. **Gender:** 1. Male [] 2. Female []
2. **Marital Status:** 1. Single [] 2. Married [] 3. Separated [] 4. Divorced []
5. Others please specify _____
3. **Religion:** 1. Islam [] 2. Christian [] 3. Traditional [] 4. Other(s) specify _____
4. **Ethnic Group:** 1. Yoruba [] 2. Ibo [] 3. Hausa [] 4. Other(s) specify _____
5. **Age as at last birthday:** _____
6. **Occupation:** 1. Mortuary attendant [] 2. Embalmer []
7. **Highest level of education:** 1. No formal education [] 2. Primary []
3. Secondary [] 4. Intermediate or higher secondary [] 4. College or
university [] 5. Postgraduate and above []
8. **Years of work experience** _____
9. **Type of facility** 1. Tertiary health facility [] 2. Secondary health facility [] 3. Private
hospital [] 3. Private funeral homes []
10. **Your duties include the following:**
 1. Housekeeping duties e.g cleaning and disinfection of morgue and autopsy room []
 2. Clerical duties (admits and discharge bodies from the morgue []
 3. Assist pathologist in autopsy procedure, sealing and labeling tissues, sewing cavities and aspirating fluids []
 4. Disposal of body parts and materials (soiled cloths) []
 5. Prepare bodies by washing, cleaning and embalming []

SECTION B. AWARENESS AND KNOWLEDGE OF EBOLA VIRAL DISEASE

11. Have you ever heard of Ebola? 1. Yes [] 2. No []

12. If yes, how did you get to hear about Ebola (the first time)?

1. Friends/relatives [] 2. Hospital/health facilities [] 3. Media e.g
Television, Radio, Newspaper, Magazine, Internet [] 4. Church, mosque or any
other religious organization [] 5. Others specify _____

Respondent, kindly tick (✓) the appropriate answers to the following questions.

13. Which of the following causes Ebola

- a. Bacteria b. Virus c. Parasite d. Spirit e. don't know

14. The symptom(s) of Ebola include

- a. Bleeding from the gum b. Persistent fever c. bleeding from the nose d.
stomach ache e. don't know

15. Which of the following can transmit Ebola

- a. Eating bush meat b. Washing Ebola infected corpse c. Air d. bats
e. don't know

16. Ebola can be controlled by

- a. Building a separate latrine for sick individual b. washing hands before contact with
corpse. c. Embalming EVD infected corpse e. burning mattress used by Ebola
infected individual f. Isolating sick individual

17. Ebola can be treated by the following

- a. Traditional healer/ herbalist b. spiritual healer c. Doctor d. Do not know

18. Ebola can be prevented through the following

- a. Bathing with salt water frequently b. Eating bitter kolanut
frequently d. drinking salt water e. Do not know c. Washing hands

SECTION C. ATTITUDE TO EVD CASES

Respondent, kindly tick (✓) the appropriate answers to the following questions.

	Statement	Agree	Disagree	Undecided
19	Suspected persons should be taken to traditional homes			
20	I will not share food and drink with an individual recovering from Ebola Viral Disease			
21	I can attend social functions/community meetings with an individual who has recovered from Ebola Viral Disease.			
22	I will welcome a neighbor recovering from Ebola back into the community			
23	I believe the publicity given to Ebola is unnecessary			
24	EVD is a punishment from God			
25	I will keep the information secret if a family member contracts Ebola			

SECTION D. ATTITUDE TO PPE USE

PPE's are personnel protective equipment worn to protect workers from contagious diseases and includes gloves, bootis, nose mask, apron, face shield, eye google etc

Respondent, kindly tick (✓) the appropriate answers to the following questions.

26. Do you wear PPE's when handling corpse? a. Yes b. No (If No, skip to Q28)

27. If yes, how frequent do you use it when in contact with corpse? a. Always b. sometimes

If No, please tick the appropriate reasons (You can have multiple reasons)

28. I do not wear PPE's because

- a. There is no penalty if not wearing [T/F]
- b. I have not been infected with any hospital related illness [T/F]
- c. There are limited number of PPE's in our facility [T/F]

- d. My colleagues do not wear them [T/F]
- e. It slows down my work [T/F]
- f. There is too much work to be done in my work place [T/F]
- g. I do not care to [T/F]
- h. It is unnecessary [T/F]

SECTION D. ADHERENCE TO INFECTIOUS DISEASE CONTROL PRACTICES

Respondent, kindly tick (✓) the appropriate answers to the following questions.

