

**EFFECTS OF BEHAVIOURALCHANGE COMMUNICATION ON CHILD
SURVIVAL PRACTICES AMONGMOTHERS OF UNDER-FIVE CHILDREN
INSELECTEDSOUTHWESTERN STATES, NIGERIA**

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CERTIFICATION

I certify that this research work titled “effects of behavioural change communication on child survival practices among mothers of under-five children in selected Southwesternstates, Nigeria”was carried out by Bukola Olanike Bamisayein the Department of Human Nutrition, Faculty of Public Health, College of Medicine, University of Ibadan under my supervision.

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ABSTRACT

Child Survival (CS) is an essential component of public health concerned with reducing child morbidity and mortality. Despite the availability of knowledge and technology for life-saving interventions, Nigeria ranks seventh highest in Under-5 Mortality Rate (U5MR) globally. Behavioural Change Communication (BCC) is useful in promoting positive health outcome through several models. However, its potential in promoting CS practices remains understudied. The study was conducted to evaluate the effects of BCC on CS practices among mothers of under-five children in selected Southwestern states, Nigeria.

Cluster randomized design involving a four-stage sampling technique was adopted. In Oyo, Ogun, and Ekiti States, two Local Government Areas (LGAs) per state and three communities per LGA were selected using simple random sampling technique. Households and mother-child pair were selected using a systematic sampling technique. A total of 1308 (Oyo-438, Ogun-444, and Ekiti-426) mother-child pairs were selected at baseline, from which 654 (218 per state) were randomly assigned to Experimental Group (EG) (327) and Control Group (CG) (327). Experimental group was exposed to six sessions of BCC and followed-up using interpersonal communication approach for six months. Pre-tested, interviewer-administered, semi-structured questionnaire containing 12-point knowledge and 13-point practice scales were used to assess mothers' knowledge and practices of CS. The CS components measured were newborn care, breastfeeding, and complementary feeding, micronutrient supplementation, immunisation, management of sick children and use of mosquito net. Dietary intake (24-hour recall) and Anthropometric parameters of children were analysed using total dietary assessment and WHO Anthro. Data were analysed using descriptive statistics, paired students' t-test and multiple regression models at $\alpha_{0.05}$.

Ages of mothers and children were 30.7 ± 6.1 years and 28.8 ± 14.8 months respectively. Majority of the mothers were Yoruba (89.8%), married (94.9%) and had secondary education (51.7%). The majority (69.1%) and 59.1% had no access to an improved toilet facility and refuse disposal methods, respectively. Overall, U5MR was 52 per 1,000 live births. Wasting, underweight, stunting, overweight and obesity

were: 4.8%, 8.4%, 18.3%, 12.3% and 13.5%, respectively. Mothers' knowledge of CS components significantly increased from 4.5 ± 3.0 at baseline to 10.2 ± 1.8 for EG and increased from 4.9 ± 2.1 to 5.3 ± 2.1 for CG. Mothers' practice of CS increased from 3.96 ± 2.13 at baseline to 12.9 ± 2.4 for EG and from 3.8 ± 2.1 to 3.9 ± 2.1 for CG. Adequate intake of energy, protein, carbohydrate, vitamin A, iron and calcium among children increased from 24.6%, 25.4%, 33.3%, 5.6%, 35.7% and 6.3% at baseline to 41.6%, 32.9%, 36.6%, 6.2%, 37.9% and 6.9% post-intervention, respectively. Wasting, underweight and stunting decreased in EG from 7.3%, 9.3% and 20.6% at baseline to 2.7%, 3.0% and 16.3% at post-intervention, respectively. The odds of CS is twice higher in literate than non-literate mothers (OR: 1.9; CI: 1.2-2.8), urban than rural dwellers (OR: 2.2; CI: 1.1-4.8).

Behavioural change communication improved mothers' child survival knowledge and practices and reduced child's under-nutrition. Its use is recommended for promoting child survival practices among mothers of under-five children.

Keywords: Child survival knowledge, Behavioural change communication, Inter-personal communication approach, Under-five mortality

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DEDICATION

This work is dedicated to God Almighty, who has been the initiator and has brought about the successful completion of it: He has always been there for me and with me; I say thank you to God, the all-sufficient one, my shield, protector, and helper, the Supreme in authority.

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LIST OF ACRONYMS

ARI	Acute Respiratory Infections
BCC	Behaviour change communication
BCG	Bacillus Calmette-Guérin
BMI	Body Mass Index
CDC	Centre for Disease Control and Prevention
CMR	Cumulative mortality rate
CS	Child Survival
CSS	Child Survival Strategies
DHS	Demographic and Health Survey
DPT	Diphtheria-Tetanus-Pertussis
EBF	Exclusive Breastfeeding
EDHS	Ethiopia Demographic and Health Survey
FCPs	Family and Community Practices
FFQ	Food Frequency Questionnaire
FGD	Focus Group Discussion
FMOH,	Federal Ministry of Health
GMP	Growth Monitoring and Promotion
HBM	The Health Belief Model
HH	Household
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome
ICCM	Integrated Community Case Management
IEC	Information, Education and Communication
IGF-1	Insulin-like Growth Factor 1
IMCI	Integrated Management of Childhood Illnesses
IPC	Interpersonal Communication
IPT	Intermittent Preventive Treatment
ITNs	Insecticide Treated Nets
IYCF	Infant and Young Child Feeding

LBW	Low Birth Weight
LGA	Local Government Areas
LLIN	Long Lasting Insecticide treated Net
MDG	Millennium Development Goals
MTCT	Mother-to-Child Transmission
MUAC	Mid Upper Arm Circumference
NDHS	Nigeria Demographic and Health Survey
NNHS	National Nutrition and Health Survey
NPC	National Population Commission
NRHM	National Rural Health Mission
ORT	Oral Rehydration Therapy
PCA	Principal Components Analysis
PMTCT	Prevention of Mother-To-Child Transmission
RDA	Recommended Daily Allowance
RDI	Recommended Daily Intake
SDG	Sustainable Development Goal
SES	Socioeconomic Status
SGD	Survival, Growth, And Development
SHS	Second-Hand Smoke
SIDS	Sudden Infant Death Syndrome
SMS	Short Message Service
SPSS	Statistical Package for Social Sciences
SSA	Sub-Saharan African
SSH	Sustainable Sanitation and Hygiene
TB	Tuberculosis
TDA	Total Dietary Assessment (TDA)
TPB	Theory of Planned Behaviour
TT	Tetanus Toxoid
U.I/UCH	University of Ibadan / University College Hospital
U-5	Under-Five
U5MR	Under-Five Mortality Rate
UN IGME	United Nations Inter-agency Group for Child Malnutrition Estimates

UN IGME	United Nations Inter-agency Group for Child Mortality Estimation
UNDER-5	Under Five
UNICEF	United Nations Children’s Fund
USAID	United State Agency For International Development
VPD	Vaccine Preventable Diseases
WHO	World Health Organisation
GOBI	Growth monitoring, oral rehydration therapy, Breastfeeding, Immunisation,
GOBIFFF	Growth monitoring, oral rehydration therapy, Breastfeeding, Immunisation, family planning, female education, food supplementation, and vitamin A administration
GOBIFFFA	Growth monitoring, oral rehydration therapy, Breastfeeding, Immunisation, family planning, female education, food supplementation, and vitamin A administration

CHAPTER ONE

INTRODUCTION

1.1 Background

Substantial progress in improving child survival has been made worldwide in the past 25 years. Globally, the under-5 mortality rate had dropped by 56%, from 93 in 1990 to 41 deaths per 1,000 live births in 2016 (UN IGME, 2017; UNICEF, 2017). This falling mortality rate saved the lives of 48 million children less than five years of age (UN IGME, 2015; UNICEF, 2016). Similarly, the infant mortality rate has fallen by nearly half. Neonatal mortality (0-27 days old) rate has also declined by 49%, but less steeply than the under-five and infant mortality rates. Post-neonatal mortality rate (1-59 months) has declined by 58% within this period (UN IGME, 2016; UN IGME, 2017).

The annual rate of reduction in under-5 mortality in the world from 2000 - 2015 is more than double the rate achieved in the 1990s (UNICEF, 2016). Every region registered major progress in child survival from 2000 to 2016 (UN IGME, 2017). Nigeria has also witnessed a reduction in under-five mortality rate (U5MR) from 213 in 1990 to 104.3 deaths per 1,000 live births in 2016 with an annual reduction rate of 2.7% (UN IGME, 2017). Though Nigeria had a reduction in U5MR over the years, the rate of reduction is too slow compared to other nations of the world. It still remains one of the countries with the highest U5MR in sub-Saharan Africa and the seventh highest mortality rate in the world (UN IGME, 2015). One in every fifteen Nigerian children dies before their first birthday and one in every eight does not survive to five years of age (NDHS, 2013).

In spite of the gains attained during the MDG era, fifteen thousand children of less than five years still die every day and 11 every minute; this remaining burden of child mortality is not evenly distributed among or within countries. The disparities in child survival despite progress and achievement recorded in the world remain high.

Nearly 9 out of 10 under-five child deaths still occur in low and lower-middle income countries (UN IGME, 2015; UN IGME, 2017).

Most of these deaths or conditions leading to death in children are preventable or treatable largely through proven, cost-effective preventive interventions and early care at household, community, and primary health care levels (NDHS, 2013). These interventions include promotion of adequate nutrition and weight gain during pregnancy, antenatal care, skilled health workers assisting at birth, access to emergency services and after delivery care for both mother and newborn, promotion of breastfeeding, infant and young child caring and feeding practices, hygiene, sanitation, case management of common illnesses at the home and community management of acute malnutrition (NDHS, 2013).

In Nigeria Infant and child mortality is mainly caused by pneumonia, malaria, diarrhoea, under-nutrition and vaccine-preventable diseases. Malaria was the leading cause of this childhood morbidity and mortality accounting for 25% of infant and 30% of child mortality (FMOH, 2006; UNICEF, 2015). Inadequate knowledge and practice of child survival strategies by mothers of under-five children, as well as myths and misconceptions, contribute to morbidity and mortality among under-five children. Abiola et al. (2015) found that 32.4% of mothers in a study in Sokoto, Nigeria, believed that “evil eye” was the cause of diarrhoea among children.

Child survival is the concentrated efforts by governments, the United Nations, organisations, and communities to use effective, low-cost solutions to protect children from illness during their first five years of life (UNICEF, 2008; UNICEF, 2012). It was developed by WHO, UNICEF and World Bank in 2006 to address the issue of the high mortality rate of under-five children in the African region (WHO, 2006). This package of interventions was named child survival strategies, which are stepstaken to ensure the survival of under-five children. Originally, there were four child survival strategies, namely, growth monitoring and promotion, oral rehydration therapy, breastfeeding, and immunisation, given the acronym “GOBI” (WHO, 2002). With time, some other interventions like family planning, female education, food supplementation, and vitamin A administration were added, given the acronym GOBIFFFA (WHO, 2002; WHO, 2006).

Currently, child survival centers on newer strategies such as antenatal care attendance, skilled birth attendance at delivery, and commencement of breastfeeding within one hour of delivery. Others include the use of insecticide-treated bed nets, management of fever, and treatment of acute respiratory infections, amongst others (NDHS, 2013; NNHS, 2014). These proven cost-effective readily available child survival interventions are effective and efficient in preventing and treating diseases that cause morbidity and mortality among under-five children.

Child survival interventions are those interventions designed to address the most common causes of child deaths, which include diarrhoea, pneumonia, malaria and neonatal conditions (UN IGME, 2016). Also included is malnutrition which is an underlying contributor in nearly half of these deaths (UN IGME, 2016). The components of child survival in this study are Newborn care, exclusive breastfeeding, and complementary feeding practices, management of sick children, immunisation, micronutrient supplementation and the use of LLIN. Hand washing and family planning were also included.

The survival of children in Nigeria is threatened by nutritional deficiencies and illnesses, especially diarrhoeal diseases, malaria, acute respiratory infections (ARI), and vaccine-preventable diseases (VPD), which are responsible for the majority of morbidity and mortality in childhood (NDHS, 2013). Only 25% of under-five children in Nigeria are fully vaccinated (NDHS, 2013). Other threats include high maternal morbidity and mortality and underlying factors such as childhood malnutrition, poor immunisation status, household poverty, food insecurity, maternal illiteracy, poor living conditions (housing, water, and sanitation), and poor home practices for childcare during illnesses. Adding to the burden of child morbidity and mortality in Nigeria is the alarming rise in prevalence of HIV/AIDS among pregnant women with resultant mother-to-child transmission (MTCT) (UN IGME, 2012; NDHS, 2013).

According to NDHS (2013), 37% of under-5 children were stunted or too short for their age, which indicated chronic malnutrition among the children. It reported that among mothers with less education (50%) and mothers from the poorest households (54%) stunting was most common (NDHS, 2013). Also, it was more common in rural areas (43%) than in urban areas (26%). Eighteen percent of the children were wasted

(too thin for height), which indicated acute malnutrition and 29% were underweight, or too thin for their age (UN IGME, 2014).

Thus, action to save children's lives by expanding effective preventive and curative interventions must be taken immediately. Also important is an acceleration in the pace of progress which is urgently required to achieve Sustainable Development Goal (SDG) target on child survival, especially in high mortality countries like Nigeria to achieve the SDG target of an under-5 mortality rate of 25 or fewer deaths per 1,000 live births by 2030 (UN IGME, 2016). The implementation of child survival interventions will significantly influence the survival of the child by reducing the incidence and adverse effect of disease morbidity.

1.2 Statement of the Problem

Accelerating progress in child survival requires greater attention to ending preventable child deaths in Nigeria. In sub-Saharan Africa, one child in 12 dies before age five, far higher than the average ratio of one in 147 in high-income countries (UN IGME, 2014). Most of these deaths are caused by diseases that are readily preventable or treatable with proven, cost-effective and quality-delivered interventions. In 2016, in spite of the availability of knowledge and technology for life-saving interventions, about 15,000 children still die daily and one out of every 11 under-five children dies before their fifth birthday, mostly from preventable causes and curable diseases (UN IGME, 2017).

Child mortality is one of the development indicators of health and socioeconomic status that indicates the quality of life of a given population. The knowledge and technology to reduce this mortality among under-5 children already exist. However, action and resources needed to ensure that all children have access to child survival interventions are one of the biggest challenges in reducing child mortality. According to UNICEF (2016), ensuring that basic health care services are available to all children no matter where they live is of necessity in combating this menace. Globally, families, health workers, and governments are employing many strategies in delivering these life-saving interventions. Identifying community-specific factors that influence the uptake of child survival interventions in Nigeria will go a long way in enhancing a significant reduction in U5MR in the nation.

In Nigeria, the U5MR rate varies from one community to the other. Even the coverage for child survival interventions targeted at combatting this rate in the nation differs across the zones. According to UNICEF (2016), rural-urban disparity contributes to unequal chances of child survival. Children born in rural areas are 1.7 times more likely to die before age 5 than children in urban areas. Marked disparities persist in U5MR among regions in the nation. This menace affects both the wealthiest and the poorest households, with the poorest households having the highest mortality rate. Therefore, understanding the causes of child mortality will provide important public health insights to increase the survival of children less than five years. Also, poor child survival practices among mothers of under-five children such as inappropriate or non-use of available interventions: mosquito net, vitamin A supplementation, immunisation, appropriate management of childhood illnesses, exclusive breastfeeding and complementary feeding practices have greatly contributed to increasing the leading causes of child deaths: malaria, diarrhoea, and pneumonia in Nigeria.

Behavioural change communication, which is the strategic use of communication for promoting positive health outcome among people, has been used as an interactive process with communities to develop tailored messages and approaches using a variety of communication channels to develop positive behaviours, promote and sustain individual, community and societal behaviour change; and maintain appropriate behaviours. However, its use in promoting child survival knowledge and practices among mothers of under-five children in Nigeria has been grossly understudied. It is against this background that this study was conducted to evaluate the effect of behavioural change communication on child survival practices among mothers of under-five children in South-west Nigeria.

1.3 Justification for the Study

Behaviour change communication is about changing specific behaviours – “well-defined actions at the household, community and health service levels”. The approach of using behavioural change to promote child survival practices among mothers recognises that behaviour change is more about identifying the causes and barriers to change in behaviour and overcoming these barriers. This approach of using behavioural change communication in improving child survival practices among

mothers of under-five children has been understudied. There is a need for more studies to evaluate the effect of BCC on child survival practices.

In spite of the availability of life-saving intervention through concerted international and national efforts in the nation, the undesirable levels of child mortality, poor child health outcomes have continued to be a debilitating issue of concern in Nigeria. Therefore, there is need to put in place effective and practical measures that will increase the uptake of child survival interventions by improving the knowledge and practices influencing child survival through the exposure of mothers of under-five children to behavioural change communication.

The use of several cost-effective interventions that can significantly reduce morbidity and mortality among children in Nigeria is largely insufficient (Belliet al., 2005; UNICEF, 2014). Health information channeled to caregivers through BCC strategies will thus contribute to improving health outcome through increased coverage of the interventions in South-west Nigeria.

NDHS (2013) revealed disparity in mortality rate across the Nation, Therefore, the knowledge of variables that significantly influences child survival in the society will provide valuable practical leads for combating the low pace in the reduction of under-five mortality witnessed in the nation and also maximise the use of available lifesaving interventions.

The study will assist in boosting the utilisation of child survival intervention in South-west Nigeria and in the nation at large. Conducting BCC for mothers of under-five children will have a direct benefit on the child through its impact on improving household factors by improving mothers practices influencing child survival; thus having an indirect influence on the community at large. The study will increase the knowledge of mothers and the community at large on the different survival interventions available and its importance, which will also increase household and community mobilisation towards increased uptake of child survival intervention in the communities and the nation at large.

Behavioural change communication which is based on behaviour change theories drawn upon various models and theories to provide valuable foundation for developing comprehensive communication strategies for providing behavioural change

interventions to people, has the potential to encourage community and national discussions on basic facts about child survival, the underlying factors that contribute to the epidemic, risk behaviours, environments, and cultural practices. This has the prospect of stimulating discussion both at community and national level that will influence policy aimed at effective and efficient implementation of child survival interventions in Nigeria.

It is about understanding the communities, contexts, and environments in which behaviours occur and using persuasive techniques through BCC strategies to promote practices that influence child survival in Nigeria. It is against this background that this study was conducted to evaluate the effect of behavioural change communication (BCC) on child survival practices among mothers of under-five children in southwest Nigeria.

This study will also have an indirect benefit on health policymakers and leaders at all levels of health care delivery in Nigeria by influencing the positive and realistic formulation of community-specific policies that will increase coverage of child survival interventions and thus help in combating the menace of under-five mortality in Nigeria. Behavioural change communication has been used to improve other areas of health. Therefore, its effects should be tested on child survival knowledge and practices.

1.4 General Objective:

The general objective of this study is to evaluate the effects of behavioural change communication on child survival practices among mothers of under-five children in selected Southwestern states, Nigeria.

1.4.1 Specific Objectives:

The specific objectives of this study are to:

1. Evaluate factors influencing the survival of under-five children in South-west Nigeria;
2. Determine the level of uptake of child survival interventions in South-west Nigeria;

3. Investigate factors causing differences in the uptake of child survival interventions in South-west Nigeria;
4. Compare the prevalence of the indicators of nutritional status before and after Behavioural change communication (BCC) intervention;
5. Evaluate child survival knowledge and practices among mothers of under-five children in the sampled communities before and after the intervention;
6. Evaluate the impact of BCC on the knowledge of mothers of under-five children in South-west Nigeria;
7. Evaluate the impact of BCC on child survival practices among mothers of under-five children in South-west Nigeria.

1.5 Research Hypotheses:

Null hypotheses:

1. There is no difference in the uptake of child survival interventions among states in South-west Nigeria.
2. There is no significant relationship between child survival intervention uptake and nutritional status of under-five children in the selected LGAs in Nigeria.
3. There is no significant relationship between exposure to Behavioural change communication (BCC) and child survival practices among mothers of under-five children in the study

1.6 Definition of Terms

- 1.6.1 Under-five mortality is defined in this study as the probability of dying between age zero and five years (i.e. the probability of dying between age zero and 59 months).
- 1.6.2 Under-five: Under-five is defined as the period between ages 0 and 59 months.
- 1.6.3 Child survival is the concentrated efforts by governments, the United Nations, organisations, and communities to use effective, low-cost solutions to protect children from illness during their first five years of life (UNICEF, 2008; 2012).