	Statement	Always	Sometimes	Never
29	I use disinfectants after cleaning floors contaminated with blood, and other body fluids			
30	I wash my hands with soap and water after contact with deceased body			
31	I use face shields in postmortem procedures likely to produce splashes.			
32	I wear nose masks during embalming procedures			
33	I wear Aprons when handling corpse			
34	I repeat using disposable gloves.			
35	I wash hands after contact with contaminated equipment or surfaces			
36	I remove soiled/wet gown as soon as possible			

SECTION D: RISK PERCEPTION

Give your opinion about these statements by ticking (✓) appropriately your response

37. If you were to contract Ebola, how serious do you think the consequences would be?

- A. Not serious b. somewhat serious c. Serious d. very serious e. undecided

38. In your opinion, how likely is it for you to contract a viral infectious disease

- a. very unlikely b unlikely c. likely d. very unlikely e. undecided

39. Do you worry about or feel fearful of EVD

- a. not at all b. rarely c. from time to time d. a great deal e. undecided

40. Ebola is a fatal disease

- a. strongly agree b. agree d. disagree e strongly disagree e. undecided

41. Do you agree that your job put you at risk of contracting Ebola

- a. strongly agree b. agree d. disagree e strongly disagree e. undecided

42. How confident are you in your ability to avoid contracting any viral infectious disease from your job

- a. Not sure b. somewhat sure c. Sure d. very sure e. Undecided

43. Do you agree that a corpse that died due to Ebola is no longer contagious to workers

- a. strongly agree b. agree d. disagree e strongly disagree e. undecided

UNIVERSITY OF IBADAN LIBRARY

APPENDIX 2

EBOLA VIRAL DISEASE RISK PERCEPTION AND COMPLIANCE WITH INFECTIOUS DISEASE CONTROL PRACTICES AMONG MORTUARY ATTENDANTS AND EMBALMERS IN SOME SOUTH- WESTERN STATES IN NIGERIA

FOCUS GROUP DISCUSSION GUIDE

Introduction

Good day to you all. My name is.....from the department of Epidemiology and Medical Statistics, university of Ibadan. My colleagues are.....In this discussion, we want you to share with us your opinion, beliefs or perceptions concerning Ebola viral disease, traditional rites, infection control measures and some health problems in this community. We appeal to you to feel relaxed and be open during the discussion. We assure you that all our discussions will be kept confidential and will not be shared with any persons. Thank you for your patience.

1. Please share your experiences and say exactly what you think. Don't worry about what your neighbour thinks or say. We are not interested in who is right or wrong.
2. Share your views without mentioning people's name.
3. Express your opinions, but do not insist on whether what you say is the most common or the only correct thing.
4. This discussion will be tape recorded; so please speak up and speak clearly. Do not mention fellow discussants' name so that the tape will not pick it up. We want the discussion to be anonymous and confidential as possible.
5. Only one person is allowed to talk at a time, please let us take turn to speak. Each person should be allowed to take

Thanks once again for coming to participate in this study.

S/N	Main question	Follow up question/ probe
1.	(a). How is life generally in Ibadan these days? (b). What are the major health related problems that people face occasionally in Oyo state?	

5	If someone recovered from the disease in your community, how will you relate with him or her?	<p>Probe for:</p> <p>Attending social functions, sharing food and drink, trading with Ebola recovered individual</p>
6	How do you feel (opinion) about Ebola disease?	<p>Probe for:</p> <ul style="list-style-type: none"> • Is Ebola a fatal disease? • Are you fearful about the disease or do you worry about it? • Do you think your work exposes you to infectious disease? • Are you confident in your ability to protect yourself against contracting any infectious disease?
7	What are the practices that can promote the spread of Ebola disease?	<ul style="list-style-type: none"> • Probe into practices such as: <ul style="list-style-type: none"> (a). hawking fruits e.g pineapple, peeled and unpeeled pawpaw, washing before eating (b). Bathing frequently with salted water (c). Eating bush meat (d). Other foods not cooked properly before eating.

5	If someone recovered from the disease in your community, how will you relate with him or her?	<p>Probe for:</p> <p>Attending social functions, sharing food and drink, trading with Ebola recovered individual</p>
6	How do you feel (opinion) about Ebola disease?	<p>Probe for:</p> <ul style="list-style-type: none"> • Is Ebola a fatal disease? • Are you fearful about the disease or do you worry about it? • Do you think your work exposes you to infectious disease? • Are you confident in your ability to protect yourself against contracting any infectious disease?
7	What are the practices that can promote the spread of Ebola disease?	<ul style="list-style-type: none"> • Probe into practices such as: <ul style="list-style-type: none"> (a). hawking fruits e.g pineapple, peeled and unpeeled pawpaw, washing before eating (b). Bathing frequently with salted water (c). Eating bush meat (d). Other foods not cooked properly before eating.

8	<p>(b). <i>In some places in Yoruba land, sometimes widows are forced to drink the water used to bath their dead husband as proof of non-involvement in their husbands death</i></p> <ul style="list-style-type: none"> • How common is the practice in this community. 	<p>Probe for the following:</p> <ul style="list-style-type: none"> • The disease which the practice can lead to. (Ask for Ebola if not mentioned by participants). • Traditional practices like hugging and touching the dead
9.	<p>What are the places where Ebola can be diagnosed and treated in this area?</p>	<ul style="list-style-type: none"> • Probe for the name of the centres

Thank you all for taking time out of your crowded schedule to come and share your experiences with me.

UNIVERSITY OF IBADAN LIBRARY

IWE IBEERE

ERO NIPA EWU TOROMO AISAN KOKORO EBOLA ATI SISE AMULO AWON ORISIRISI ONA IDENA SI TITANKALE AJAKALE AISAN YI LAARIN AWON OSISE ILE-IGBOKUPAMO PELU AWON OSISE ILETO ILERA NI AWON IPINLE KAN NI GUUSU IWO-OORUN NI ORILE EDE NIGERIA

Oludasimi tooto,

Moje akeko oluwadi lati eka Ajakale-aisan ati Igbelewon Ilera ni Ilera gbogbo-ilu ti Iwadi isegun ni Fasiti Ilu Ibadan. Mo nse iwadi lori “**Imo lori kokoro aisan Ebola ati awon idena si itankale re laarin awon osise agbokupamo ati awon asokulojo ni awon Ipinle kan ni Guusu Iwo-oorun ni Nigeria**”. Iwadi yi je lati mo nipa Imo, Ero ati Isesi awon osise ile igbokupamo lori idena ati sise amulo awon orisirisi ona idena si titankale ajakale aisan yi. Iwadi yi sije fifi owo ara mi se, si eyi mosife idahun yin ni taara ati otito si didahun awon ibeere wonyi, ti awon idahun naa yio si wulo fun eko nika ti won o si wa ni ipamo. Ki esimo dajupe ki emaseko oruko abi awon ohun idanimomo yin sori iwe ibeere yi.

Ki esimodajupe ti obawuyin e le gbimoran lati makopamo nigba ti oba wuyin, sibesibe, ajosepo yin lori iwadi yi yio je inu didun mi. Modupepupo fun ifowosowopo yin.

Igbayonda: Bayi ti mo ti salaye ohun gbogbo funyin lori iwadi yi, ti osiyemi yekeyeke, osiwumi lati kopa lori iwadi yi.

Ibuwolu/Iteka oludasi

Ojo iwadi

OLUSEWADI: ADAMU HELEN NGODOO

ADIRESI: Eka Ajakale-aisan ati Igbelewon Ilera ni Ilera gbogbo-ilu ti Iwadi isegun ni Fasiti Ilu Ibadan.

NOOBA IPE: 08034981589

ADIRESI AYELUKARA: adamuhellen66gmail.com

IWE IBEERE

ERO NIPA EWU TOROMO AISAN KOKORO EBOLA ATI SISE AMULO AWON ORISIRISI ONA IDENA SI TITANKALE AJAKALE AISAN YI LAARIN AWON OSISE ILE-IGBOKUPAMO PELU AWON OSISE ILETO ILERA NI AWON IPINLE KAN NI GUUSU IWO-OORUN NI ORILE EDE NIGERIA

Olukopami tooto,

Moje akeko oluwadi lati eka Ajakale-aisan ati Igbelewon Ilera ni Ilera gbogbo-ilu ti Iwadi isegun ni ni Orita-mefa ti Fasiti Ilu Ibadan. Mo nse iwadi lori "Ewu toromoaisan kokoro Ebola ati awon idena si itankale re laarin awon osise agbokupamo ati awon asokulojo ni ipinle Eko ati Ibadan. Mosifefi dayinlojupe awon idahun yin yo si wulo fun eko nika ti won o si wa ni ipamo. Ki esimo dajupe ki emaseko oruko abi awon ohun idanimo yin sori iwe ibeere yi.