- 1.6.4 Household is defined as attributes or features of a domestic unit which consists of the members of a family who live together under the same roof and eat from the same pot.
- 1.6.5 Community variables are the characteristics of a cluster. A community comprises people living in a particular area or in a common location.
- 1.6.6 Local Government Area (LGA): this is a delineated administrative area having a population with homogeneous background and characteristics
- 1.6.7 Behaviour Change Communication (BCC): is defined as the strategic use of communication to promote positive health outcomes which are based on proven theories and models of behaviour change.
- 1.6.8. Child survival is the concentrated effort by governments, the United Nations, organisations, and communities to use effective, low-cost solutions to protect children from illness during their first five years of life (UNICEF, 2008; 2012).
- 1.6.9. Child survival strategies (CSS): is defined as steps taken by individuals and communities to reduce risk, duration or severity of an adverse health condition that detrimentally affects the survival of infants and children less than five years of age (USAID, 2002).
- 1.6.9. Child survival interventions: are interventions designed to address the most common causes of child deaths, which include diarrhoea, pneumonia, malaria and neonatal conditions (UN IGME, 2016). Child survival interventions covered in this study are newborn care, breastfeeding, complementary feeding practices, micronutrient supplementation, management of childhood illnesses, and use of mosquito net.
- 1.7.0. Interpersonal communication approach: is an exchange of information between two or more people. It is the process by which people exchange information, feelings, and meaning through verbal and non-verbal messages. It is face-to-face communication. It is also an area of study and research that seeks to

understand how humans use verbal and nonverbal cues to accomplish a number of personal and relational goals.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Child survival is an essential component of public health concerned with reducing child morbidity and mortality. It was developed by WHO, UNICEF and World Bank in 2006 to address the issue of the high mortality rate of under-five children in the African region (WHO, 2006). Child survival is the concentrated efforts by governments, the United Nations, organisations, and communities to use effective, low-cost solutions to protect children from illness during their first five years of life (UNICEF, 2008; UNICEF, 2012).

Child survival strategies (CSS) are defined as the steps taken by individuals and communities to reduce risk, duration or severity of an adverse health condition that detrimentally affects the survival of infants and children less than five years of age (USAID, 2002). These include breastfeeding, immunisation, oral rehydration therapy, growth monitoring and promotion, female education, family planning and food fortification (WHO, 2006). Many nations of the world are now committed to child survival interventions as an endeavour to reduce child mortality (UN IGME, 2016).

Child survival interventions are those interventions designed to address the most common causes of child deaths, which include diarrhoea, pneumonia, malaria and neonatal conditions (UN IGME, 2016). Also included is malnutrition which is an underlying contributor in nearly half of these deaths (UN IGME, 2016). Child survival and disease control include oral rehydration therapy (ORT) and zinc supplementation to treat diarrhoea, basic immunisations for common ailments, micronutrient supplementation to treat malnutrition (WHO, 2006; Habiman et al., 2010). Child mortality, also known as under-5 mortality or child death, refers to the death of infants and children under the age of five years (UN IGME, 2016).

It is a core indicator of child health and well-being (UN IGME, 2015). The under-five mortality rate is the probability per 1000 that a newborn baby will die before age five if subject to current age-specific mortality rates (World Bank report, 2012; UN IGME, 2016).

The statistics of child deaths through the years indicate a serious public health issue that must be combated. A child's death is emotionally and physically hard on the parents. Many of these deaths are not reported in the majority of the world because poor households cannot afford to register their babies in government facilities (WHO, 2016). In 2016, an estimated 5.6 million children less than five years old died, translating to 15,000 under-five deaths per day, an intolerably high number of largely preventable child death in 2016 (UN IGME, 2017).

2.2 Theoretical framework of child survival

Since infant mortality is extremely high in some parts of the world, the first priority in promoting effective child development is to ensure that children survive the early years when they are most vulnerable to disease and malnutrition. This involves educating the mother or primary caregiver before and after her child is born about providing critical care during the earliest years. This research work is based on the analytical framework of child survival for developing countries by Mosley and Chen (1984), which is based on the premise that all social and economic determinants of child mortality operate through a common set of biological mechanisms, or proximate determinants, to exert an impact on mortality by advancing research on social policy and medical interventions aimed at improving child survival. The analytical framework is used to clarify and understand the factors involved in the household production of healthy children in order to provide a foundation for formulating health policies and strategies.

An important indicator in determining the well-being of a given population is the death of under-five children. It is one of the development indicators for health and socioeconomic status that indicate the quality of life of the populace as measured by life expectancy. It is very important for the evaluation and public health strategy (Desta, 2011). Determinants of infant and child mortality were classified into exogenous (socioeconomic or extrinsic): cultural, socioeconomic, community, and

regional; endogenous (bio-medical or intrinsic) such as maternal, environmental, nutrition, injuries and personal illness (Mosley & Chen, 1984). Socioeconomic factors affect the survival of the child indirectly, as they operate through proximate factors while proximate determinants had a direct impact on child survival (Mosley & Chen, 1984).

The analytical framework of child survival according to Mosley and Chen (1984) is based on the following assumptions:

1. In an optimal setting, over 97 percent of children born can be expected to survive through the first five years of life.
2. Reduction in this survival probability in any society is due to the operation of social, economic, biological and environmental forces.
3. Socioeconomic determinants (independent variables) must operate through basic proximate determinants that in turn influence the risk of disease and the outcome of disease processes.
4. Specific diseases and nutrient deficiencies observed in a surviving population may be viewed as biological indicators of the operations of the proximate determinants.
5. Growth faltering and ultimate mortality in children or survival of children (dependent variable) are the cumulative consequences of multiple disease processes (including their biosocial interactions); only on rare occasions is a child's death the result of a single isolated disease episode.

Mosley and Chen (1984) specified that the key to the model is the identification of a set of proximate determinants or intermediate variables that directly influence the risk of morbidity and mortality. All social and economic determinants must operate through these variables to affect child survival. The proximate determinants were grouped into five categories.

1. Maternal factors- include variables such as age, parity and birth intervals: each of these variables has an impact on infant and child mortality by affecting their mothers' health. Synergism may also be considered as maternal factors, for example, birth interval categories (example short, medium, long) with mothers' age categories (example five year age group).

2. Environmental contaminations: hygiene factors, water, and sanitation - each factor spreads or transmits the infectious disease to mothers or children.
3. Nutrient deficiency (calories, protein, and micronutrient deficiency) - this affects infant and child mortality by decreasing the probability of child survival and also has an impact on the mothers of the children. For example, newborn children's weight and quality of breastmilk are affected by the nutrition of mothers during pregnancy and lactation.
4. Injury: it includes physical, burns and poisoning. Injuries increase infant and child mortality, especially during the infanticide period.
5. Personal illness control (Immunisation, bed net, malaria prophylaxis and so on): is related to the traditional and modern preventative measures of avoiding disease during pregnancy and childbirth. The quality of these preventative measures is important and has a great impact on pregnancy outcome and child survival through its effect on both mothers and children (Mosley & Chen, 1984).

These determinants are summarised in figure 2.1 below. All proximate determinants in the first four groups influence the rate of shift of healthy individuals toward sickness. The personal illness control factors influence both the rate of illness (through prevention) and the rate of recovery (treatment).

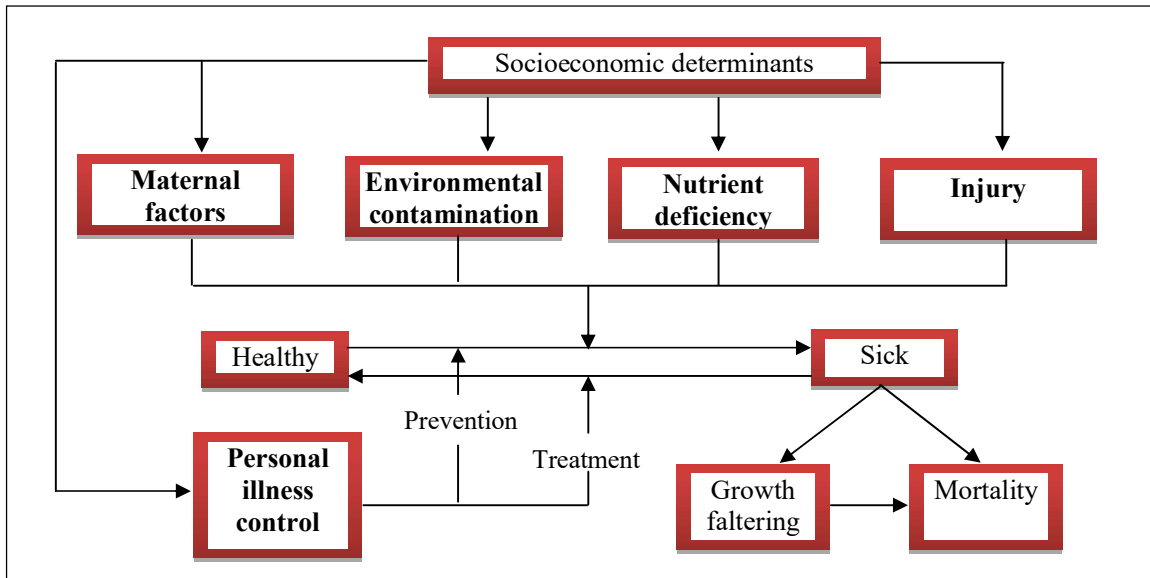


Figure 2.1 Operation of the five groups of proximate determinants on the health dynamics of a population

Mosley and Chen (1984) also classified the socioeconomic determinants of infant and child mortality into individual, household and community level variables.

- ◆ Individual-level variables: individual productivity (fathers, mothers); traditional/norms/attitudes.
- ◆ Household-level variables: income/wealth.
- ◆ Community-level variables: ecological setting; political economy; health system.

On the individual level; the three main determinants of child survival are fathers' and mothers' skills, health and time. Fathers' and mothers' educational attainments are usually used for measuring parental skills which have important implication for the survival of the child. The educational level of the mother may improve child survival by influencing care seeking, morbidity, and nutritional status while father's educational level, particularly in urban areas, is strongly associated with occupation and household income, household decision making and father's personal illness. However, mother's educational level is the primary important determinant for the survival of the child. Due to strong biological association between mother and child during pregnancy and lactation, the level of mother's educational attainment influences her health, nutritional status, productivity behaviours and knowledge of childcare practice associated to contraception, nutrition, hygiene, preventive care and

disease treatment that will affect the health and survival of the child (Mosley & Chen, 1984).

Furthermore, the mother's schedule such as the period spent on health and sickens care, food preparation, laundry, caring for the child and household environment and so on have an impact on child survival. This mother's time can be linked to her income-generating activities that increase the survival of the child. In traditional society, labour division by sex enables mothers to have much time for taking care of the child. Nevertheless, in many developing nations, the economic situation of the household determines the mother's time for taking care of their children. For wealthier families, it may be easier to allocate the appropriate time needed for childcare. When such mothers are outside the home for work, they have the capacity to hire skilled or attentive nursemaid who will care for the child while in poor households, mothers neglect the child for a less-skilled or non-skilled sibling. This indicates that the mother's time highly depends on the economic situation of the household, which has an impact on infant and child mortality (Mosley & Chen, 1984).

Traditional behaviours/norms/attitudes are other important individual-level variables in the socio-cultural dimension that shape and modify an individual's economic choice and health outcomes (Mosley & Chen, 1984). For instance, mothers are fully responsible for childcare in most traditional society and therefore, may have a little allocation of resources in relation to the time use, expenditure allocation, nutrition choice, and health practices. Also, mothers' empowerment is another factor that affects fertility and reproduction choice which highly influences child survival. Other cultural determinants are the value of children, belief in disease causation, and food preference. Cultural differences between society and regions also have an impact on the child survival probability of male and female children (Mosley & Chen, 1984).

Household level factors consider the effect of income or wealth and variety of goods, services and assets on the survival of young children through operating the intermediate factors of child survival (Mosley & Chen, 1984; Desta, 2011).

In the same vein, community-level factors include ecological setting (climate, soil, rainfall, temperature, altitude, and seasonality): these variables, particularly in rural areas, are crucial determinants of child survival through its influence on income

generation, use of medical facilities, time available to mothers for child care, political economy (infrastructure, political institution and health system variables) and availability of health services. These result in urban/rural differences in infant and child mortality observed in many developing nations of the world (Mosley & Chen, 1984; Desta, 2011). The interaction between socioeconomic determinants and proximate determinants influencing infant and child survival is shown in figure 2.2

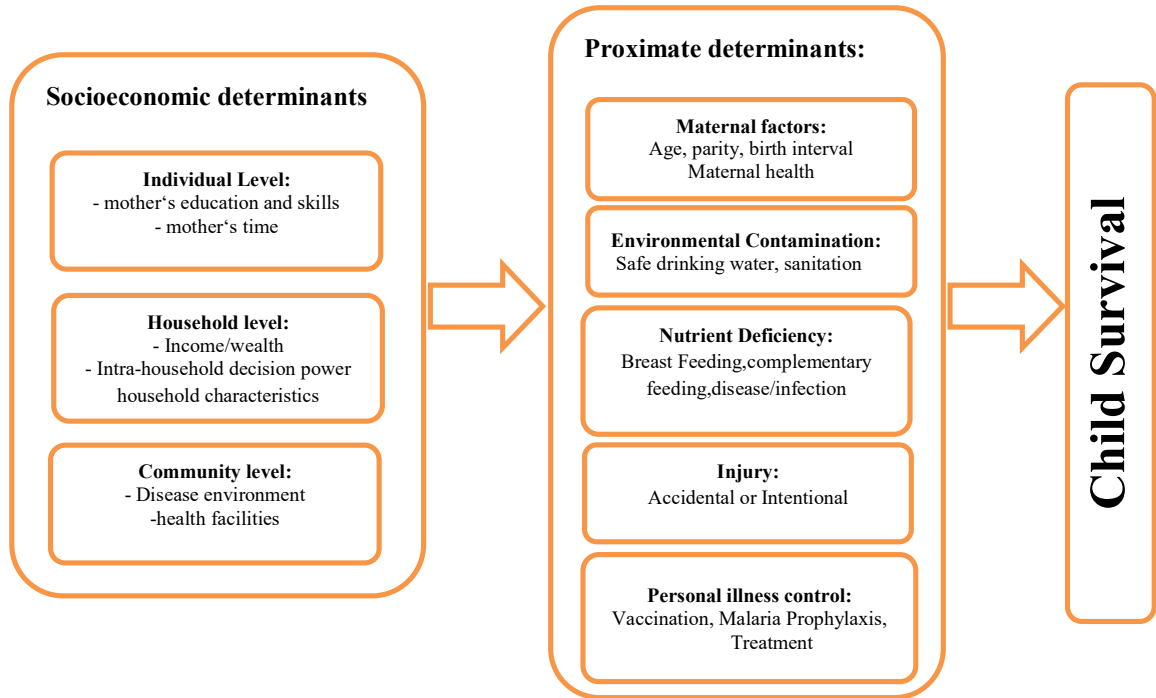
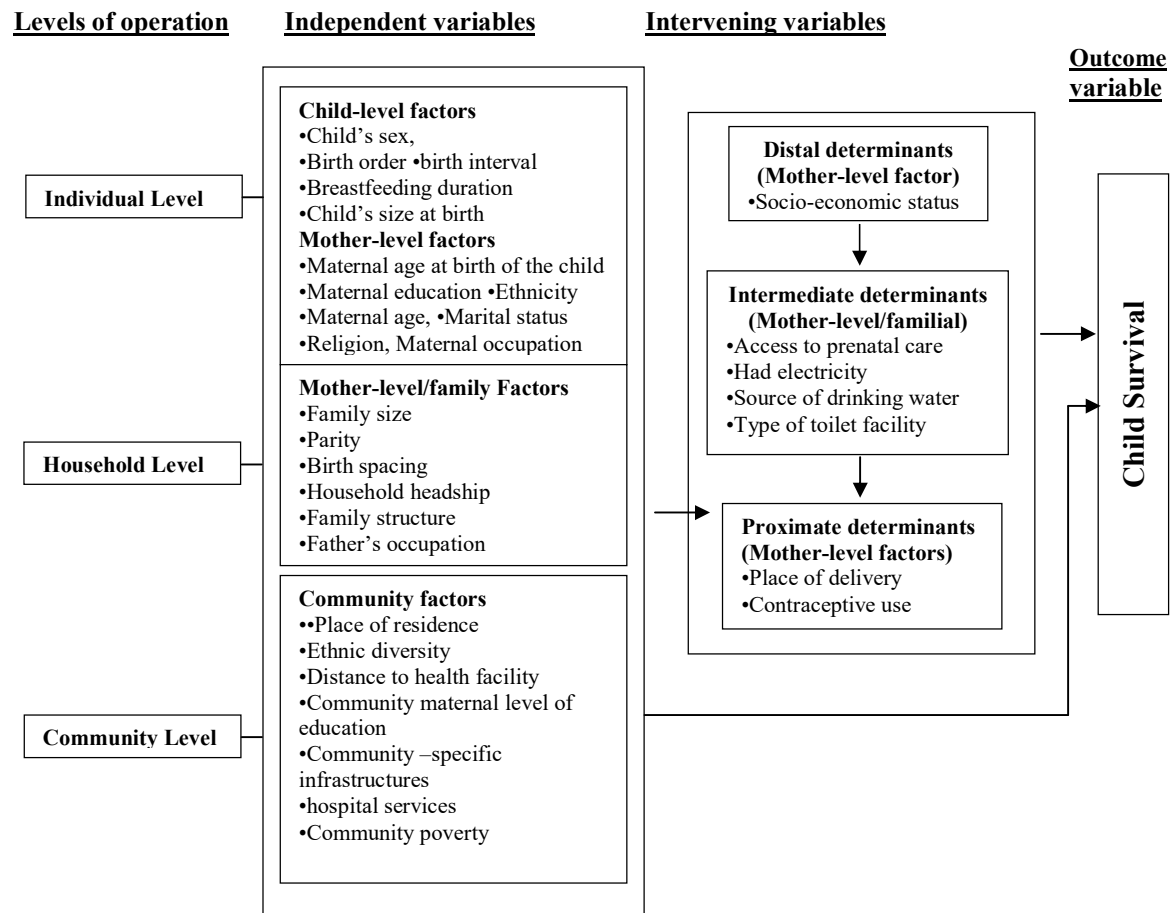


Figure 2.2 Interaction between socioeconomic determinants and proximate determinants
Source: Adapted from Mosely and Chen (1984) and Desta (2011) theoretical framework

2.3. Logical / Conceptual Framework for the study

The framework for this study was guided by findings from the reviewed literature and from both Mosley-Chen model and Destal theoretical framework. The framework considers factors at different levels and their impact on child survival. The logical framework showed the three levels of interactions among factors influencing child survival. The individual level (i.e. level one) consists of the mother and her child together, they reside in a household unit (i.e. level two) and the household unit, in turn, is situated within a community (i.e. level three).

The determinants at each of the levels within the broad hierarchical structure can influence child survival through interactions of attributes at the various levels. The conceptual framework showed a logical organisation of the correlates of child survival which enhance the understanding of factors that are likely to impact the survival of under-five children in the study. The conceptual framework for this study is shown in the diagram below:



(Guided by Mosley & Chen, 1984; Destal 2011 frameworks)

Figure 2.3: Conceptual framework of determinants of child survival in the study

2.3.1 Direction of the relationship among variables in the logical framework

The outcome variable (child survival) is directly influenced by a few of the independent variables. However, the outcome variable is influenced by a good number of the independent variables through the set of intervening variables as shown in figure 2.3. Variables that exert direct influence on child survival in the logical framework include maternal age, maternal age at first birth, maternal education, a region of residence ethnicity and child's sex. The direction of interrelationships among the variables is shown by the arrows in the figure above.