Modupe fun ifowosowopo yin>

Mofaramo lati kopa

Nooba Idamo Iwe.....

EKA A: AWON OHUN IDAMO OLUDAHUN

Akiyesi: Jowo maaki (✓) idahun eyi to ba ba okokan ibeere iho nisale yi mun

1. Eda wo ni yin? a. Okunrin b. Obinrin
2. Kinni ipo iloko/laya yin? a. Nkotiloko b. Tiloko d. Tipinya e. Tituka
e. Omiran (se alaye)?.....
3. Esin wo ni esin ti e nsin? a. Musulumi b. Igbagbo d. Esin abalaye
e. Omiran (se alaye)?.....
4. Eya wo niyin? a. Yoruba b. Igbo d. Hausa e. Omiran (se alaye).....
5. Omo odun melo niyin ni ojo ibi yin tokoja?.....
6. Ise wo ni ise yin? a. Osise ile-igbokusi b. Olusokulojo
7. Ile iwe wo ni elo? a. Nkolo ile-iwe b. Ile alakobere c. Ile-iwe girama
e. Ile-iwe giga ju ti girama lo e. Molo Ile iwe Olukoni agba abi Unifasiti
f. Ile-iwe Igboye giga keji
8. Iye odun ti eti nsise?.....

9. Iru ipo ile itoju oku yin? a. Onipo-keta b. Onipo-keji d. Ile-iwosan aladani
e. Ile-itojuoku aladani

10. Ise yin jemo awon wonyi?

a. Ise titun-ilese apere fifo-ile ati fifi oun apa-kokoro si yaara-isokolojosi ati yara-isayewo fun oku

b. Ise tojemo akowe (igba-oku wole ati yiyonda oku lati yaara-isokulojosi)

d. Riran awon asayewo oku lowo, sisami si oun ayewo lara oku, reran ara-okun ati ninu omi tounjade

e. Dida awon eya ara ati awon oun elo oku bi aso danu

e. Wiwe awon oku, ninu-okun lara ati sisokulojo

EKA B: IPOLONGO ATI IMO LORI KOKO ARUN EBOLA

11. Nje etigbo nipa arun Ebola ri? a. Beeni b. Beeko

12. Tobaje beeni, bawo ni esegbo nipa Ebola (lakoko)?

a. Awon-ore/alabagbe b. Awon ile-iwosan/itoju d. Ipolongo bi Mowomaworan, Redio, Iwe-iroyin, Iwe-igbadegba, Ayelukara

e. Omiran se alaye.....

Olukopa, jowo maaki (✓) idahun eyi to ba ba okokan ibeere isale yi mun (ole ju idahun kan lo)

13. Ewo ninu awon wonyi ni oma nfa ebola? a. Kokoro-bacteria b. Kokoro-virus

d. Kokoro-tomanfa aisan e. Emi-airi/kemi

14. Awon afihan Ebola ni? a. Eje dida lati enu b. Iba gbogbo igba d. Eje dida lati imu

e. Inu rerun e. Omiran se alaye.....

15. Iruwo ninu awon wonyi ni o le ko Ebola ran eniyan? a. Efan b. Jije eran-igbe

d. Wiwe oku enitoku ni aisan Ebola e. Afefe e. Omiran se alaye.....

16. Ebola le se dena nipa? a. Kiko ile-igbonse miran fun alaisan b. Fifowo leyin fifowo kan oku ise oku eni tobani aisan Ebola lojo Sisun ibusun eni toni Ebola ni ina

17. Won le sewosan/toju eni toni Ebola lati owo? a. Jawe-wagbo/Baba-lawo

b. Oluwo emikemi d. Dokita e. Nkomo

18. Ebola le se dena nipa awon wonyi? a. Fifi omi toni iyo we dede b. Jije orogbo

d. Fifo owo dede Mimun omi-iyo

EKA D: ISESI SI AWON KOKORO AISAN EBOLA

Olukopa, jowo maaki (✓) idahun eyi to ba ba okokan ibeere isale yi mun (ole ju idahun kan lo)

	Gbolohun	Mofaramo	Nkofaramo	Nkoleso
19	Iru awon eniyan ti aba keefin ye kakowonlo awon <input type="checkbox"/> iwosan ibile			
20	Nkonileba iru alaisan to sese ngbadun ninu aisan Ebola je ounje abi mun nkan			
21	Mole lasi ibi awon inawo/ipade pelu eniyan to sese wosan lati aisan Ebola			
22	Mo le gba alabagbe mi to sese ngbadun ninu aisan Ebola pada si agbegbe mi			
23	Mogbagbo pe gbogbo ipolongo/ifitonileti tiwon se fun Ebola koye rara			
24	Aisan Ebola je ifiyajeni lati odo Olorun			
25	Nkoniso fun enikankan ti enikenin ninu ebi mi bako aisan Ebola			

EKA D: IWUWASI SI LILO NKAN LILO ISISE IDAABOBO

Nkan lilo isise idaabobo lowo arunni awon oun elo ti awon osise ma nlo ti wonba nsise lati da abo bowon lati mako arun/aisan toromo ise ti wonse, apeere ibowo, bata-aabo, ibo-imu, aso-abo, ibo-oju, ati bebe lo.

Olukopa, jowo maaki (✓) idahun eyi to ba ba okokan ibeere isale yi mun

26. Nje e ma nlo nkan lilo isise idaabobo lowo arun ti awon osise ba nsise won?

- a. Beenii b. Beeko

Tobaje beeko, lo si ibeere 28 (Q28)

27. Tobaje beeni, nje e ma nlo deede bi ti e ba ntoju oku?

- a. Nigbagbogbo b. Awon igbakokan

Tobaje beeko, jowo maaki (✓) idahun eyi to ba ba okokan ibeere isale yi mun (ole ju idahun kan lo)

28. Nkilo oun isise idaabobo lowo arun fun idi wonyi

- a. Kosi ibawi ti nkobalo? a. Beenii b. Beeko

- b. Nko ti ni idojuko arun toromo ile-iwosan kankan ri? a. Beeni b. Beeko
- d. Amoye oun isise idaabobo lowo arun ni ile-ise wa? a. Beeni b. Beeko
- e. Awon egbemi yoku kiwo won? a. Beeni b. Beeko
- e. O ma nje ki eniyan lora ise ni sise? a. Beeni b. Beeko
- f. Ise po funwa latise ni ibi ise wa? a. Beeni b. Beeko
- g. Nkofe lo ni a. Beeni b. Beeko
- gb.Ko pondandan lati lo a. Beeni b. Beeko

EKA E: IFARAMO AWON ONA LATI DENA ARUN TITANKALE

Olukopa, jowo maaki (✓) idahun eyi to ba ba okokan ibeere isale yi mun

	Gbolohun	Nigbagbogbo	Awon igba kan	Kosigbakankan
29	Mo ma nlo oun apa-kokoro leyin ti nba nule ti eje ati awon omi ara oku ba da/ro si			
30	Mo ma nfo owo mi pelu ose ati omi leyin ti mo bafi owo mi kan oku			
31	Mo ma nlo ibo oju ti aba nse awon ayewo ntopa oku, toripe nkan bi omi le ta lati ara oku			
32	Mo ma nwo ibo-imu ti a ba nse imura lati se oku lojo			
33	Mo ma nwo awon aso ise ti a ba nse oku lojo			
34	Mo ma ntunlo ibowo timobatilo tele pada			
35	Mo ma nfo owo mi pelu ose ati omi leyin ti mo bafi owo mi mun irin-ise			
36	Mo ma nbo aso to bati baje abi tutu logan			

EKA E: ERO TOROMO IJAMBA

So awon ero re lori awon oro yi nipa maaki (✓) idahun eyi to ba ba okokan ibeere isale yi mun