2.4. Components and indicators of essential packages of child survival

According to UNICEF, half of the world's countries are already at or below the 2030 target, and only need to sustain these gains and target efforts at subnational populations. But the other half of the world needs much more action and commitment (UNICEF, 2015). Five strategies to lower mortality rates, with a focus on those countries with the highest rates and burdens were stated as:

1. Concentrate resources on countries and regions with the most child deaths: sub-Saharan Africa, South Asia, fragile States, and the least developed countries.
2. Increase efforts among high-burden populations, such as those in India and Nigeria.
3. Focus on expanding and investing in vital health services.
4. Address underlying causes: Invest in education, infrastructure, water and sanitation, and jobs.
5. Take shared responsibility for the goal of drastically reducing the deaths of children under age 5 in the next two decades (UNICEF, 2015).

To scale up the improvement in child survival in many countries, life-saving interventions such as breastfeeding promotion, oral rehydration therapy, use of insecticide-treated mosquito nets to prevent malaria, use of complementary foods, use of antibiotics for the treatment of antenatal sepsis and childhood pneumonia, and

prevention of zinc deficiency were provided. However, levels of coverage for these interventions are still unacceptably low in most low-income and middle-income countries. Worse still, coverage for some interventions such as immunisations and attended delivery, are stagnant or even falling in several of the poorest countries. Proven, cost-effective interventions can save the lives of millions of children per year (Habimana et al., 2010; UNICEF,2014).

Actions that influence essential child survival packages arean improvement in water, sanitation and the environment, birth spacing, promoting gender equality, empowerment of women and women’s education, prevention of mother-to-child transmission of HIV and family planning. Health systems, which deliver interventions necessary to save children’s lives, are increasingly complex and continually changing. Thus the World Health Organisation(2006) identified ten core indicators for accessing the components of child survival. The table below summarises these components and their core indicators.

Table 2.1: Ten core indicators for child survival

Ten core indicators for child survival	
Components of essential package	Core indicators
Skilled attendance during pregnancy, delivery and the immediate postpartum	1. The proportion of births assisted by skilled health personnel
Care of the newborn	2. The proportion of infants less than 12 months of age with breastfeeding initiated within one hour of birth
Breastfeeding and complementary feeding	3. The proportion of infants less than 6 months of age exclusively breastfed 4. The proportion of infants 6-9 months of age receiving breast milk and complementary food
Micronutrient supplementation	5. The proportion of children 6-59 months old who have received vitamin A in the past 6 months
Immunisation of children and mothers	6. The proportion of one-year-old children immunised against measles 7. The proportion of one-year-old children protected against neonatal tetanus through immunisation of their mothers
Integrated management of sick children	8. The proportion of children 0-59 months of age who had diarrhoea in the past 2 weeks and were treated with ORT 9. The proportion of children 0-59 months of age who had suspected pneumonia in the past 2 weeks and were taken to an appropriate health care provider
Use of insecticide-treated bed nets	10. The proportion of children 0-59 months of age who slept under an insecticide-treated net the previous night

Adapted from WHO and UNICEF (2006) minimal set of key indicators for monitoring progress towards child survival

UNICEF (2016) emphasised that the essential package for children, comprised of interventions such as: management of common childhood illnesses and severe acute malnutrition, including community management where applicable using Integrated Community Case Management (ICCM) of diarrhoea, malaria, and pneumonia; newborn care, taking into consideration the life cycle approach and continuum of care; adoption by caregivers of key family practices; prevention of malaria using insecticide-treated nets (ITNs) and intermittent preventive treatment of malaria (IPT); prevention and management of severe and moderate acute malnutrition; Infant and young child feeding, including micronutrient supplementation and deworming; provision of maternal and childhood immunisation and promotion of new vaccines; prevention of mother-to-child transmission (PMTCT) of HIV; management and care of HIV-exposed or infected children and management and care of TB-exposed or infected children (UNICEF, 2016).

2.5 Epidemiology and Burden of Child Mortality

Conceptually, the theory of epidemiologic transition focuses on the complex change in patterns of health and disease and on the interactions between these patterns and their demographic, economic and sociologic determinants and consequences. An epidemiologic transition has paralleled the demographic and technologic transitions in the now developed countries of the world and is still underway in less-developed societies (UNICEF, 2017). The decline in mortality that comes with the epidemiologic transition widens the demographic gap between birth and death rates and affects demographic change by bolstering population growth. Childhood mortality varies by the classic epidemiological characteristics of person, place and time.

The risk of a child dying before completing five years of age is highest in the WHO African Region (81 per 1000 live births), about 7 times higher than that in the WHO European Region (11 per 1000 live births) (WHO, 2017). Many countries have very high under-five mortality – particularly those in WHO African Region, home to 6 of the 7 countries with an under-five mortality rate above 100 deaths per 1000 live births. In addition, inequities in child mortality between high-income and low-income countries remain large. In 2015, the under-five mortality rate in low-income countries

was 76 deaths per 1000 live births – about 11 times the average rate in high-income countries (7 deaths per 1000 live births). Reducing these inequities across countries and saving more children's lives by ending preventable child deaths are important priorities (WHO, 2017).

Significant improvement has been made in child health. However, improvements in child survival and health have not been equally distributed and several nations and communities continued to face unacceptably high levels of child mortality. Significant gaps remain between the richest and poorest families, both between countries and within countries (UNICEF, 2016).

Nigeria has huge variations in U5MR across the various geopolitical regions. There is a substantial geographic variation in the patterns of under-five mortality rates in the country, from the lowest of 90 per 1000 live births in South-west to the highest of 185 per 1000 live births in North-west Nigeria (NDHS, 2013). A number of reasons have been given for this enormous regional disparity (Adedini, 2015). Aremu et al. (2011) noted that living in an economically and socially deprived community or neighbourhood is associated with increased risk of under-five mortality.

Antai's (2010) in a study on inequality in under-five mortality in Nigeria found that under-five mortality was highest among Hausa/Fulani/Kanuri in Northern Nigeria. Basically, these ethnic groups have the poorest maternal and child health indicators – access to good quality health care and availability of skilled birth attendants. Also, Antai and Moradi (2010) in another study discovered that under-five mortality in urban areas was positively correlated with the rate of urbanisation over the 1983-2003 periods in Nigeria. In the same vein, Antai (2011b) established that the rates of under-five mortality were significantly higher in some regions compared to the others and stressed the need for further studies on community-specific determinants of under-five mortality in Nigeria.

Infant and child mortality differ substantially among the regions of the world. Unfortunately, the vast majority of this childhood mortality are preventable by low-cost public health interventions (Jones et al., 2003; UNICEF, 2016). Moreover, the majority of deaths in low-income countries are still from preventable infectious diseases including pneumonia, diarrhoea, and malaria. Progress is hindered in many

low- and middle-income countries by weak health systems, resulting in the global recognition of the importance of investing in health systems strengthening, with a particular focus on strengthening the community as an integral component of the broader health system (UNICEF, 2016).

Nine out of 10 under-five child deaths still occur in low- and lower-middle income countries (UN IGME,2015). Though Nigeria had a reduction in U5MR over the years, the rate of reduction is too slow compared to other countries of the world. Only 25% of under-five children in Nigeria are fully vaccinated and 37%, 18% and 29% of children underage five were stunted, wasted and underweight respectively (NDHS, 2013;UN IGME,2014).

The highest U5MR in the world was 167 in Angola while Nigeria is the seventh highest (UNICEF, 2014). Likewise, there are disparities between wealthy and poor households in developing countries. According to ‘Save the Children Paper’, children from the poorest households in India are three times more likely to die before their fifth birthday than those from the richest households (Save the children, 2012). Likewise, the child survival rate of nations varies with factors such as fertility rate and income distribution; the change in distribution showed a strong correlation between child survival and income distribution as well as fertility rate(Hans, 2006; Aremu, et al., 2011).

WHO (2017) reported that most of the children who die each year could be saved by low-tech, evidence-based, cost-effective measures such as vaccines, antibiotics, micronutrient supplementation, insecticide-treated bed nets, improved family care,breastfeeding practices, and oral rehydration therapy. Empowering women, removing financial and social barriers to accessing basic services, developing innovations that make the supply of critical services more available to the poor and increasing local accountability of health systems are policy interventions that have allowed health systems to improve equity and reduce mortality (UN IGME, 2015).

In developing countries, child mortality rates relating to respiratory and diarrhoeal diseases can be reduced by introducing simple behavioural changes, such as hand washing with soap. This simple action can reduce the rate of mortality from these diseases by almost 50 percent.Proven, cost-effective interventions can save the lives

of millions of children per year. Despite the success of immunisations in reducing polio, tetanus, and measles, the interventions still do not reach 30 million children. Measles and tetanus still kill more than 1 million children under 5 each year. About 250,000 and 500,000 children become blind every year, with 70 percent of them dying within 12 months. Vitamin A supplementation which costs only \$0.02 cents for each capsule and given 2-3 times a year will prevent blindness and death among under-five children. Though Oral rehydration therapy (ORT) has helped to reduce diarrhoea deaths by half, saving an estimated 1 million lives annually, more than 2 million children still die from diarrhoea-related causes each year (WHO, 2015; You et al., 2015).

Essential newborn care - including immunising mothers against tetanus, ensuring clean delivery practices in a hygienic birthing environment, drying and wrapping the baby immediately after birth, providing necessary warmth, and promoting immediate and continued breastfeeding, immunisation, and treatment of infections with antibiotics - could save the lives of 3 million newborns annually. Improved sanitation and access to clean drinking water can reduce childhood infections and diarrhoea. Over 40% of the world's population does not have access to basic sanitation, and more than one billion people use unsafe sources of drinking water (UNICEF, 2017).

With the end of the MDG era, the international community has developed a new framework – the Sustainable Development Goals (SDGs) where the target is to end preventable deaths of newborns and children under 5 years of age. The proposal is for all countries to reduce under-five mortality to at least as low as 25 per 1000 live births. Currently, 79 countries have an under-five mortality rate above 25, and 47 of them will not meet the proposed SDG target of 25 deaths per 1000 live births by 2030 if they continue in their current trends of reducing under-five mortality (UNICEF, 2016;WHO, 2017).

2.5.1. The trend in child mortality across the Globe

Globally, the under-five mortality rate has decreased by 56%, from an estimated rate of 93 deaths per 1000 live births in 1990 to 41 deaths per 1000 live births in 2016. The average annual rate of reduction in under-five mortality has accelerated – from 1.8% a year over the period 1990–2000 to 3.9% for 2000–2015 (UN IGME, 2016; UN

IGME, 2017). This indicated substantial progress in improving child survival worldwide as 15 000 fewer children died every day in 2016 than in 1990, the baseline year for measuring progress (WHO, 2017; UN IGME, 2017).

Even in Sub-Saharan Africa, the region with the highest mortality rate in the world, the annual rate of reduction increased from 1.6% in the 1990s to 4.1% in 2000-2015 (UNICEF, 2015). This remarkable decline in under-5 mortality since 2000 has saved the lives of 48 million under-five children worldwide. Nigeria has also registered a substantive U5MR from 213 in 1990 to 104 deaths per 1,000 live births in 2016 (UNIGME, 2017).

Table 2.2 Levels and trends in U5MR by WHO Millennium Development Goal region from 1990 to 2015.

Region	Under-five mortality rate (deaths per 1,000 live births)						Decline (%)	Annual rate of reduction(%)		
	1990	1995	2000	2005	2010	2015	1990-2015	1990-2015	1990-2000	2000-2015
Developed regions	15	11	10	8	7	6	60	3.7	3.9	3.5
Developing regions	100	94	83	69	57	47	54	3.1	1.8	3.9
Northern Africa	73	57	44	35	28	24	67	4.4	5.0	4.1
Sub-Saharan Africa	180	172	154	127	101	83	54	3.1	1.6	4.1
Latin America and the Caribbean	54	42	32	25	24	18	67	4.4	5.2	3.9
Caucasus and Central Asia	73	74	63	49	39	32	56	3.3	1.4	4.6
Eastern Asia	53	46	37	24	16	11	79	6.3	3.7	8.1
Eastern Asia excluding China	27	33	30	19	16	14	49	2.7	-1.1	5.3
Southern Asia	126	109	92	76	62	51	59	3.6	3.2	3.9
Southern Asia excluding India	126	109	93	79	68	59	53	3.0	3.0	3.1
South-eastern Asia	72	59	49	40	33	27	62	3.9	3.9	3.9
Western Asia	66	54	43	35	27	22	66	4.3	4.3	4.3
Western Asia	75	70	67	64	57	51	32	1.1	1.5	1.9
Oceania	91	85	76	63	52	43	53	3.0	1.8	3.9

(Adapted from UN IGME,2015)

2.5.2: Overview of Infant and Child Mortality in Africa

Sub-Saharan Africa, the region with the highest rate of child mortality, lowered its under-five mortality rate by 48% since 1990. All twelve countries with an under-five mortality rate of 100 or more deaths per 1,000 live births are in sub-Saharan Africa, and 10 of these are in West and Central Africa (UNICEF, 2016). On average, one out of every 11 children born in sub-Saharan Africa dies before age five. This is nearly 15 times the average for developed regions (UNICEF, 2015).

It was revealed by demographic and public health literature that infant and child mortality has remained a daunting challenge in Africa. Especially in sub-Saharan African countries where there exists a huge variation in infant and child mortality rates (Adedini, 2015). Becher (2010) also, reported that about one-third of all countries in Africa had a 30% or more decline in under-five mortality, while in contrast, about 20 countries sadly show a considerable increase.

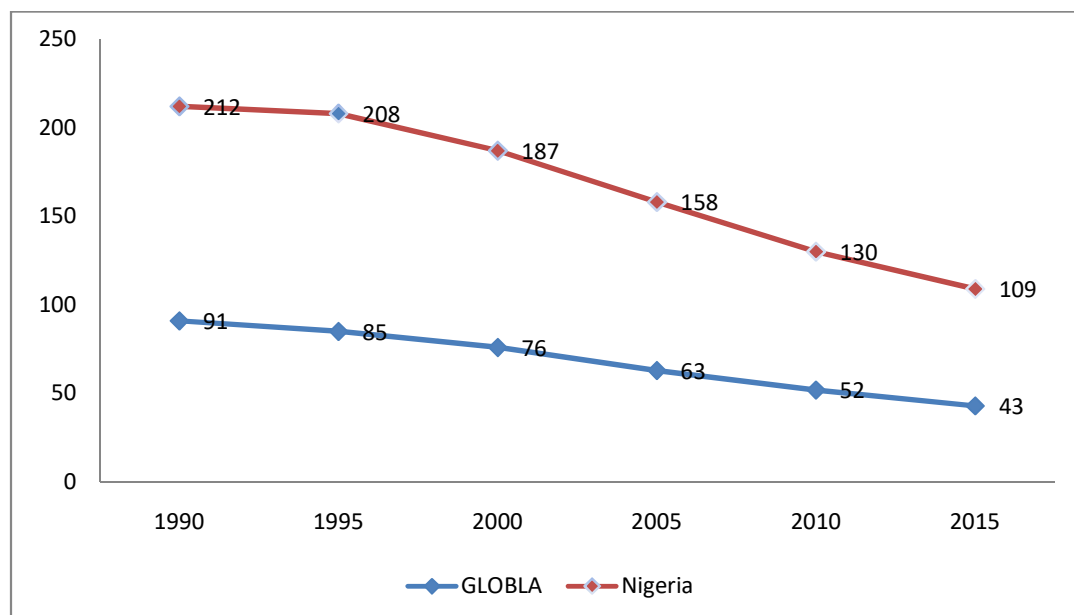
Several factors have been adduced for the persistent high infant and child mortality in Africa. Sear et al. (2002) discovered that in the rural area of Gambia, the presence of the child's mother, maternal grandmother or an elder sister has a significant positive relationship with the survival of children. Corroborating this point, Sear et al. (2008) noted that due to the lack of alternatives to breast milk, an infant is unlikely to survive after the death of his/her mother. All these findings point to the significance of the mother's care in a child's health and survival. The study further revealed the harmful effect of mothers remarrying a new husband on a young child, a practice common in many countries. Similarly, the importance of maternal age and breastfeeding practice for the newborn was established by Berger et al. (2002). They stressed that the age of mothers at birth and the duration of breastfeeding was positively associated with child mortality.

However, Buor (2002) in a study on the effect of mothers' education on childhood mortality in Ghana discovered that the educational status of mothers was inversely related to childhood mortality. In contrast, Anderson et al. (2002) in their study among the African and coloured population in South Africa reported that the educational status of mothers apart from their environmental factors such as the source of domestic water and type of sanitation had a significant influence on infant and child

survival. Argeseanu (2004) stressed that the children of married women have a greater advantage of surviving compared to the children of unmarried women. However, the findings reported that children in polygamous settings tend to have protection and higher survival chances than those in monogamous unions. On the contrast, Omariba and Boyle (2007) observed that children in polygamous households were at greater risks of dying than children whose mothers were in monogamous unions.

2.5.3: THE NIGERIA SCENARIO

Although analyses of recent trends show that the country is making progress in cutting down infant and under-five mortality rates, the pace remains too slow and one in every 15 Nigerian children dies before reaching age one. One in every eight does not survive to his or her fifth birthday (NDHS, 2013; FMOH, 2016). Most of these child deaths are caused by diseases that are readily preventable or treatable with proven, cost-effective interventions and early care at household, community, and primary care levels (UN IGME, 2014; UNICEF, 2016). Therefore action must be taken immediately to save children’s lives by expanding effective preventive and curative interventions in and within all communities. Figure 2.4 showed a slow pace in the reduction of under-five mortality in the nation as against the global rate of reduction in under-five mortality.



Adapted from WHO (2017)

Figure 2.4 Trend in under-five mortality

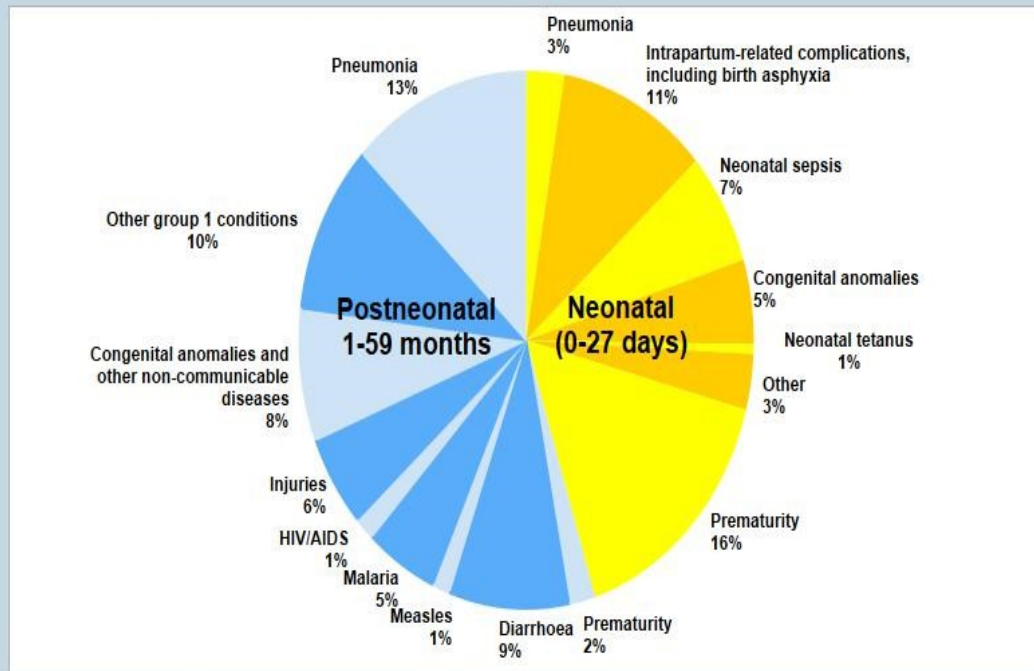
Preventable or treatable infectious diseases such as malaria, pneumonia, diarrhoea, measles and HIV/AIDS account for more than 70 percent of the estimated one million under-five deaths in Nigeria. Malnutrition is the underlying cause of morbidity and mortality of a large proportion of children under the age of five in Nigeria. It accounts for more than 50 percent of deaths of children in this age bracket (UNICEF, 2016).

Griffiths et al. (2004) examined the multilevel comparison of the determinants of child nutritional status using DHS data from seven countries including Nigeria emphasised the significance of individual and household-level characteristics such as age, duration of breastfeeding, recent diarrhoea episodes, maternal education and size of a child at birth. Grais et al. (2007) study on child mortality in Niger, Nigeria, and Chad established that preventable diseases such as measles have remained a serious killer disease in some parts of the three countries.