37. Tobajepe eko arun Ebola, bawo ni yio se le/ri lara yin?

- a. kole . yirole bakan . ole . ole-gan e. kolojuwon

38. Ni ero tie yin, bawo ni osese si ki ki e ko arun?

a. kofesese b. kosese osese osese-dada nkoleso

39. Nje e nberu abi o nmun eru wa nipa arun Ebola?

a. koribee rara koribee lati igba de igba erujeje/eru-nla ni nkoleso

40. Ebola je arun to ma npa eniyan?

a. figbogbo aramo faramo nkofaramo nkofaramo-rarai nkomo

41. Nje efaramo pe ise yin le mun kiko arun Ebola wa?

a. figbogbo aramo faramo nkofaramo nkofaramo-rarai nkomo

42. Bawo ni ose dayinloju si latimako arun kankan ninu ise ti ense?

a. nkonigbagbo igbagbo mi kere nonigbagbo igbagbo mi daju

e. nkomo

43. Nje afaramo pe oku ti obaku toni arun Ebola ko le ran awon onise ilera?

a. figbogbo aramo aramo kofaramo kofaramo-rarai nkomo

44. Nje elo si ile iwosan nigba ti eni aisan iba tole? a. Beeni b. Beeko

ATONA SI AJOGBIMOROPO

ERO NIPA EWU TOROMO AISAN KOKORO EBOLA ATI SISE AMULO AWON ORISIRISI ON A IDENA SI TITANKALE AJAKALE AISAN YI LAARIN AWON OSISE ILE-IGBOKUPAMO PELU AWON OSISE ILETO ILERA NI AWON IPINLE KAN NI GUUSU IWO-OORUN NI ORILE EDE NIGERIA

Ifaara,

Ekun ojumoni o, oruko mi ni..... lati eka Ajakale-aisan ati Igbelewon Ilera ni Ilera gbogbo-ilu ti Iwadi isegun ni Fasiti Ilu Ibadan. Awon yoku mi ni.....

lori ajogbimoranpo, afe ki esofunwa awon ero, igbagbo abi akiesi lori aisan kokoro Ebola, awon eto isinku, sise awon idena si titankale re ati awon ipenija si ilera ni agbegbe yi. Asigbayin ni iyanju pe ki eturaka si jijo gbogbimoranpo yi. Asife fidayinloju pea won ajosopo wa yio wa ni ipamo. Adupe fun suru yin.

1. Ejowo e so awon iriri yin funwa atipe ki e so ero yin gan. Esi maro onkohun ti ore yin le ro tabi so. Akonife mo boya iro yin to abi koto.
2. Eso awon ero yin laiso oruko enikankan.
3. Eso awon ero yin funwa sugbon ki ema ro boya idahun naa ni o ye ju abi bee gan ni oye ki idahun naa ri.
4. Ajogbimoranpo yio je kika sile ninu fanran, fundi eyi ki esoro soke geere. Emada oruko awon ti ajo nse asopo yoku ni omoba yo ninu faaran. Anfe ki ajosopo wa yi mafara pe ti enikankan ati pe kowa ni ikoko toba seese.
5. Eyo enikan ni afani wafun pe kosoro nigba ti obaye kan enikookokan lati soro .

Mo dupe lekansi fun wiwa lati kopa ninu iwadi yi.

S/N	Ibeere gan an	Ibeere latise ayewo/atise iwadi
1.	<p>(a). Bawo ni aye seri ni Ibadan ni lolo yi?</p> <p>(b). Kinni awon ipenija togaju ti onkoju ilera ti awon eniyan nkoju ni ipinle Oyo?</p>	
2.	<p>(a). Kinni nkan gan ti e nse?</p> <p>(b). Nje ilese yin ma nseto eko igbadegba lori bi esele ma toju oku bi?</p> <p>(d). Bawo lese ma ngba oku ti wonba gbewon wa?</p> <p>Akiesi: Awonisesi awon awon osise ile-igbokupamo ati sise amulo awon orisirisi ona idena si titankale ajakale aisan.</p>	<p>Isewadi si nkan wonyi:</p> <ul style="list-style-type: none"> • Kinni ajosepo ti eni pelu oku totiku? • Bi awon igbawo ni awon eniyan ma ngbe oku wa si odo yin? • Ni igbawo gan larin odun ti wonma ngbe oku wa sodo yin ju? <p>Isewadi si nkan wonyi:</p> <p>Lilo awon nkan lilo isise idaabobo lowo arun bi iboju, awo-oju, bata, aso-aabo ati beebe lo</p> <ul style="list-style-type: none"> • Nje ema nlo awon nkan lilo isise idaabobo lowo arunbi • Bawo ni ese ma nlowon? • Iruwo ninuwon ni elo ni ipe yi? • Awon igbawo ni ema nlowon? <p>Isewadi si:</p> <ul style="list-style-type: none"> • Sisesi won si eto owo fifo • Ounje jije ni ile-itojuo oku • Wiwo aso idaabobo ti wonba nse ayan itoju/ipamo oku?
3.	<p>Kinni awon igbagbo toromo si itoju oku/ isokulojo</p>	<p>Isewadi si:</p> <ul style="list-style-type: none"> • Bi wonse ma nse isinku • Ni iliana Musulumi/Kiristeni/Abalaye • Bawo ni wonse nse?