Furthermore, Chirdan et al. (2008) in their studies revealed that formal education and health education significantly improved child survival. Similarly, Anyamele (2009) in analysing DHS data of selected sub-Saharan African nations, including Benin and Nigeria supported the findings by Chirdan and colleagues by establishing that literacy is significantly associated with child mortality.

2.6: Determinants of child mortality

The effort to understand the factors influencing infant and child mortality in Nigeria and other developing countries is of utmost importance as this phenomenon has remained a major public health challenge. Under-five mortality is the result of a complex web of determinants at many levels (WHO, 2016). Understanding the causes of child mortality provides important public health insights for providing measures to control and prevent these deaths. WHO (2016) identified, the causes of deaths among children in 2015 as illustrated in the figure below:



Source: WHO-MCEE methods and data sources for child causes of death 2000-2015 (Global Health Estimates Technical Paper WHO/HIS/IER/GHE/2016.1)

Figure 2.5 Causes of under-five mortality

Whitworth and Stephenson's (2002) discovered that higher maternal educational level weakens the effect of the short birth interval in India due to increased female autonomy and access to resources which may reduce competition for resources that often characterise short birth interval. Establishing that the pathway through which short birth intervals increased mortality risk among children was the competition for resources that existed between newborn and the previous sibling, thus children of young mothers, children of mothers with high parity and children whose previous sibling died or were breastfed for short durations had higher risks of dying if their births followed a short birth interval. Similarly, Uthman (2008) observed that the educational status of mothers significantly plays a protective role against infant mortality in Nigeria. Likewise, in a study by Antai (2011a) disparities in the maternal level of education among various ethnic groups in Nigeria were attributed to ethnic differentials in the risk of under-five mortality.

Sahn and Stifle (2003) used data from DHS for 24 African countries found that infant mortality in urban areas was lower than in rural areas. Various factors contribute to this urban-rural variation such as better education, improvement of public and health infrastructures in urban than in rural areas. However, the HIV/AIDS epidemic is partly responsible for the high risk of infant and child mortality in Africa, particularly in sub-Saharan countries.

Furthermore, Griffiths et al. (2004) opined that child mortality was more prevalent than childhood malnutrition in sub-Saharan Africa, while in India, malnutrition affects about half of the young children. This suggests that children in the same community have homogenous nutritional outcomes because of shared behavioural practices like cultural norms regarding food. Some covariates of child malnutrition were identified as child birthweight, child's age, educational status of mothers, breastfeeding status, and last diarrhoea episode. Similarly, Lykens et al. (2009) reported that nutrition was a significant factor in child survivability. Also, Kravdal (2004) observed that the average maternal educational status in the community influences mothers' educational attainment which operates through community-level variables.

Additionally, Subramanian et al. (2006) provided evidence that the economically disadvantaged are affected by the burden of poor health outcomes emphasising the socio-economic effect of mortality among Indians. Also, Schell et al. (2007) established that the relative significance of key determinants of health varies substantially among income levels making it difficult to extrapolate health strategies from high to low-income countries. This assertion resulted from their study on socio-economic determinants of infant mortality in 152 low, middle and high-income countries.

Goro (2007) using multivariate logistic regression model on DHS survey data for 1993, 1998 and 2003 from three northern regions in Ghana discovered that child's birth order, education and marital status of mothers were powerful significant determinants for infant mortality, while only maternal education had a significant impact on child mortality. Similarly, Omariba et al. (2007) using the 1998 Kenyan DHS data portends that while demographic factors were more important in explaining infant (under 12 months) mortality, socioeconomic, sanitation, cultural and hygienic factors were more important in explaining child (under five) mortality. Younger

(2007) however, do not find significant effects of variables related to the quality of drinking water. On the other hand in Zimbabwe, regional differences in health infrastructure, communication and disease prevalence conditions, sanitation and drinking water highly affect infant and child mortality differential which exist between urban-rural residence (Zimbabwe Central Statistical Office/ Macro International Inc, 2007).

Additionally, Sear and Mace (2008) established that the presence of maternal grandmothers tend to improve child survival rates, while the presence of certain otherkins was also found to be inimical to child survival. In a study by Antai (2010) on the relationship between migration and child health inequalities in Nigeria also established that children of rural-urban migrants tend to have significantly higher under-five mortality compared to the children of rural non-migrant mothers.

Mustafa and Odimegwu (2008) from 2003 DHS data for Kenyan children, examined socioeconomic determinants of infant mortality rate in both urban and rural setting using logistic regression models. They found that regional variation exists in infant and child mortality between the different provinces of Kenya. Most of the socioeconomic factors were not associated with the risk of infant and child mortality while children born in the richest household had a lower probability of mortality relative to children born in the poorest households. However, ethnicity and breastfeeding in both urban and rural areas had a significant influence on infant mortality. Birth order, the birth interval in rural areas and sex of the child in urban areas, were important determinants for the risk of infant mortality. They also discovered that the incidences of HIV/AIDS in both urban-rural areas increased the risk of dying at infancy period.

Similarly, Kembo and Ginneken (2009), using the result of 2005-2006 Zimbabwean DHS to investigate the maternal, socioeconomic and sanitation factors on infant and child mortality using Cox regression model, posited that high risk of infant and child mortality was significantly associated with the birth order (6+) having a short preceding interval. Multiple births tend to increase infant and child mortality. However, the study showed that the expected U shape relationship between birth order and infant and child mortality, and mothers age and infant and child mortality was not confirmed in their analysis: children who were first born and those born to

mothers aged 40-49 years were found to decrease infant and child mortality. However socioeconomic determinants were rather small and had an insignificant effect on infant and child mortality. Consequently, they suggested that the influence of birth order, preceding birth intervals, maternal age, and type of birth and sanitation factors were more pronounced on infant mortality but had a weak effect on child mortality.

Likewise, Kumar and File (2010) examined selected socioeconomic, bio-demographic and maternal health care factors that determine child mortality in Ethiopia. They reported that birth interval with preceding birth and maternal educational level were the socioeconomic variables that had a significant impact on lowering the risk of child mortality. The result confirmed that child mortality risk associated with children of less than 2 years of the birth interval with the previous child was highest (15%) and lowest (4.2%) for the children whose birth interval was 4+ years. Additionally, they reported that higher maternal educational level was significantly correlated to low risk of child mortality as compared to children of illiterate mothers and fathers with primary educational level. Birth order and place of residence were also important determinates of child mortality in Ethiopia.

Furthermore, Kumar and File (2010) using data from the Ethiopia Demographic and Health Survey [EDHS] 2005 to investigate the predictors' of child (0-5 years) mortality in Ethiopia, revealed that birth interval with previous child and mother's standard of living index were the vital factors associated with child mortality. They concluded that an increase in Mothers' education and improved health care services were significant in reducing child mortality in Ethiopia.

In the same vein, Kanjala et al. (2010) found out that, children of mothers with primary and secondary education were 18% and 47% less likely to die respectively compared with children of mothers with no education. Palma-Soliso et al. (2009) noted that infant and child mortality rates were associated with several manifestations of the people's living conditions. Furthermore, Antai et al. (2010) stressed that improved access to health care services in Nigeria can be achieved through community-level interventions. Subsequently, Antai (2011a) asserted the need for further studies on community-level determinants of under-five mortality in Nigeria, as the survival chances of children were affected by the social and environmental context of where children live.

Additionally, Mesike and Mojekwu (2012) in their study, examined the environmental determinants of child mortality in Nigeria using principal component analysis and simultaneous multiple regression for child mortality modeling in Nigeria. Estimation from the study showed that household environmental characteristics do have a significant impact on mortality as lower mortality rates were experienced in households that had access to immunisation, sanitation facilities, good and proper refuse and solid waste disposal facilities, good healthy roofing and flooring materials as well as those using low polluting fuels as their main source of cooking.

In another study to examine the contextual determinants of infant and child mortality in Nigeria, 3,775 and 18,028 women amounting to 6,028 and 28,647 live births within five years preceding 2003 and 2008 surveys respectively of women aged 15-49 years who had at least a live birth in the five years preceding the surveys were extracted from the NDHS datasets. The study showed that region of residence, place of residence, ethnic diversity, community education, community infrastructures, and community health contexts were significant contextual determinants of infant and child mortality in the nation during the periods studied (Adedin, 2013).

The study by Adedin (2013) also revealed that lower risks of infant and child mortality were associated with living in communities with a high proportion of hospital delivery and a higher risk of child mortality were significantly associated with living in communities with a high concentration of poor households. Many of the selected variables remained significantly associated with infant and child mortality after adjusting for the effects of the selected important characteristics, although some to a lesser degree. The result revealed that demographic factors were also more important in explaining infant mortality while socio-economic factors were more significant in influencing child mortality. It also indicated that Nigeria has substantial variations in the risks of infant and child mortality across the regions. The characteristics of the communities were important in explaining the observed variations in the regions showing that insufficient progress was made in infant and child mortality reduction over the periods studied (Adedin, 2013). Collison et al. (2007) established a very strong relationship between income inequality and child mortality even in wealthy nations.

NDHS (2013) revealed a variation in child mortality rate as children of mothers residing in the North-east had significantly higher risks of mortality compared to children in South-west Nigeria. Increased variations in the risks of infant and child death were observed across the six geopolitical zones in the nation. These findings recommended that policies to ensure a substantial reduction in infant and child mortality in the nation must include strategies and programmes that rectify characteristics of the community contexts which exacerbate infant and child mortality risks, especially in socially and economically disadvantaged communities and regions of the nation.

In the same vein, Smith-Greenaway (2013) clearly established a strong association between mothers' reading skills (a key subcomponent of broader literacy and language skills) and child mortality in a study to test the conditionality of the relationship between mothers' reading skills and child survival on mothers' decision-making power. Among Nigerian children whose mothers have decision making power, mothers' reading skills convey a 27 percent lower risk of child mortality; however, for children whose mothers lack decision-making power, mothers' reading skills do not yield a significant survival advantage. The findings support the need for future work to further analyse how broader social structures condition the benefits of mothers' reading skills for children's health. LeVine(2012) also supported that emerging evidence identified mothers' literacy skills as a key determinant of children's health and survival in low-income countries.

Oyefara (2013) examines the nexus between maternal age at first birth and level of childhood mortality within the socio-economic structure of Yoruba society in Nigeria, among 1,000 women from Osun State, Nigeria. The study showed a significant relationship between maternal age at first birth and childhood mortality level within the socio-demographic characteristics of women (such as place of residence, current age, occupational status, educational level, marital status, a form of marriage and number of children ever born). Specifically, women who had their first birth below age 20 years exhibit a significantly higher number of childhood mortality in comparison with women who had their first birth by age 20 years and above ($P < 0.01$), most especially when the latter were at similar categories to the former. Thus, age at first birth was identified as a strong determinant of relatively high childhood mortality

level. It is therefore imperative for the government to address and inhibit early age at first birth in order to reduce significantly the level of childhood mortality in Yoruba society of Nigeria.

Additionally, Bello and Joseph (2014) examined and identified some important determinants of infant and child mortality in Oyo State using 150 respondents discovered that poverty, malaria, postnatal care, health scheme, and breastfeeding were the major determinants of child mortality in the state and therefore advised that policies should be revised for proper implementation of health intervention programmes that focused on mothers and children's health. In addition, parents' economic conditions especially the father should be improved to encourage prolonged breastfeeding.

Hence, the global debate on infant and child mortality is endless. Despite several types of research conducted on infant and child mortality around the globe, the phenomenon still remains an issue for research and policy in the developing world. In order to contribute to the global discourse on infant and child mortality, this study attempts to build on the understanding of the individual and household-level determinants of child mortality provided in the reviewed literature. In addition, this study advances existing knowledge by taking advantage of the multilevel analytical technique to assess community specific determinant of child survival in South-west Nigeria. The effect of community-specific factors on child mortality and uptake of child survival interventions has seldom received attention in Nigeria. Hence, this study extends the frontier of knowledge by examining the influence of community-specific factors on the survival of under-five children and the uptake of child survival interventions in South-west Nigeria.

2.7 Preventive activities influencing Child Survival

The first five years are a crucial period in the development of a child, and this development directly affects the quality of adult life. Brain development is almost wholly completed by age 2 and malnutrition rates peak at around 24 months of age. This implies the need for early interventions to increase the likelihood of the child surviving. Growth monitoring – steady growth is a good sign of adequate nutrition,

Oral Rehydration Therapy (ORT) restores fluids lost to diarrhoea, Breastfeeding promotes infant growth, facilitates bonding with the mother, and reduces incidence of illness, Immunisation is an effective way to reduce or eliminate many diseases that cause childhood death and disability, Female Literacy is the mother's level of education is directly tied to child survival, Food refers to food or supplements that fight off malnourishment, Family Planning is the deliberate practice of controlling the timing and number of pregnancies in women.

This spacing between births allows the mother's body to be better prepared for the rigors of pregnancy and to provide greater attention to each child's needs (Sanusi & Gbadamosi, 2009). All these practices greatly influence the survival of under-five children. The practices or activities are summarised in the figure below:

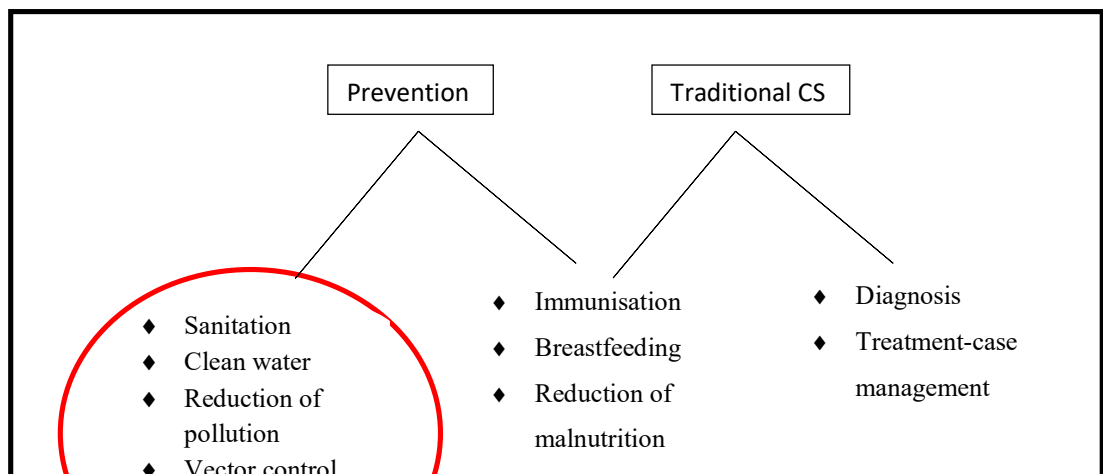


Figure 2.6: Range of Preventive Activities in Child Survival

Adapted from WHO, 2008; Favin et al. 1999

Adequate nutrition

Adequate nutrition during infancy and early childhood are essential to ensure the growth, health, and development of children to their full potential. It has been recognised worldwide that breastfeeding is beneficial for both the mother and child as breast milk is considered the best source of nutrition for an infant (Ku & Chow, 2010). The World Health Organisation recommends that infants be exclusively breastfed for the first six months, followed by breastfeeding along with complementary foods for up to two years of age or beyond (Hanif, 2011).

Exclusive breastfeeding can be defined as a practice whereby the infants receive only breast milk and not even water, other liquids, tea, herbal preparations, or food during the first six months of life, with the exception of vitamins, mineral supplements, or medicines. The major advantage of exclusive breastfeeding from 4 to 6 months includes reduced morbidity due to gastrointestinal infection. Proper breastfeeding practices are effective ways of reducing childhood morbidity and mortality (Ashmika et al., 2013). Furthermore, WHO (2015) stated that breast milk is the ideal nourishing formula/food for infants which should be fed to the infant within the first one hour of birth and sustained for six months. Following this, appropriate and adequate complementary foods should be introduced alongside breast milk for one year or more. According to health experts, breast milk is sufficient to meet the baby's

nutritional needs for the first six months without introduction or addition of water, drinks or any other foods (Nielsen et al., 2011; Jacdonmi et al., 2016).

Additionally, several benefits of breastfeeding were to stimulate the immune system of babies, protect them from acute respiratory infections, diarrhoea, urinary tract infections, necrotising enterocolitis, bacterial meningitis, sudden infant death syndrome, lymphoma among others. Breastfeeding also improves response to immunisation and secretory IgA antibodies passed to these babies through the intake of colostrum, the first milk produced for newborn babies. Apart from benefiting infants, breastfeeding creates a special bond between mothers and infants. It also helps to reduce the weight gained during pregnancy. For an infant, the mother produces adequate breast milk which takes care of nutritional needs. The breast milk is rich in carbohydrates, proteins, fats, minerals, and vitamins, whereas infant formula available as an alternative in the market may not have similar benefits (Jacdonmi et al., 2016). One of the most effective strategies for reducing infant morbidity and mortality in resource-limited settings (that is human and infrastructural constraints) is the promotion of exclusive breastfeeding (EBF) for the first 6 months of infant's life (Onah et al., 2014).

Ashmika et al. (2013) assessed breastfeeding pattern, infant formula feeding pattern, and weaning introduction in Mauritius and also investigated the factors that influence infant nutrition. They discovered that the prevalence of breastfeeding practice in Mauritius rose from 72% in 1991 to 93.4%, while only 17.9% breastfed their children exclusively for the first 6 months. Complementary feeding was more commonly initiated around 4 – 6 months (75.2%). Despite the fact that 60.6% of mothers initiated breastfeeding and 26.1% of mothers were found to breastfeed for up to 2 years, the practice of EBF for the first 6 months was still low (17.9%). Factors found to influence infant feeding practices in the study were the method of delivery, parity, alcohol consumption, occupation, education, and breast problems.

Saied et al. (2013) in a study among 340 Saudi Arabia mothers with a mean age of 31.4 (± 7.5) years reported statistically significant correlations between attitudes toward infant feeding and maternal age ($r = 0.33$) and the highly significant correlation between mother's knowledge and their attitude ($r = .71$). In the same vein Mogre et al. (2016) in a cross-sectional study conducted among 190 rural lactating mothers with

infants aged 0 – 6months in Ghana, revealed that the knowledge of EBF, child's age and maternal level of education were important determinants of the practice of EBF,thereby, recommended that beyond the dissemination of health messages, healthcare professionals should pay more counseling attention to less educated mothers, and also older children's caregivers.

Likewise,Oche et al.(2011) in a cross-sectional descriptive study involving 179 women of childbearing age (mother-child pairs) in Kware town of Sokoto State, reported that 31% of mothers in the study had adequate knowledge of exclusive breastfeeding with 53% of them initiating breastfeeding immediately after birth and only 31% of the mothers practised exclusive breastfeeding.

Mother's knowledge and attitudes towards exclusive breastfeeding as well as family pressures, maternal level of education, knowledge, attitude, socio-cultural tradition, maternal age, marital status, family income/social class, place of delivery, and time of initiation of first breastfeeding have been previously cited for low rate of EBF (NDHS, 2013; Onah et al. 2014). Breastfeeding is perhaps the oldest practice in human history. It is the healthiest, simplest and least expensive means of meeting the nutritional needs of newborns and infants. Breast milk contains all essential nutrients – carbohydrates, essential fats, proteins, minerals, and immunological factors–required for the optimal growth and development of infants, hence, it is the ideal meal for them (Ballard& Morrow, 2013).

Given the importance of breastfeeding, the World Health Organisation (WHO) adopted the Innocenti Declaration which emphasises the need to initiate breastfeeding within the first hour of delivery. The declaration further recommends exclusive breastfeeding for newborns up to the first six months of life, and that breastfeeding should continue for at least two years post-delivery. It equally recommends the introduction of safe, appropriate and adequate complementary foods starting from the age of six months (WHO, 2010). Several beneficial effects of short and long terms have been linked with appropriate breastfeeding practices in babies and their mothers (WHO, 2010).

Reduced incidence of respiratory tract infections, non-specific gastroenteritis, otitis media, atopic dermatitis,and childhood leukemia are some of the benefits of optimal

breastfeeding in infants. Breastfeeding improves motor and mental development in babies and protects them against conditions like diabetes (type 1 and 2), asthma, necrotising enterocolitis, Sudden Infant Death Syndrome (SIDS) and obesity. In mothers, breastfeeding reduces postpartum bleeding, enhances accelerated involution of the uterus and plays a crucial role in child spacing through lactational amenorrhea. Other maternal benefits of breastfeeding include reduced risks of osteoporosis, hip fracture, breast cancer, ovarian cancer, and type 2, diabetes (Victoria et al., 2015).

In Nigeria, almost all children are breastfed. However, the rate of exclusive breastfeeding is low and declining, from 28% in 1999 to 17% in 2013 (NDHS, 2013). The rate of breastfeeding initiation (38%) within the first hour of delivery is equally low (Ogboet al., 2015). These low rates of breastfeeding practices possibly contribute to the high burden of neonatal and infant mortality in the country. Evidence linking inappropriate breastfeeding practices with child morbidity and mortality lends credence to this position (Black et al., 2013).

Adewuyi and Adefemi (2016) in a systematic review of breastfeeding in Nigeria reported a declining trend in the rates of exclusive breastfeeding and an increasing trend in the mean duration of breastfeeding. The rate of any breastfeeding was high and breastfeeding duration varies across Nigeria, a possible reflection of differences in sociocultural practices. Among reasons cited for discontinuation of breastfeeding are maternal health problems and the demands of work. The review showed that even though breastfeeding was commonly practised in Nigeria, the rate of exclusive breastfeeding was low and declining.

Kumar et al. (2006) in their study on the influence of infant-feeding practices on the nutritional status of under-five children discovered that delayed initiation of breastfeeding, deprivation from colostrum, and improper weaning were significant risk factors for under-nutrition among under-five children. Similarly, Dipen et al. (2015) in their study on breastfeeding practices, demographic variables, and their association with morbidities in children, found out that initiation of breastfeeding after an hour of birth ($p = 0.035$), not providing exclusive breastfeeding for 6 months ($p < 0.0001$), unemployment among mothers ($p = 0.035$), having two or more kids ($p = 0.001$), and complementary feeding given by person other than mother ($p = 0.007$) increased hospitalisation. Starting breastfeeding after an hour of birth ($p = 0.045$), severe

malnutrition ($p = 0.018$), and breastfeeding for $< two years$ ($p = 0.026$) increased rates of diarrhoea. Therefore they posited that breastfeeding practices were not optimum and interventions to improve these practices should be strengthened.

In addition, Aigbokhaode et al. (2015) in a descriptive cross-sectional study on health-seeking behaviour among 370 caregivers of under-five children with a mean age of 31.1 ± 5.9 years in Edo State, Nigeria, showed poor health seeking practices among the caregivers of under-five children. The study revealed that cost and long waiting time were the major reasons for not seeking care in health facilities. They concluded by recommending continuous education for caregivers on recognition of danger signs in children and the need to seek appropriate medical care in health facilities.

Malnutrition or illness can be detected early through growth monitoring and promotion which foster good development in children (UNICEF, 2001). Poor sanitary practices have been suggested as reasons why diarrhoeal diseases and consequent dehydration were so common in Nigeria. Female literacy is a non-health factor that influences child survival and better nourishment of children. Furthermore, childhood immunisation remains an important strategy in the reduction of morbidity and mortality from common vaccine-preventable diseases which have been implicated in the death of more than 20% of children under the age of five (CDC, 2002). Persistent high under-five mortality, therefore, suggests either a lack of knowledge or practice of child survival strategies by mothers and caregivers.

Sanusi and Gbadamosi (2009) in a descriptive cross-sectional study of 240 nursing mothers and their children attending well-baby clinics in Ibadan showed that exclusive breastfeeding was practised by 67.5%, oral rehydration therapy by 78.3%, growth monitoring and promotion by 7.5%. Timely and complete immunisation was practised by 93.8% for BCG, 80.4% for one dose, 60.4% for two doses and 49.2% for three doses of DPT and oral polio vaccines, 53.8% for measles and 12.1% for hepatitis B. Family planning methods were used by 55% of the mothers. Sixty-three percent of the children were underweight, 68% were stunted and 23% were wasted.

The study revealed that there was no significant relationship between mothers' practice of CSS and nutrition of the children. The educational level of the mothers was negatively correlated with 'wasting' among the children thereby, reaffirmed the

importance of female education in the practice of CSS and good nutritional outcomes of children. They recommended that basic knowledge of child health, nutrition, and related issues should continue to be made available to women and be included in school curricula. The practice of all the CSS components should be encouraged even at the community level (Sanusi & Gbadamosi, 2009).

Senbanjo et al. (2016) also assessed dietary practices and nutritional status of under-five children in rural and urban communities of Lagos State, Nigeria. They reported that prevalence of underweight and stunting among children was significantly higher in rural than urban communities (19.4% vs. 9.3% and 43.3% vs. 12.6%, at $P < 0.001$, respectively) in Lagos State. Furthermore, they reported that exclusive breastfeeding rates for 6 months (25.3% vs. 28.7%; $P = 0.516$), use of formula feeds (48.7% vs. 44%; $P = 0.077$), and mean age of child at the introduction of semisolid foods (7.54 ± 4.0 months vs. 8.51 ± 7.3 months; $P = 0.117$) were not significantly different between urban and rural communities. The diversity of food choices and frequencies of consumption were similar between urban and rural communities.

Hand washing

Hand washing is the act of cleansing the hands with water or another liquid with or without soap or other detergents for the sanitary purpose of removing soil and/or micro-organisms. The practice of hand washing is about as old as man. It was an important practice held by the Jews who ensured that hand washing preceded eating. Good hand washing involves the vigorous, brief rubbing together of all surfaces of lathered hands, followed by rinsing under a stream of water. Hand washing suspends microorganisms and mechanically removes them by rinsing with water. Therefore, the fundamental principle of hand washing is removal, not killing (CDC, 2009).

Some critical times at which hand-washing must be employed include after using the toilet, changing diapers, attending to a sick person, handling raw meat, fish or poultry, after handling garbage, treating a wound or cut, contact with domestic animals, before food preparation and before eating (CDC, 2009). A great number of diseases can be transmitted from lack of or ineffective hand washing, particularly feco-orally transmitted diseases, ranging from self-limiting infections like diarrhoea (Rotaviruses are major causes of diarrhoea diseases in human infants) to potentially life-threatening

diseases like poliomyelitis and hepatitis A virus infection (Blacket al., 2003). Hygienic measures, including hand washing with soap before meals and after use of restrooms, have been found to prevent hepatitis A virus infection (WHO, 2012).

Hand washing, if regularly and properly practiced by mothers of children of under-5 years old will go a long way in reducing the prevalence of infectious diseases, hospital admissions due to these diseases and also mortality among the under-5 years' old children, thus making them grow well and healthy (Curtis & Cairncross, 2003). In Nigeria, the diarrhoeaprevalence rate is 18.8%; this is one of the worst in Sub-Sahara Africa and above the average of 16%. Diarrhoea accounts for over 16% of child deaths in Nigeria and an estimated 150,000 deaths mainly amongst children under five occur annually due to this disease mainly caused by poor sanitation and hygiene practices (Limlim, 2008). Hand washing with soap and water is one of the most effective measures against infectious diseases (Aigbiremolen et al., 2015).

Asekun-Olarinmoye et al. (2014) in a community-based cross sectional study set out to determine the knowledge, attitude and practice of hand washing among 300 mothers of under-five children in Igbona area of Olorunda Local Government in Osogbo, Osun State, Nigeria reported good knowledge of hand washing among the respondents. Education and religion influenced the degree of knowledge of hand washing (higher education and Christianity positively impacted knowledge of hand washing) in the study. More than three-quarters (81.6%) of them did not think that the use of soap was important in hand washing. Respondents' practice of hand washing was influenced by their age and educational level.

Aigbiremolen et al. (2015) assessed the knowledge and practice of hand washing by 513 mothers and caregivers of children less than five years with a view to recommending ways of enhancing the practice in rural communities. The mean age of the mothers interviewed was 31.6 (± 9.2) years. Over two-thirds (70.6%) of them had good knowledge of hand washing. Fifty-six percent reported regular washing of hands at critical moments; hand washing was highest after defecation (79.6%). There was no statistically significant relationship between the knowledge and practice of hand washing ($df=1$, $X^2 = 2.796$, $p = 0.094$). The commonest reasons that were given for not washing hands regularly were being too busy (19%) and non-availability of soaps (17.7%) and water (13.5%). The findings showed that though there was a gap between

knowledge and practice of hand washing, it was not statistically significant; indicating that other factors beyond knowledge may be responsible for poor hand washing behaviour (Aigbiremolen et al., 2015).

The practice is safe, cheap and not time consuming. Hand washing could be effectively adopted by any socioeconomic class and by any community. The practice of hand washing is also culture-sensitive and is generally acceptable across many population groups. A consistent practice of proper handwashing with soap and water has the great potential of keeping a family, especially, mothers and children, away from germs and hence ill health. The hands are about the most important human anatomical structures that man uses to interact with his environment. This interaction transcends virtually all aspects of the environment: hands are used to lift objects; they are used to touch pets and plants in the biological environments, and also used for social actions like shaking of hands, petting and hugging. Mothers and other caregivers are engaged in these interactions and more particularly with respect to catering for their under-five children. Inadvertently, their hands pick up micro-organisms and other materials that may be harmful to children. In general, 'critical moments' for hand washing include after using the toilet, cleaning a child up following defecation, before preparing food and before eating (Water Supply and Sanitation Collaborative Council,2015).

Other times when hand washing is important are after changing diapers, attending to a sick person, handling raw meat, fish or poultry, after handling garbage, treating a wound or cut, contact with domestic animals, before preparation and eating of food. In caring for children, especially those less than five years old, there are some peculiar aspects such as handling diapers, disposing of faeces and urine, and extracting mucus that introduce harmful organisms into mothers' hands. Thus, there is a high possibility of infecting the child and transmitting infections to other members of the household when hand hygiene is not maintained. In rural communities, there are other factors that determine the extent to which the practice of hand washing is promoted and adhered to. Such factors range from the availability of water to cultural perceptions of when and how often hands should be washed (WHO, 2012)

Management of childhood illnesses

WHO(2012), stated that the leading causes of death in under-five children were pneumonia, preterm birth complications, diarrhoea, birth asphyxia, and malaria. Specifically, from the end of the neonatal period and through the first five years of life, the main causes of deaths are pneumonia, diarrhoea, and malaria. Malnutrition has been stated as the underlying contributing factor in over one-third of all child deaths making children more vulnerable to severe diseases (WHO, 2012). In Nigeria, the majority of deaths 73.5 percent in children under-five years of age in the country occurred in age two years and below, with a peak in the age group, 7-12 months. It was further revealed that out of 101 children with respiratory symptoms of less than 28 days duration, 52 had radiological pneumonia; 42 of them were less than three years (Osuala, 2011).

Diarrhoea is the second leading cause of death in children under five years old, and is responsible for killing around 760, 000 children every year (WHO, 2013). Amare et al.(2014) assessed attitude of mothers towards diarrhoea management and prevention in under five children, in Fenote Selam Town, West Gojjam Zone, Amhara, Northwest Ethiopia, 2014 among 846 mothers who had under five children posited in a community based cross-sectional study design that about half 416(50.1%) of mothers had a favorable attitude towards diarrhoea management and prevention. Amare et al.(2014)in another report assessed maternal knowledge and practice towards diarrhoea management in under five children posited that 63.6% of mothers in the study had good knowledge towards diarrhoea management while 54.1% of mothers had poor practice on diarrhoea management.

Global Action Plan (2013) stated that malnourished children were nine times more likely to die from infectious diseases such as pneumonia, diarrhoea, malaria, and measles. A child coping with such diseases will find it difficult to retain essential nutrients, putting the child at risk of falling into a dangerous state of malnutrition. For example, repeated bouts of diarrhoea can disrupt the intestinal absorptive and barrier functions of the gut – the cause of up to 43% of stunted growth affecting one-fifth of children worldwide and one-third of children in developing countries. “Children that were poor, hungry and living in remote areas were most likely to be visited by “forgotten killers” pneumonia and diarrhoea” (Global Action Plan, 2013). Under-nutrition is also a consequence of repeated bouts of illness. Recent findings in Brazil,

for instance, demonstrate a bi-directional relationship between nutritional status and the duration of diarrhoeal illness, where a loss of zinc through diarrhoea can leave a child prone to further infection, prolonging the diarrhoea and further reducing nutritional intake (Guerrant et al., 2013).

Immunisation

Abedi and Srivastava (2012) assessed the immunisation and nutrition status of 402 children under-5 years of age in a cross-sectional community-based field study conducted in urban and rural Lucknow, Uttar Pradesh, India. They reported that 43.8% of the children were fully immunised, 41.8% and 14.4% of children were partially immunised and not immunised respectively. The most common form of malnutrition was stunting (51.4%), followed by underweight children (43.5%) and wasting (21.7%). It was observed that fully immunised children had better nutrition status. A significant association was found between the immunisation status of the pre-school child and underweight ($p < 0.005$). The study indicated that majority of children were malnourished and most of them were not immunised, thus suggesting that childhood vaccination in addition to being a major intervention for reducing child mortality might be considered a tool for mitigating under nutrition.

Berendsen et al. (2016) evaluated the effect of the timing of BCG and other vaccinations, on stunting in Sub-Saharan African (SSA) children under age five, using 368,450 children from 33 SSA countries. Logistic regression analysis was used with control factors at the child, mother, household, and context level. BCG vaccination did not affect stunting in SSA children (OR 1.00 [0.98–1.03]) however BCG was associated with lower odds on stunting for children vaccinated early in life (OR 0.92 [0.89–0.94]) and higher odds for children vaccinated later in infancy (OR 1.64 [1.53–1.76]). Similar findings were done for diphtheria-tetanus-pertussis (DPT)1 and measles vaccination, and when hemoglobin concentration was used as the outcome variable. A general time-dependent pattern of non-specific effects of vaccination, with positive associations for vaccinations that were given early in life and negative associations for vaccinations that were given later in infancy, was discovered. They recommended further research work to be conducted to confirm their findings, as this may provide a new perspective on the non-specific effects of vaccination.

Live attenuated vaccines, such as Bacillus Calmette-Guérin (BCG), possess beneficial non-specific effects outside the scope of their target disease that have been associated with lower mortality rates (WHO, 2014a; Nankabirwa et al., 2015). Vaccination with BCG increases immune responses and protects against unrelated pathogens (Jensen et al., 2015). The general immune modulatory and antimicrobial effects of BCG may also affect stunting. Stunting reflects a failure to reach linear growth potential in the early years of life and has a highly multifactorial etiology that includes nutritional factors, infectious diseases, and socio-economic factors (Prendergast & Humphrey, 2014). In addition to wasting of nutrients, infection-related inflammation could lead to stunting through down-regulation of insulin-like growth factor 1 (IGF-1) expression (Prendergast & Humphrey, 2014).

Stunting affects approximately 165 million children under age five, many of whom live in Africa (36.5%) where stunting rates in many areas are over 40% (Global Data Lab, 2016). The beneficial non-specific effects of BCG suggest that this vaccine may be used to reduce stunting in low and middle-income countries. If BCG vaccination indeed reduces stunting, there would be substantial potential for improvement, as coverage of BCG vaccination has stalled at 77–85% in Africa since 2009 (WHO, 2014b). Apart from vaccination coverage, the timing of vaccination may be important, as the child's immune function changes with age (Kollmann et al., 2012)

Aniekan and Ofonime (2016) in a study on child survival strategies: assessment of knowledge and practice of rural women of reproductive age in Cross River State, Nigeria discovered that the child survival strategy known to most of the respondents was oral rehydration therapy as indicated by 98% followed by female education by 73.3% and immunisation by 67.3%. Only 20% of the respondents had adequate knowledge of the frequency of weighing a child while only 32.7% knew that breastfeeding should be continued even if the child had diarrhoea. More respondents with non-formal education (83.3%) practised exclusive breastfeeding of their last children compared to respondents with primary education (77.3%), secondary education (74.2%), and tertiary education (72.2%). They concluded that although respondents demonstrated adequate knowledge and practice of most of the strategies, there was evidence of gaps, including myths and misconceptions that could mar efforts towards reducing child morbidity and mortality in the state.

Sobo et al. (2016) assessed the knowledge and practice of mothers on child survival strategies in Odeda Local Government Area, Ogun State, Nigeria and reported that 26% of mothers in the study had adequate knowledge on child survival strategies while about 10% had poor knowledge. About 17.6% of the mothers practised child survival strategies adequately while about 55% had poor practices. Only 10.5% of the mothers know and use zinc tablet in the management of diarrhoea. They also reported a significant relationship between knowledge and practice of child survival strategies among the mothers. The educational level of mothers significantly affects the practice of child survival strategies. They concluded that the knowledge and practice of the mothers on the use of zinc tablet, exclusive breastfeeding, GMP and vaccination were poor.

2.8: Behaviour Change Communication

Behaviour change communication (BCC) is defined as the strategic use of communication to promote positive health outcomes which are based on proven theories and models of behaviour change. It involves a series of steps which must be followed in a systematic way to achieve the best results. These steps include formative research and behaviour analysis, target group segmentation, formulation of behavioural objectives, communication, planning, and implementation, material development and pre-testing, monitoring and evaluation (Measure Evaluation, 2016).

BCC is a participatory process for encouraging positive health behaviour change in individuals and communities through the strategic application of targeted messages, and the provision of a supportive environment (Briscoe & Aboud, 2012).

Behaviour change communication is about changing specific behaviours – well-defined actions at the household, community and health service levels. The approach recognises that behaviour change is more about identifying the causes and barriers to change in behaviour and overcoming the barriers.

It is about understanding the communities, contexts, and environments in which behaviours occur and using persuasive techniques to demand health rights and to make public sector health services available and accessible to the neediest. It involves the integration of new practices into long-standing social, cultural and communication system (National Rural Health Mission, 2010). Health information and the channels

that facilitate the flow and exchange of this information to and among health care providers are key elements of a strong health system that offers high-quality services, thus contributing to improved health outcomes (Kapadia-Kundu et al., 2012; Horton, 2000). Behaviour change communication has its roots in behaviour change theories which were drawn upon various models and theories to design effective programmes and activities that have evolved over the past several decades. These theories provide a valuable foundation for developing comprehensive communication strategies for providing behavioural change interventions.

SSH (2016) defined BCC as an interactive process with communities (as integrated with an overall programme) to develop tailored messages and approaches using a variety of communication channels to develop positive behaviours, promote and sustain individual, community and societal behaviour change, and maintain appropriate behaviours. It is an approach that uses an in-depth understanding of people's behaviour to design persuasive communication through interpersonal communication, distribution of materials, display of materials, radio, television, large gatherings, small groups, short message service (SMS) and phone conversation (SSH, 2016). Adewuyi and Adefemi (2016) stated that health behaviour change can be communicated using channels such as radio, television, videos, and SMS. Benetoli, et al. (2015) further added that with the exponential growth in internet-based communication, social media has emerged as one of the preferred participatory means of communication which provide opportunities for interactive engagement.

INFO Project (2008) also defined BCC as an interactive process of any intervention with individuals, communities and/or societies (as integrated with an overall programme) to develop communication strategies to promote positive behaviours which are appropriate to their settings. This, in turn, provides a supportive environment which will enable people to initiate, sustain and maintain positive and desirable behaviour outcomes. Behavioural change communication is a process that motivates people to adopt and sustain healthy behaviours and lifestyles. Sustaining healthy behaviour usually requires a continuing investment in BCC as part of an overall health programme. It is the strategic use of communication to promote positive health outcomes, based on proven theories and models of behaviour change.

Behavioural change communication employs a systematic process beginning with formative research and behaviour analysis, followed by communication planning, implementation, and monitoring and evaluation. Audiences are carefully segmented, messages and materials are pre-tested, and mass media (which include radio, television, billboards, print material, and internet), interpersonal channels (such as client-provider interaction, group presentations) and community mobilisation are used to achieve defined behavioural objectives (Measure Evaluation, 2016).

Behaviour Change Communication (BCC) programmes are designed to bring about behaviours that will improve health status and related long-term outcomes. The programmes include a wide range of interventions that fall into three broad categories:

- Mass media (radio, television, billboards, print material, the internet);
- Interpersonal communication (client-provider interaction, group presentations); and
- Community mobilisation.