4.	Bayi e je ka soro lori aisan Ebola ni san	<p>Isewadi si awon wonyi:</p> <ul style="list-style-type: none"> • Okufa re • Ona itankale re • Itoju sise nipa lilo oogun ibile • Itoju sise nipa lilo oogun oyinbo • Awon amin/ifarahan lati da alaisan Ebola mo • Awon ona lati dena aisan Ebola
5.	Ti enikan ba wosan ninu aisan ni agbegbe yin, bawo ni ese ma nse si iru okunrin abi obinrin naa?	<p>Isewadi si:</p> <p>Lilo si awon ibi ti wontise inawo, jijo pin ounje ati nkan mun, jijosowopo pelu eni tosesesan ninu aisan Ebola.</p>
6.	Bawo ni ose ma nri ni ero yin si aisan ebola?	<p>Isewadi si:</p> <ul style="list-style-type: none"> • Nje Ebola je aisan nla bi? • Nje ema nberu aisan yi abi aisan naa ma nyayin ni enu? • Nje erope ise yin ma dojuyin ko arun kiko bi? • Nje eni idaniloju lati daabo bo arayin lati lati mako arun kankan bi?
7.	Kinni awon isesi tolefa itankale aisan Ebola?	<p>Isewadi siawon isesi bi:</p> <p>(a). Riraje awon eso bi Opin-eyinbo, Ibepe bibe abi tiwokobe tiwonfo kiwontoje.</p> <p>(b). Wiwe ninu omi toni iyo</p> <p>(d). Jije eran igbe</p> <p>(e). Awon ounje miran ti wonkose daradara ki wonto je.</p>
8.	(b). Ni awon ibikan ni ile Yoruba, awon opo binrin ma npani dandan fun lati mun omi ti wonfiwe oko won ti wokoba lowosi iku oko	<p>Isewadi siawon isesi bi:</p> <ul style="list-style-type: none"> • Aisan ti isesi naa le muwa. (Beere bi awon olukopa koba daruko Ebola).

	won ti oku <ul style="list-style-type: none"> • Bawo ni asa yi se wopo si ni agbegbe yi. 	<ul style="list-style-type: none"> • Awon isese bi didimora eni ati fifowo kan oku
9.	Awon ibiwo ni wonti le sayewo ati itoju fun Ebola ni agbegbe yi?	Isewadi siawon oruko ile-itoju bee.

Adupe fun asiko yin ti etifisile lati so awon ero yin funwa lori iwadi yi.

UNIVERSITY OF IBADAN LIBRARY



MINISTRY OF HEALTH
DEPARTMENT OF PLANNING, RESEARCH & STATISTICS DIVISION
PRIVATE MAIL BAG NO. 5027, OYO STATE OF NIGERIA

Your Ref. No.

All communications should be addressed to

the Honorable Commissioner quoting

Our Ref. No. AD 13/ 479/199

February, 2015

The Principal Investigator,
 Department of Epidemiology and Medical Statistics,
 Faculty of Public Health,
 College of Medicine,
 University of Ibadan,
 Ibadan.

Attention: Adamu Helen


Ethical Approval for the Implementation of your Research Proposal in Oyo State

This acknowledges the receipt of the corrected version of your Research Proposal titled: "Ebola Viral Disease Risk Perception and Compliance with Infectious Disease Control Practices among Mortuary Attendants and Embalmers in some South Western States in Nigeria."

2. The committee has noted your compliance with all the ethical concerns raised in the initial review of the proposal. In the light of this, I am pleased to convey to you the approval of committee for the implementation of the Research Proposal in Oyo State, Nigeria.

3. Please note that the committee will monitor closely and follow up the implementation of the research study. However, the Ministry of Health would like to have a copy of the results and conclusions of the findings as this will help in policy making in the health sector.

4. Wishing you all the best.


 Sola Akande (Dr)
 Director, Planning, Research & Statistics
 Secretary, Oyo State, Research Ethical Review Committee