Any of these three types of communication can be used to generate the results measured by core indicators, including change in knowledge, attitudes, intentions, and behaviour (Measure Evaluation, 2016):

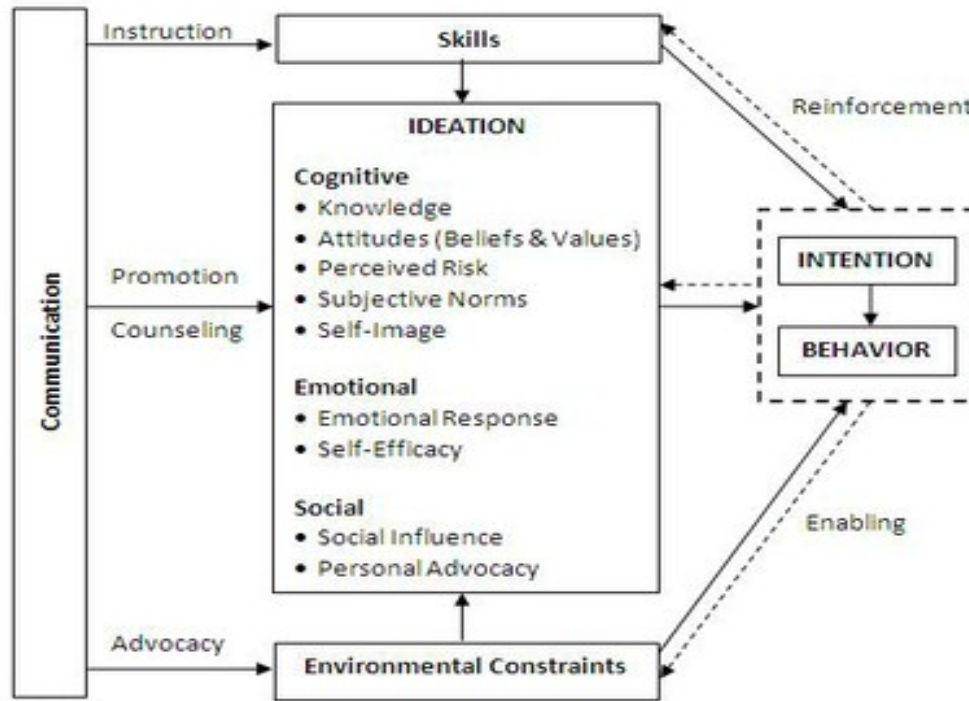


Figure 2.7: The Conceptual Framework: How BCC Works

Adapted from Measure Evaluation (2016)

In this conceptual framework of strategic behaviour change communication, communication is treated as an outside factor that affects the other variables in the model. Communication designed to improve skills is identified as instruction, communication for removing environmental constraints is identified as advocacy, and communication designed to change ideational factors is identified as a promotion. The model specifies how and why communication affects intention and behaviour indirectly through its effects on skills, ideation, and environmental constraints. Promotion is central to this section because it leads to ideational change (that is, a change in the way individuals or populations perceive given practices or behaviours). Promotion is designed to have cognitive, emotional, and social effects, which in turn influence a person's intent to practise certain behaviour and to follow through in doing so. The actual behaviour is the "desired result".

Communication is designed to affect ideational variables in order to change behaviour. In a pre-post evaluation design, the baseline measures of these variables were compared with post-intervention data. Also, they can assess programme effects on the ideational variables by comparing the level of each variable among those

exposed and unexposed to the communication programme. Evaluators can then use results on the relationship between ideational variables and programme exposure to track changes over time and refine and/or reinforce the communication messages. Research has shown that ideational variables operate as "proximate determinants" and that communication can influence the health outcome not only directly, but also indirectly through ideation (Measure Evaluation, 2016). Even if one can convince individuals that certain courses of action are desirable, environmental constraints to behaviour change often exist in the form of politically based barriers, resource limitations, legal constraints, and other factors. Advocacy becomes a powerful tool to confront these constraints at the macro level and to minimise barriers to positive behaviour at the individual level.

Providing people with information and teaching them how they should behave do not lead to a desirable change in their response/behaviour. However, when there is a supportive environment with information and communication (teaching) then there is a desirable change in the behaviour of the target group. Thus, BCC is proved to be an instructional intervention which has a close interface with education and communication. It is a strategic and group-oriented form of communication to perceive the desired change in the behaviour of the target group. It is the comprehensive process in which one passes through the following stages:

Unaware > Aware > Concerned > Knowledgeable > Motivated to change > Practicing trial behaviour change > Sustained behaviour change.

BCC is a strategy for obtaining and maintaining healthy behaviour at the individual, community and national levels.

- Individual-level focuses on individual health behaviour: birth spacing, breastfeeding, hand washing, appropriate nutrition, oral rehydration in case of diarrhoea, birth preparedness plans for delivery, antenatal and postnatal care, child health, (provision of) contraceptives and obstetric care and so on.
- Household and community level: power relations, social status, cultural values, and economic priorities may determine health practices, as well as the (perceived) accessibility of services and availability of goods.

- National level: Lobby & advocacy strategies on a national level affect individual health behaviour. National decisions to improve health infrastructure, health policies and making sufficient qualified health staff available have a great influence on improving and maintaining individual health behaviour.

Onwunaka et al.(2015) in a study conducted in order to identify the family and community practices (FCPs) for child survival, growth and development (SGD) among mothers in Enugu Stateshowed that mothers adopted FCPs except for hygiene and use of insecticide treated bed netsto a great extent.Based on their findings, they recommended that appropriate information, education, and communication (IEC) messages for promoting FCPs be carried out on mothers by health workers, including health education teachers, to ensure survival, healthy growth and development of the child.

This research work is focused on improving family and community practices that influence the survival of under-five children in South-west Nigeria. This focus is the third component of the integrated management of childhood illnesses (IMCI) strategies.

The three main components of IMCI strategy are:

- Improvement in the case management skills of health staff through the provision of locally adapted guidelines on IMCI and activities to promote their use;
- Improvement in the health system required for effective management of childhood illness;
- Improvement in family and community practices.

All three components encompass curative, disease prevention and health promotion activities. Despite all the improvements made in the first two components of IMCI indicated above, it was observed that a significant reduction in child morbidity and mortality was not achieved. In other words, the purposes of the two components were not satisfactorily achieved and hence, the need for an alternative approach was suggested (WHO & UNICEF, 1998).Belliet al. (2005) noted that the use of several

cost-effective interventions that can significantly reduce morbidity and mortality among children, in Nigeria was largely insufficient.

According to Hill et al. (2004), families have the major responsibility for caring for their children. They suggested that success in child survival programmes requires a partnership between health workers and families, with support from their communities. This implies that the child care approach should form an integrated whole suggesting that implementation is more of health worker, family, and community-based. The above means that the care being referred to goes beyond the actual health facility setting to include every other agent of the environment the child lives in.

2.8.1: Theories

BCC has several levels at which it can be implemented. Each level includes several theories, and each theory employs specific communication channels. The individual level includes the health belief theory, theory of reasoned action and planned behaviour, stages of change and social learning. Community level: diffusion of innovations theory and community mobilisation. Change in organisations level: the stage of change and public policy level: distinct stages of initiation, action, implementation, evaluation, and re-formulation.

The intervention provided in this research work was based on the Theories of Individual Behaviour and Behaviour Change, which is made up of three models: Theory of Planned Behaviour (TPB) and Theory of Reasoned Action, The Health Belief Model (HBM) and Stages of Change (Transtheoretical Model). However, this study was based on two of the models (TPB and HBM).

2.8.1.1: The Theory of Planned Behaviour (TPB) & Theory of Reasoned Action

The Theory of Planned Behaviour (TPB) and Theory of Reasoned Action is one closely inter-related family of theories which adopt a cognitive approach to explaining behaviour that centres on individuals' attitudes and beliefs (Ajzen, 1991). The TPB evolved from the theory of reasoned action (Fishbein & Ajzen, 1975) which posited the intention to act as the best predictor of behaviour. The intention is the outcome of the combination of attitudes toward behaviour, that is the positive or negative

evaluation of behaviour, its expected outcomes, and subjective norms, which are the social pressures exerted on an individual resulting from their perceptions of what others think they should do and their inclination to comply with it. The TPB added the third set of factors as affecting intention (behaviour); perceived behavioural control. This is the perceived ease or difficulty with which the individual will be able to perform or carry out the behaviour, and is very similar to notions of self-efficacy (Bandura, 1997; Terry et al., 1993; Munro et al., 2007; Nisbet & Gick 2008; Webb et al., 2010).

The key components of the TPB are illustrated in Figure 2.8. The TPB is suited to predicting behaviour and retrospective analysis of behaviour. It has been particularly widely used in relation to health (Taylor et al., 2007). Evidence suggests that the TPB can predict 20 – 30% of the variance in behaviour brought about by interventions, and a greater proportion of intention. Strong correlations are reported between behaviour and both attitudes towards the behaviour and perceived behavioural control components of the theory. To date, only weak correlations have been established between are and subjective norms. Armitage and Conner (2001), however, suggested that the issue was most likely to be methodological and stated that the few studies which measured subjective norms appropriately actually illustrate reasonably strong relationships with behaviour. The theory is a useful method for identifying particular influences on behaviour that could be targeted for change. According to Hardeman et al. (2002) even when authors use the TPB to develop parts of the intervention, they seem to see the theory as more useful in identifying cognitive targets for change than in offering suggestions on how these cognitions might be changed.

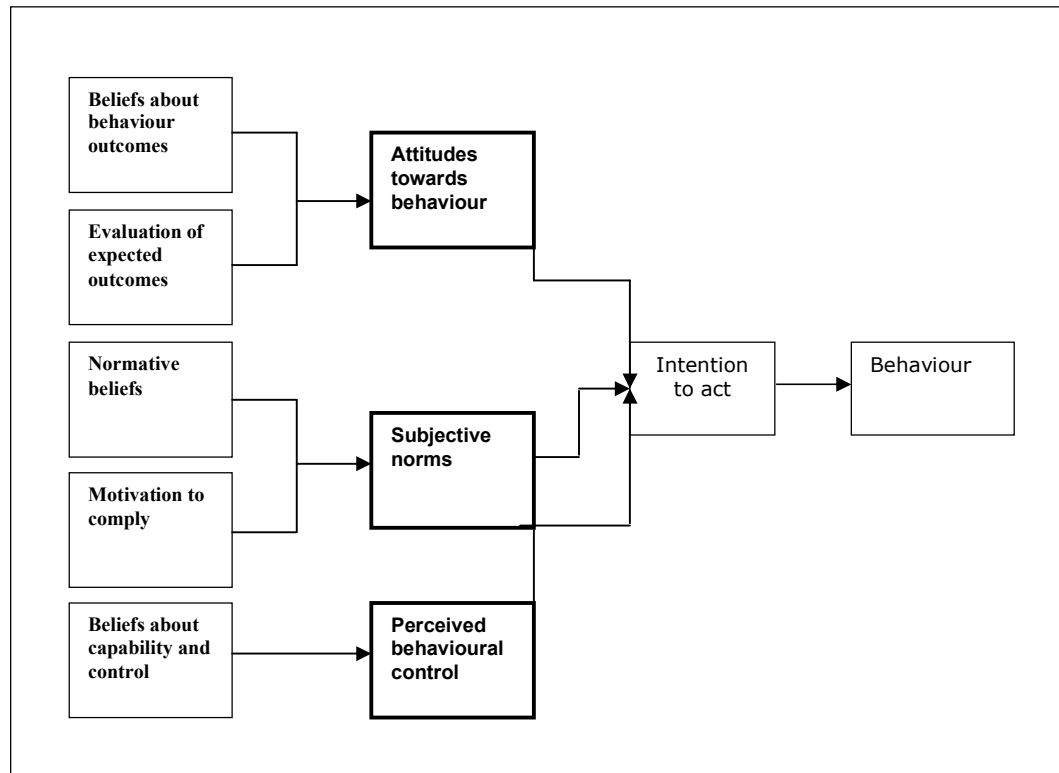


Figure 2.8: The Theory of Planned Behaviour (adapted from Munro et al., 2007)

2.8.1.2: The Health Belief Model

The health belief model (HBM) (Sharma & Romas, 2012) is a cognitive model which posits that behaviour is determined by a number of beliefs about threats to an individual’s well-being and the effectiveness and outcomes of particular actions or behaviours. Some constructions of the model feature the concept of self-efficacy (Bandura, 1997) alongside these beliefs about actions. These beliefs are further supplemented by additional stimuli referred to as ‘cues to action’ which trigger actual adoption of behaviour. The perceived threat is at the core of the HBM as it is linked to a person’s ‘readiness’ to take action.

It consists of two sets of beliefs about an individual’s perceived susceptibility or vulnerability to a particular threat and the seriousness of the expected consequences that may result from it. The perceived benefits associated with a behaviour, that is its likely effectiveness in reducing the threat, are weighed against the perceived costs of

any negative consequences that may result from it (perceived barriers), such as the side effects of treatment, to establish the overall extent to which a behaviour is beneficial. The individual's perceived capacity to adopt the behaviour (their self-efficacy) is a further key component of the model. Finally, the HBM identifies two types of 'cue to action'; internal, which includes symptoms of ill health, and external, which includes media campaigns or the receipt of other information.

These cues affect the perception of threat and can trigger or maintain behaviour. Nisbet and Gick (2008) summarise the model as follows: 'in order for behaviour to change, people must feel personally vulnerable to a health threat, view the possible consequences as severe, and see that taking action is likely to either prevent or reduce the risk at an acceptable cost with few barriers. In addition, a person must feel competent (have self-efficacy) to execute and maintain a new behaviour. Some trigger, either internal or external is required to ensure actual behaviour ensues (Munro et al., 2007; Nisbet & Gick 2008; Webb et al., 2010).

Jackson (2005) explains that HBM is limited – it pays insufficient attention to the social norms and expectations that govern human choice and to the habitual and routine nature of much human behaviour. It also fails to recognise how consumers are locked into specific behaviour patterns through institutional factors outside their control. The main elements of the HBM are illustrated in Figure 2.9.

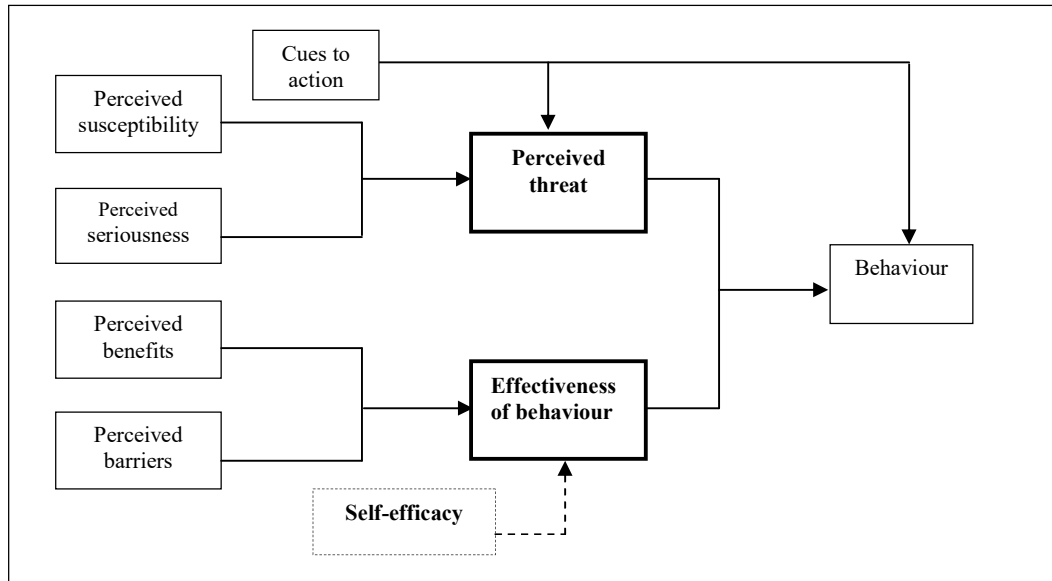
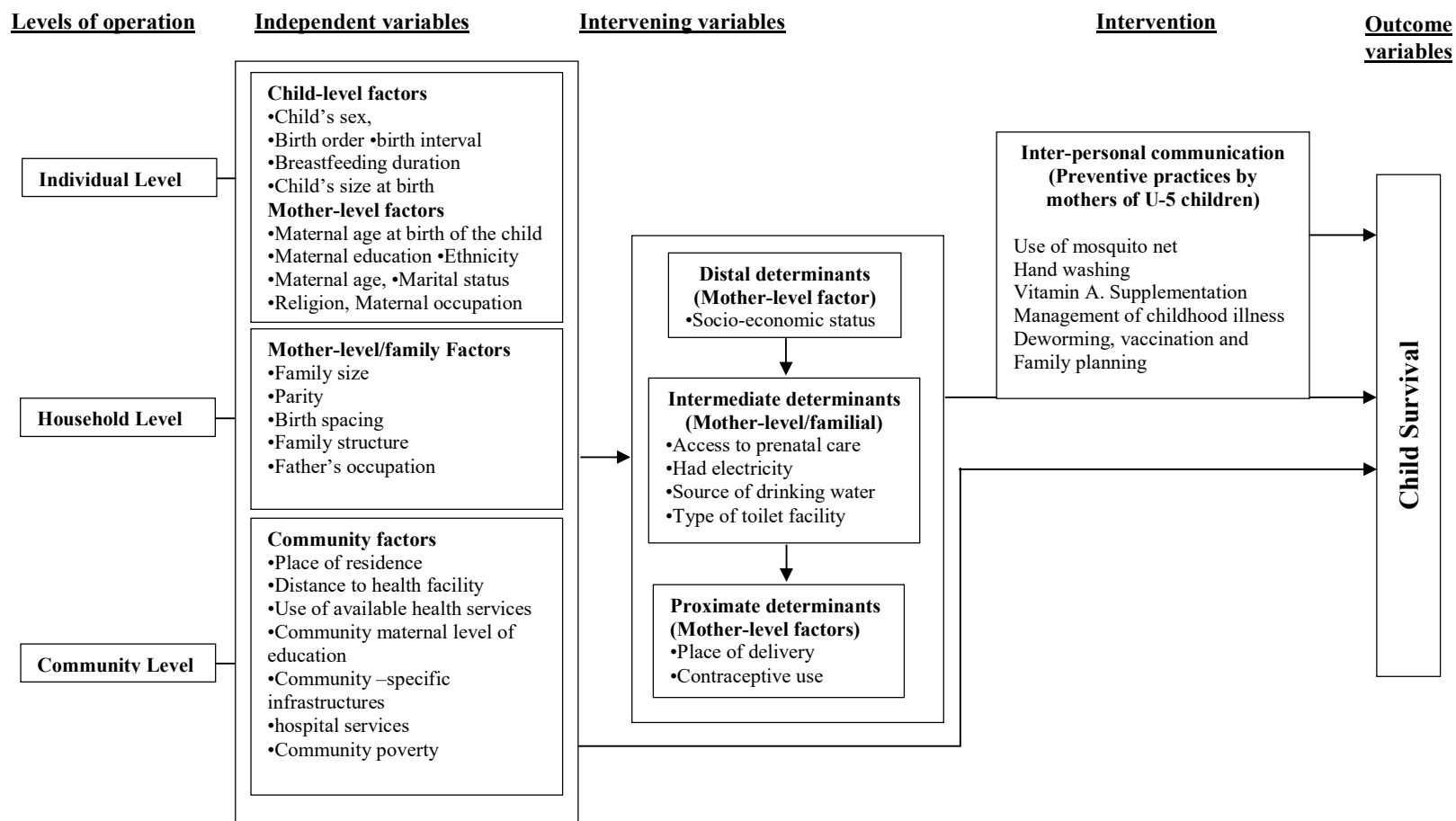


Figure 2.9: The Health Belief Model



(Guided by Mosley & Chen, 1984; Desta 2011 frameworks)

Figure 2.10: Conceptual framework for the study

CHAPTER THREE

METHODOLOGY

3.0. Introduction

This study was conducted to evaluate the effects of behavioural change communication on child survival practices among mothers of under-five children in Southwestern, Nigeria. Focus group discussion (FGD) was conducted at the beginning of the study to explore the perceived benefit and limitation to the uptake of child survival intervention in the communities. The findings from the FGD conducted were used in adapting the questionnaire for collecting data and the communication guide for giving the behavioural change communication (intervention) to the mothers of the under-five children recruited for the study.

3.1. Study Design

The study employed a randomized cluster sampling design and was carried out in three phases: pre-intervention (baseline), intervention and post-intervention phases. Randomised cluster sampling was used to randomly assign the communities within the LGAs to intervention and control communities. Individuals were classified into intervention and control groups based on the community they lived in. This procedure was adopted in order to avoid a situation where the control group was also exposed to the BCC intervention given to mothers in the experimental group.

3.2. Study location

The study was conducted in three states (Ekiti, Oyo, and Ogun) in South-west Nigeria. Two Local Government Areas (LGAs) were sampled from each of the state using a simple random sampling technique.

- Ekiti – Oye and Ado LGAs
- Oyo – Afijio and Ibadan North LGAs

➤ Ogun – Odeda and Abeokuta South LGAs

Three (3) communities were sampled from each of the LGAs using a simple random sampling technique.

3.3 Study Population

Under-five children (6-59months) and their mothers (mother-child peer) were included in the study at baseline if they had records of treatment or of receiving child survival interventions such as newborn care, immunisation, vitamin A supplementation and management of childhood illness (diarrhoea, pneumonia, malaria, and so on) during maternal newborn and child health weeks, immunisation campaigns and outreach programmes or during routine immunisation and management of sick children. Respondents were randomly allocated to control and experimental groups after the baseline data were collected. The experimental group was exposed to behavioural change communication which was meant to improve child survival practices among the mothers recruited. Where there were two under-five children, the younger was sampled. The sample frame for each local government was based on the total population of under-5 children in that LGA (NPC, 2006).

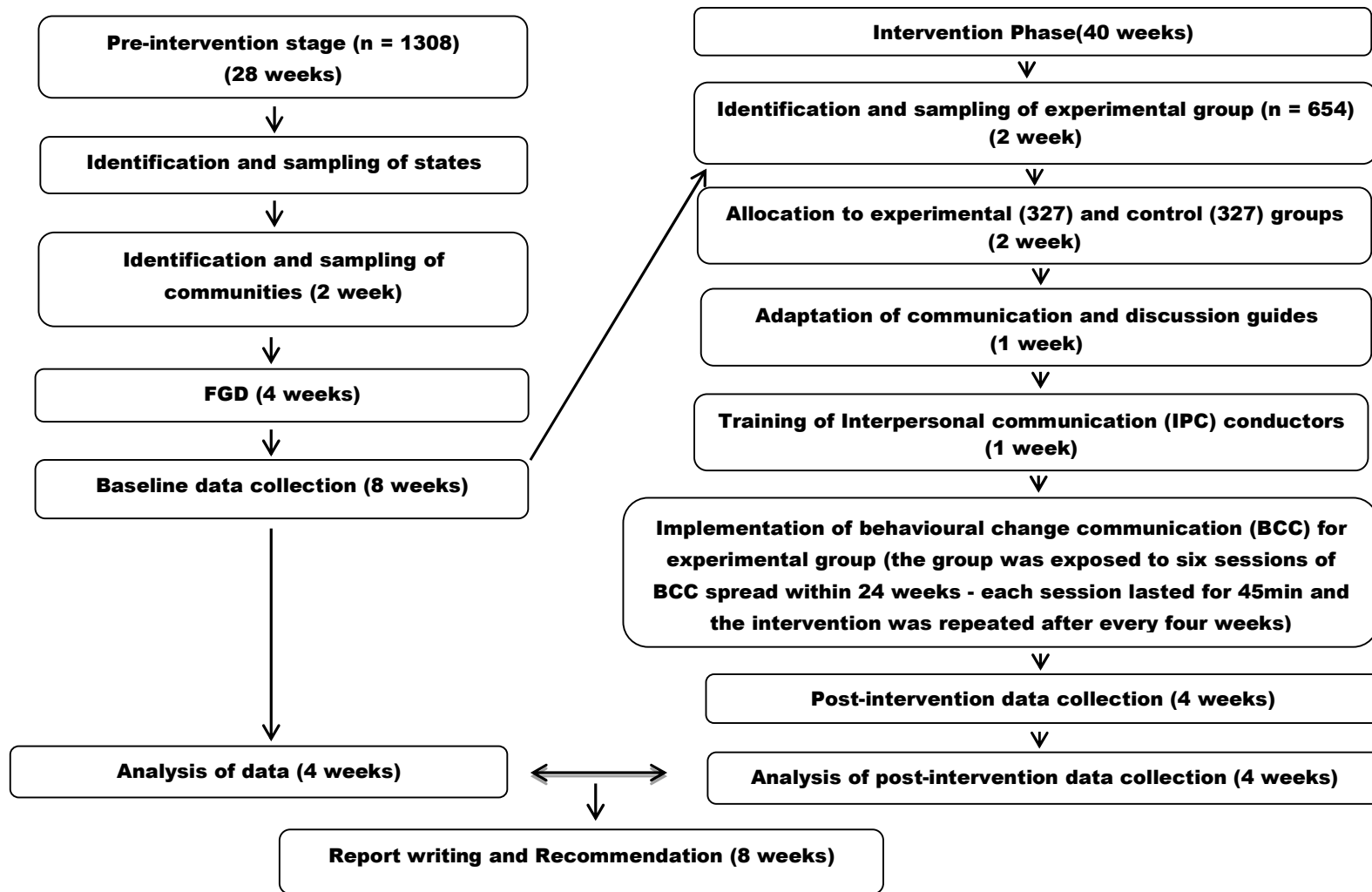


Fig. 3.1 Schedule for the study design

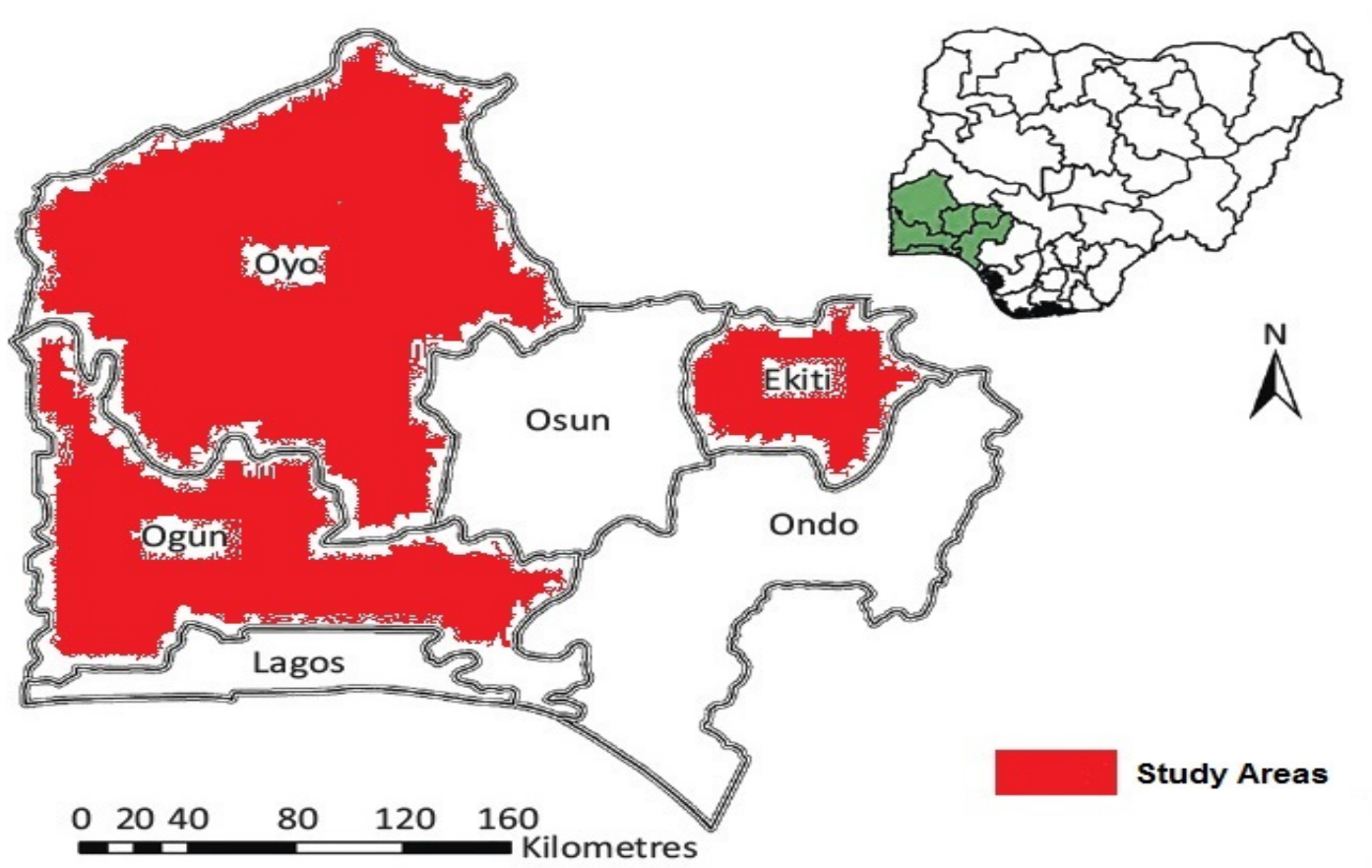


Fig. 3.2: Map of Southwestern Nigeria showing study areas

3.4 Sample Size determination:

The sample size for the study was determined using Kasiulevicius et al.(2006) method.

Using this sample size formula, the sample size was calculated as:

$$N = \frac{(Z\alpha/2)^2 P(1-P)}{e^2}$$

$Z\alpha/2$ = standard normal deviation corresponding to 95% confidence interval set at 1.96.

$Z\beta$ = power of the study (80% power)

e = level of error / tolerance set at 5% (effect 0.05)

P = Assumed proportion taken as 50%

N = Minimum required sample size was therefore calculated as:

$$N = \frac{(1.96)^2 (0.5) (1-0.5)}{0.05^2} = 384.16$$

=384 under-five children.

Adjusting the sample size for 10% non – response (NR)

$$\begin{aligned} \text{Adjusted sample} &= \frac{n}{1-NR} \\ &= \frac{384}{1-10\%} \\ &= \frac{384}{0.9} = 427 \end{aligned}$$

The total sample size for the three states was calculated as

$$N = 3 * 427 = 1281$$

A total of 1308 mother-child (under-five children) peers were sampled for the baseline survey in the three states.

The minimal sample size for the intervention and control group in the study was determined using Kirkwood and Sterne, (2003) sample size formula below

$$N = \frac{2 [(Z\alpha + Z\beta)^2 \pi (1 - \pi)]}{d^2}$$

$Z\alpha$ = standard normal value corresponding to 95% confidence level set at 1.96

$Z\beta$ = standard normal value to a power of 80% set at 0.84

P_1 = using exclusive breastfeeding rate of 17% (NDHS, 2013)

n = minimum sample size

d = design effect taken as 5%

π = average proportion of the experimental and control groups

$$\pi = \frac{0.17+0.05}{2} = 0.11$$

$$1-\pi = 1-0.11 = 0.89$$

$$n = \frac{2 [(1.96+0.84)^2 (0.11) (0.89)]}{(0.05)^2} = 307$$

$$n = 2 * 307 = 614 \text{ respondents}$$

Therefore, 654 (327 experimental and 327 control groups) mothers were recruited from the respondents using systematic random sampling technique.

3.5 Inclusion criteria

All apparently healthy under-five children and their mothers (mother-child pair) within the sampled communities that had previous records of treatment or of receiving child survival interventions for under-five children such as newborn care, immunisation, vitamin A supplementation, management of childhood illness (diarrhoea, pneumonia, malaria, and so on), during maternal newborn and child health weeks, immunisation campaigns and outreach programmes or during routine immunisation in the health facility or community outreach were included. Where there were two under-five children, the younger one was sampled.

3.6 Exclusion Criteria

The study excluded children from 60 months and above or children that were not exposed to any child survival intervention.

3.7. Sampling procedure

3.7.1 Sampling Technique: Four-stage sampling technique was used. The sampling was done using a random sampling technique which was conducted in stages as follows:

First stage: Simple random technique was used to sample three states from the six states in South-west, Nigeria. A sampling frame of all the states in South-west Nigeria was drawn and Ekiti, Oyo and Ogun States were sampled using simple random sampling technique. The local government areas (LGAs) in each of the sampled states were drawn and stratified into urban and rural areas based on World Bank classification. One urban and one rural local government areas were sampled using simple random sampling technique.

Second stage: A sampling frame of all the communities in the sampled LGAs was drawn. Three communities were sampled from each of the local government areas using simple random sampling technique.

Third stage: A total of 1308 households were sampled from the three states using a systematic random sampling technique. A landmark was identified in each of the sampled communities (Rose et. al., 2006; Araoye, 2004). The direction where the head of the bottle faced marked the starting point of the systematic random household sampling. A household was sampled after every K^{th} house. The K^{th} (sampling interval) was calculated by dividing the number of households in the LGAs (got from the National Population Council) by the sample population. In the case where the sampled household did not have an eligible child, the next house was sampled.

Fourth stage: every eligible mother-child pairs from the sampled households were included and where there were two under-five children, the younger child was recruited. The sample frame for each local government was based on the total population of under-5 children in that LGA.

3.8 Data collection procedure

3.8.1 Questionnaire Validation and Reliability of data

A pretest was conducted in another community (different from the ones sampled) to test the validity of the questionnaire and reliability of the scale and also ensure the collection of appropriate and correct anthropometric measurements from the under-five children. Modifications were made based on the environmental variations and the objectives of the study. The research assistants were trained on the data collection procedures and how to take accurate anthropometric measurements of the respondents.

The instruments used were validated to ensure that they measured what they were supposed to measure. For instance, the weighing scale was validated by taking the weight of standard weight (an object whose weight is already known) -the ability of the scale to accurately measure this object indicated that its measurements were precise and accurate.

To further ensure that good data were collected the following steps were taken before and during data collection:

- ❖ The weighing scales were standardised at the beginning of every session;
- ❖ All readings were taken in duplicate to ensure accuracy and avoid error due to parallax;
- ❖ Readings were recorded immediately in the appropriate space provided for it in the questionnaire;
- ❖ Height was measured standing with heels of the feet placed together and both heels touching the base of the wall marked with a non-stretchable tape, while the arms hang freely by the sides of the respondent.
- ❖ For mid-upper arm circumference (MUAC), accuracy was ensured by making sure the zero ends of the tape was held below the measurement value.

The reliability of the scale was tested and a high Cronbach's alpha (0.9) was derived. The high alpha (Cronbach's alpha >7) showed that all items in the scales measured the same construct and indicated a good level of consistency in the responses from the respondents.

3.8.2 Data collection tools and processes

Qualitative and quantitative methods were adopted for data collection.

3.8.2.1 Qualitative methods

Focus group discussion (FGD) was conducted for sampled caregivers in each of the LGA with the use of FGD guide. The FGD was conducted at the beginning of the study before the baseline survey was done. It was conducted to discover the existing child survival interventions in the sampled communities, types of information they were already exposed to, peculiarities within the communities influencing mothers' child survival practices and to explore the perceived benefits and limitation to the uptake of interventions among mothers of under-five children and health workers in each of the LGAs. This information was used to adapt the questionnaires and BCC tools used in the study. Twelve sessions of FGDs were conducted with an average of eight participants per session. Two sessions were conducted in each of the LGA and four sessions per state. The sessions were guided by the researcher and discussions were done in Yoruba and English language as appropriate for the participants. The sessions were documented and

recorded to effectively recall all the sessions. Those that participated in the FGD were drawn from the LGAs using the simple random technique.

3.8.2.2 Quantitative methods

A pre-tested interviewer-administered semi-structured questionnaire adapted from other studies, WHO generic and NDHS, 2013 was used to obtain information at baseline and post-intervention phases. The questionnaire was used to collect information on demographic and socio-economic characteristics, child-related, maternal, paternal, and environmental factors from the households consisting of dietary pattern, nutrient intake, infant and young child feeding practices, hygiene practices, and uptake of interventions. The morbidity among the children was assessed using the frequency of various infections and childhood illnesses (diarrhoea, cold, cough, fever, and so on) within two weeks preceding the day of the collection of the information. The type of treatment given, and dietary modifications adopted owing to illness, was determined by questioning the mothers.

Information on child survival interventions received was assessed using the observational checklist and Key Informant Interview. Anthropometric indices of weight, height and mid-upper arm circumference (MUAC) were measured to determine the nutritional status of the children. Nutrient intake of the children was assessed through the 24-hour dietary recall of eligible children with the assistance of their mother or primary caregivers (Gibson, 2005). The questionnaire was administered to mothers of the under-5 children with the questions directed to their children (Gibson, 2005). It was also translated into Yoruba for easy understanding and accuracy.

Pre-intervention phase: Pre-tested, interviewer-administered semi-structured questionnaire was administered to households to collect information on demographic and socio-economic characteristics, child-related, maternal, paternal, and environmental factors. The questionnaire contained a 4 point Likert scale derived from 12 knowledge statements and 13 questions on mothers' practices. This was used to determine the baseline knowledge and current practices that influence under-five survival within the study areas.

Intervention phase: A total of 654 Mothers were sampled from those that participated in the baseline survey using systematic random sampling techniques. Randomised cluster sampling was used to randomly assign the communities within the LGAs to intervention and control communities. Individuals were reclassified into intervention and control groups based on the community they lived using systematic random sampling technique.

The experimental group was exposed to six sessions of behavioural change communication (BCC) using interpersonal communication (IPC) approach. The behavioural change communication (BCC) consist of the components of child survival as defined by WHO (2006) which includes: Care of the newborn, breastfeeding and complementary feeding, micronutrient supplementation, immunisation of children and mothers, integrated management of sick children such as prevention and management of diarrhoea and malaria and use of insecticide-treated bed nets. The BCC was done through the interpersonal communication (IPC) which was conducted by trained IPC coordinators or research assistants. The BCC was conducted for 45 minutes per session and six sessions spread over 24 weeks (the intervention was repeated after every four weeks until the 24th week when the post-intervention questionnaires were administered).

The BCC message comprised of eight sections on the prevention of under-five mortality and management of childhood illnesses. The sections include infant and young child feeding practices: Exclusive breastfeeding, complementary feeding, nutrition and growth, and micronutrient supplementation; immunisation, hygiene, hand washing, diarrhoea prevention and management, management of childhood illnesses, safe motherhood practices and the use of LLIN.

Uniformity of BCC content was ensured through the use of standardised tools (pictorial flip charts and cards) which were adapted from WHO and UNICEF guidelines on the integrated management of childhood illnesses, child survival and infant and young child feeding (IYCF) practices. These tools were used by the IPC coordinators as communication and discussion guides. Eight IPC coordinators used the information displayed on the flip charts and cards to effectively communicate and discuss the behaviour change with the participants for about 45 minutes on a one-to-one basis. This

was reinforced after every four weeks until the 24th week when the post-intervention evaluation was conducted.

Post-intervention stages: the intervention was evaluated by administering the same instruments used to collect the baseline information, to the mothers that received the intervention. In order to allow for proper tracking of mothers involved in the intervention stage, personal details (house marking/address and phone numbers) of mothers were collected and recorded and used to send a constant reminder of the child survival practices and also for proper follow-up on the mothers.

3.8.3: Anthropometric Method:

The anthropometric measurement such as height, weight, and MUAC was measured to determine the nutritional status of the under-five children: height was measured in meters using non-stretch tapes. Weight was measured in kilogram using digital weighing scales. Children whose height/length for age, weight for height and weight for age was less than -2SD was considered to be stunted, wasted or underweight respectively.

Mid-upper arm circumference (MUAC): Mid-upper arm circumference (MUAC) was measured using UNICEF MUAC tape. The MUAC was determined by taking the measurement at the midpoint between the shoulder bone and elbow. Each child was made to stand with the elbow relaxed so that the right arm could hang freely to the side. The examiner stood to face the right side and the MUAC tape was placed around the upper arm at the marked point perpendicular to the long axis of the upper arm (from upper arm length). The tape was held in such a way that, the zero ends were held below the measurement value. The tape rested on the skin surface but was not pulled tight enough to compress the skin. The mid-upper arm circumference was recorded to the nearest 0.1cm. MUAC was used to screen for wasting among the children.

3.8.4: Dietary intake and pattern

Assessment of nutrient intake: Dietary/nutrient intake of the children was assessed from dietary recall data of food given to the children the previous day. The 24-hour dietary recall was conducted on eligible children with the assistance of their mother or primary caregivers to assess the nutrient/dietary intake of these children (Gibson, 2005). In order to ensure that food taken outside the home was captured, people (teachers, caregivers, neighbours) that had contact with the child were interviewed on food eaten by the child while the child was in their care (Gibson, 2005).

Assessment of dietary pattern: Dietary habits and food consumption patterns of the children was assessed using a 111 item semi-quantitative food frequency questionnaire (FFQ). Participant's mother was asked how frequent the child consumes a given food item during the previous six months.

3.9 Data analysis and methods used

Data were checked for errors and omissions and corrected on the field. Data collected were sorted, cleaned and coded before being computed for analysis. Entering and analysis were done using SPSS version 20, WHO Anthro, version 3, 2009: Software for assessing growth and development of the world's children and Total Dietary Assessment software was used to calculate the estimated nutrient intake of the children from their 24-hour dietary recall. Classification of the nutritional status of the under-five children was done using the World Health Organisation growth standard.

Descriptive statistics, Chi-square test, correlation, and multiple regressions were performed on data obtained at 5% level of significance. Appropriate graphs and diagrams of relevant variables were constructed. Food groups were generated from the FFQ using factor analysis. This identified the patterns of food consumed by children in the LGAs. Cronbach's alpha was used to test the level of internal consistency and reliability.

Socioeconomic status: The socioeconomic status (SES) of respondents in this study was calculated using the wealth index adapted from NDHS (2013). Weights (SES) were assigned to household facilities and assets of respondents. The socioeconomic status was constructed using household asset data through a principal components analysis, which is an indicator of wealth consistent with household expenditure (Rutstein, 1999; Rutstein, 2004; NDHS, 2013). These accounts were better for urban-rural differences in scores and wealth indicators. Categorical variables used were transformed into separate dichotomous (0-1) indicators that were used with continuous indicators to produce a common factor score for each household using a principal components analysis (PCA). The score was divided into three equal categories (low/poor, middle and higher) and households were ranked (from lowest to highest) based on their scores. Mothers were ranked according to the total score of the household in which they resided as generated by the PCA from one (lowest: -9 to -3) to three (highest: 4-9).

Mortality rate calculation: Under-five mortality (probability that under-five children die before celebrating their fifth birthday) rate in this study was derived from data on births and deaths occurring under the age of five years in the previous five years before the study. The data used to estimate under-five mortality were contained in section E of the questionnaire which was adapted from NDHS (2013). This section asked respondents questions about their childbearing experience (i.e., the number of children living with them, those living elsewhere, and those that had died). Afterward, respondents were asked to give a retrospective birth history in which they listed each of their births, starting from the first birth. For each of the birth, information on sex, month and year of birth, survivorship status, and current age or, if the child was dead, age at death was obtained. This information was used to directly estimate the under-five mortality rate defined as the probability of dying between birth and the fifth birthday. The rate was expressed per 1,000 live births (NDHS, 2013).

Data quality: Under-five mortality estimated based on retrospective birth histories, may be subject to possible reporting errors that can adversely affect the quality of the data. These may result from the completeness with which births and deaths are reported and recorded,

as well as the accuracy of information obtained on current age and age at death for children who died.

Determinants of child survival: these were analysed using logistic regression. The dependent variables were binary, for which the response outcome for each subject is “died or alive”, thus logistic regression was used to estimate the odds of a child dying before reaching five years of age. This model was used to investigate the significant determinants of under-five mortality in the study. The dependent variable noted one if the respondent experienced child death (under-five child) in the previous five years before the study and noted zero if otherwise. This was only performed on data collected at baseline.

Analysing mothers’ knowledge and practices influencing child survival:

Respondents’ knowledge of the components of child survival was analysed using a four-point Likert scale derived from 12 knowledge statements which were categorised into poor (<4), fair (4-6), good (7-9), excellent (>9). Respondents’ practices were measured using 13 child survival practice statements. This was used to analyse practices such as the use of mosquito net, hand washing, vitamin A supplementation, appropriate diarrhoea treatment, deworming, immunisation and family planning. Paired sample t-test was used to evaluate the impact of BCC on the knowledge and practices influencing child survival among mothers of under-five children in the study at baseline and after the intervention. The magnitude of the mean difference (effect size of intervention) was calculated using Eta squared statistics

$$\text{Effect size (Eta squared)} \quad t^2 \frac{\quad}{t^2 + (N - 1)}$$

The effect size was classified based on Cohen (1988) classification: 0.2 = small effect; 0.5 = medium effect, 0.8 = large effect.

Nutrient intake: quantitative 24-hour recall was analysed using adapted total dietary assessment (TDA) software. The researcher made a list of different food items sold on each street of the different communities sampled with their cost and weight equivalent.

The weight equivalent of portion sizes of food in the communities based on household measures were also estimated, for instance, one serving spoon of rice was about 125g. Food consumed by children from the 24-hour recall was converted to grams using the cost or quantity of food served as specified by their mothers.

This was used to estimate the weight of food consumed by the children in the different communities which was then computed into TDA software. The dietary intake of energy, nutrients, and cholesterol for the children was calculated from their 24-hour dietary recall using the TDA software version 2001, which gave the estimated nutrient of the food recall of each child. This was used to determine the usual daily intakes and adequacy of nutrients vis-à-vis RDA for children of 24 to 59 months in the study. The software was adapted to include locally made foods using the Nigeria food composition table. Mean daily dietary intake and consumption were estimated from the nutrient intake of the children. This was categorised as inadequate (<80%), adequate (80-120%) and excess (>120%).

Dietary pattern: Factor analysis was used to reduce the list of 111 foods to a few key groups (factors), such that the foods in each group tend to be consumed together (Gittelsohn et al., 1997). The items that loaded into each of the factors were remarkably consistent with food groups consumed by the children in the study, these included cereals, root and tuber, legumes, snacks, meat, fish and fish product, milk and dairy, fat and oil, fruits, vegetables, and beverages. The principal factor method was used to extract the factors, followed by an orthogonal rotation (Rourke & Hatcher, 2013). A combination of screen test (a plot of the eigenvalues of the factors) and assessment of the proportion of variance accounted by the factors were utilised to determine the number of factors to be retained for rotation. In interpreting the rotated factor pattern, a selected food was considered to load on a given factor (dietary pattern) if the factor loading was >0.2 for that factor and >0.15 for all other factors. No food item was permitted to load more than one factor; therefore, each scale contains a distinct set of foods.

Factor scores (dietary pattern) were computed for each participant by adding up the scores for all the foods in the same factor (food groups). Factors were named based on

the food groups consumed by children in the study. Cronbach's alpha was used to test the level of internal consistency reliability of the responses from the children's FFQ. A high alpha (Cronbach's alpha >7) showed that all items in the scales were measuring the same construct.

Focused Group Discussion (FGD): The FGD was interpreted using a thematic approach to bring out the perceived limitation to the uptake of child survival interventions.

3.10 Duration of the study:

The study was conducted for 17 months.

3.11 Ethical Considerations

Ethical consideration was obtained from the U.I/UCH Institutional Review Board. Consent was sought from the State Ministry of Health, leaders of the communities involved and mothers of the under-five children sampled.

Voluntary Participation: Participation in this research was entirely voluntary. A study participant was free to withdraw from the study at any time without loss of benefits.

Benefits: beneficence to participants: The researcher gave behavioural change communication on components and essential packages of child survival strategies to mothers of the under-five children and also provided a nutritional assessment of the children participating in the study. Mothers of the under-five children that participated in the study were given long-lasting insecticide-treated Net (LLIN).

3.12 Limitations of the Study

- ❖ The dietary information was gathered by reporting and not by observation.
- ❖ Some of the interventions were assessed based on reported information from mothers of under-five children.
- ❖ Child mortality estimated based on retrospective birth histories may be subject to possible reporting errors that can affect the quality of the data.

CHAPTER FOUR

RESULTS

4.0: Results: The analysis and results of the data obtained are presented in the following Tables and figures. The level of significance ($p < 0.05$) was measured between urban and rural settlements; among the three states and between experimental and control groups.

4.1: Household Demographic Characteristics of Mothers: The result obtained for the demographic characteristics of mothers at the household is shown in Table 4.1a. A total of 1308 mothers and their under-five children (mother-child pair) consisting of 426 (32.4%) from Ekiti, 438 (33.5%) from Oyo and 444 (33.9%) from Ogun States were interviewed. The overall mean age of the mothers was 30.7 ± 6.1 years (Ekiti, Oyo, and Ogun States were 30.7 ± 6.4 , 31.1 ± 6.5 , and 30.4 ± 5.5 years respectively). About 23.5% of the respondent lived in rural areas and 73.6% were from the urban settlements. The mean number of children per mother (parity) in the study was 2.4 ± 1.4 (2.5 ± 1.5 , 2.5 ± 1.5 , and 2.2 ± 1.2 for Ekiti, Oyo and Ogun States respectively). The mean height and weight of the respondents in the study were 1.6 ± 0.1 , and 62.9 ± 11.7 respectively. There was a significant difference ($p < 0.05$) among the states in the mean age and number of children per mother.

The distribution of the subjects according to their marital status showed that most (94.9%) of the mothers in the study were married with 94.8%, 95.2% and 94.6% for Ekiti, Oyo and Ogun State respectively. Majority of the subjects were Christians (70.7%) and 28.9% of them practiced Islam. A large proportion of the respondents were of Yoruba origin (89.8%). A significant difference was observed among respondents in the three states regarding their distribution according to religion and ethnic composition. Classifying the respondents according to where they lived (residence) revealed a significant difference in the mean age of respondents, the number of children per mother and in their religious and ethnic composition.

Classification of Respondents into Experimental and Control Groups: The Classification of respondents into experimental and control groups as shown in table 4.1b, revealed that there was no significant difference in the demographic characteristics of respondents between the groups.

Table 4.1a: Demographic Characteristics of Respondents (Mothers of the under-five children)

Characteristics	Residence			State		Total (%)	
	Urban (%)	Rural (%)	Ekiti (%)	Oyo (%)	Ogun (%)		
Age of mothers (years)	≤19	7 (0.7)	5 (1.6)	2 (0.5)	7 (1.6)	3 (0.7)	12 (0.9)
	20-29	422 (42.2)	160 (52.1)	207(48.6)	179(40.9)	196 (44.1)	582 (44.5)
	30-39	475 (47.4)	113 (36.8)	172(40.4)	197(44.9)	219 (49.3)	588 (45.0)
	≥ 40	97 (9.7)	29 (9.5)	45(10.5)	55 (12.6)	26 (5.9)	126 (9.6)
	Mean, Std. Deviation	30.9±5.9	30.2±6.8	30.7±6.4	31.1±6.5	30.4±5.5	30.70±6.14
	P<0.05	0.006		0.002			
Number of children per mother	1-4 children	927 (92.6)	269 (87.6)	375 (88.0)	396 (90.4)	425 (95.7)	1196 (91.4)
	>4 children	74 (7.4)	38 (12.4)	51 (12.0)	42 (9.6)	19 (4.3)	112 (8.6)
	Mean, Std. Deviation	2.4±1.4	2.5±1.5	2.5±1.5	2.5±1.5	2.2±1.2	2.4±1.4
	P<0.05	0.006		0.000			
Height (m):	Mean, Std. Deviation	1.6±0.1	1.6±0.1	1.6±0.1	1.6±0.1	1.6±0.1	1.6±0.1
Weight (kg) :	Mean, Std. Deviation	63.2±11.4	61.6±12.6	64.0±12.5	63.4±12.9	61.2±9.4	62.9±11.7
Marital status	Single	30 (3.0)	18 (5.9)	17 (4.0)	17 (3.9)	14 (3.2)	48 (3.7)
	Married	956 (95.5)	285 (92.8)	404 (94.8)	417 (95.2)	420 (94.6)	1241 (94.9)
	Divorced/ Widowed	15 (1.5)	4 (1.3)	5 (1.2)	4 (0.9)	10 (2.2)	19 (1.4)
	P<0.05	0.064		0.468			
Religion	Christianity	668 (66.7)	257 (83.7)	369 (86.6)	269 (61.4)	287 (64.6)	925 (70.7)
	Islam	329 (32.9)	49 (16.0)	56 (13.2)	168 (38.4)	154 (34.7)	378 (28.9)
	Traditional believe	4 (0.4)	1 (0.3)	1 (0.2)	1 (0.2)	3 (0.7)	5 (0.4)
	P<0.05	0.000		0.000			
Ethnicity group	Yoruba	903 (90.2)	271 (88.3)	389 (91.3)	410 (93.6)	375 (84.5)	903 (90.2)
	Igbo	73 (7.3)	7 (2.3)	22 (5.2)	18 (4.1)	40 (9.0)	73 (7.3)
	*Others	25 (2.5)	29 (9.4)	15 (3.5)	10 (2.3)	29 (6.5)	25 (2.5)
	P<0.05	0.000		0.000			
Total	Number (total)	1001 (76.5)	307 (23.5)	426 (32.6)	438 (33.5)	444 (33.9)	1308 (100)

*Others = Hausa, Igala, Cotoonue, Efik and so on.

Table 4.1b: Demographic Characteristics of Respondents (Mothers of the under-five children) in Experimental and Control Groups

Characteristics		Groups		Total (%)
		Experimental (%)	Control (%)	
Age of mothers (years)	≤19	2 (0.7)	2 (0.7)	4 (0.7)
	20-29	133(44.5)	124 (41.5)	257 (43.0)
	30-39	128(42.8)	141(47.2)	269 (45.0)
	≥ 40	36(12.0)	32 (10.7)	68 (11.4)
	Mean, Std. Deviation	30.97±6.15	31.19±5.87	31.08±6.01
	P<0.05	0.758		
Number of children per mother	1-4 children	280 (93.6)	275 (92.0)	555(92.8)
	>4 children	19 (6.4)	24 (8.0)	43 (7.2)
	Mean, Std. Deviation	2.34±1.31	2.35±1.33	2.34±1.32
	P<0.05	0.264		0.000
Height (m)	Mean, Std. Deviation	1.60±0.06	1.60±0.08	1.60±0.07
Weight (kg)	Mean, Std. Deviation	62.01±12.02	63.42±12.22	62.72±12.14
Marital status	Single	14(4.7)	9(3.0)	23 (3.8)
	Married	284 (95.0)	284(95.0)	568(95.0)
	Divorced/ Widowed	1 (0.3)	6 (2.0)	7(1.2)
	P<0.05	0.097		
Religion	Christianity	215(71.9)	223(74.6)	438(73.2)
	Islam	84 (28.1)	74 (24.7)	158(26.4)
	Traditional believe	0 (0.0)	2 (0.7)	2 (0.3)
	P<0.05	0.249		
Ethnicity group	Yoruba	275 (92.0)	261 (87.3)	536 (89.6)
	Igbo	15 (5.0)	17(5.7)	32 (5.4)
	*Others	9 (3.0)	21(7.0)	30 (5.0)
	P<0.05	0.071		
Total	Number (total)	299 (50.0)	299 (50.0)	598 (100.0)

*Others = Hausa, Igala, Cotoonue, Efik and so on.

4.2: Household Socio-Demographic Characteristics

Table 4.2a revealed that the mean number of persons per household in the study was 4.5 ± 1.7 . It was 4.7 ± 1.9 , 4.5 ± 1.6 , and 4.3 ± 1.5 for Ekiti, Oyo and Ogun State respectively

Educational Status of the fathers: A higher proportion of the fathers (38.7%) had secondary education while 8.6% of them had no formal education. Ekiti State had the highest proportion of fathers with no formal education (11.0%) and tertiary education (39.4%). Oyo State had the highest proportion (44.8%) of fathers with secondary education. Ogun State had the highest proportion (30.6%) of fathers with primary education. There was a significant difference ($p < 0.05$) among the states in the educational level of the fathers.

Maternal Educational Status: A higher proportion of the mothers (51.8%) had secondary education while 3.5% of them had no formal education. Ekiti State had the highest proportion of mothers with tertiary education (34.5%), Oyo State had the highest proportion of mothers with secondary education (60.6%) and Ogun State had the highest proportion of mothers with no formal education (6.1%). The study showed a significant difference in mothers' educational status among the three states.

The literacy level of Respondents: With respect to literacy level, 44.3% of mothers can read the whole sentence, 34.2% can only read part of the sentence while 21.6% cannot read at all. Ogun State has the highest proportion of respondent that cannot read at all and those that can read the whole sentence. Classifying the respondent into Urban-rural residence revealed a significant difference ($p < 0.05$) in literacy level according to where the participants live and also in the distribution according to the different states.

Primary Occupation of the father: The primary occupation of the Fathers showed that they were artisans (38.2%), traders (26.1%), professionals (doctors, bankers, lawyers, clergy and civil servants) (27.1%), farmers (4.3%) and 4.4% of them were unemployed. Among the states, Ekiti State has the highest (7.0%) level of unemployment. The study showed a significant difference in the distribution of fathers according to their occupation in the three states.

Primary Occupation of the mother: Maternal occupational status (Fig 4.2) revealed that the mothers were artisans (30.2%), professionals (doctors, bankers, lawyers, clergy and civil servants) (13.4%), traders (47.7%), farmers (3.7%) and 5.0% of them were unemployed. Ekiti State has the highest (7.5%) level of unemployment among the mothers. The study showed a significant difference in the distribution of mothers according to their occupation in the three states.

Exposure of Under-five Children to Second Hand Smoking:With respect to the exposure of under-five children to second-hand smoke (SHS), 7.6% of the respondents had someone who smoked in their household while the majority (92.4%)reported that no one smoked in their households.

Classification of Respondents into Experimental and Control Groups: The Classification of respondents into experimental and control groups as seen in table 4.2b, showed that apart from fathers occupational level, there was no significant difference in household socio-demographic characteristics of respondents between the groups. A large proportion of the fathers in the experimental group had a primary education (54.5%) while a large proportion of fathers of under-five children in the control group had secondary (41.8%) and tertiary (40.8%) education. The experimental group had the highest proportion of fathers with no formal education.

Table 4.2a: Household Socio-Demographic Characteristics

Characteristics		Residence		State			Total (%)
		Urban (%)	Rural (%)	Ekiti (%)	Oyo (%)	Ogun (%)	
Household size	1-4 persons	599 (59.8)	163 (53.1)	234 (54.9)	244 (55.7)	284 (64.0)	762 (58.3)
	5-8 persons	385 (38.5)	131 (42.7)	176 (41.3)	188 (42.9)	152 (34.2)	516 (39.4)
	≥ 9 persons	17 (1.7)	13 (4.2)	16 (3.8)	6 (1.4)	8 (1.8)	30 (2.3)
	Mean, Std. Deviation	4.46±1.54	4.78±2.00	4.73±1.90	4.54±1.59	4.34±1.47	4.54±1.67
	P<0.05	0.009		0.006			
Educational qualification (father)	No formal education	70 (7.0)	42 (13.7)	47 (11.0)	35 (8.0)	31 (7.0)	113 (8.6)
	Primary	218(21.8)	73 (23.9)	80 (18.8)	75 (17.1)	136 (30.6)	291 (22.2)
	Secondary	406(40.6)	99 (32.3)	131 (30.8)	196 (44.8)	179 (40.3)	506 (38.7)
	Tertiary	306 (30.6)	92 (30.1)	168 (39.4)	132 (30.1)	98 (22.1)	398 (30.5)
	P<0.05	0.001		0.000			
Literacy level	Cannot read at all	142 (14.2)	74 (24.1)	75 (17.6)	53 (12.1)	88 (19.8)	216 (16.5)
	Can read only part of sentence	372 (37.2)	98 (31.9)	128 (30.0)	236 (53.9)	106 (23.9)	470 (35.9)
	Able to read whole sentence	487 (48.7)	135 (44.0)	223 (52.3)	149 (34.0)	250 (56.3)	622 (47.6)
	P<0.05	0.000		0.000			
Primary occupation of the father	Unemployed	37 (3.7)	20 (6.5)	30 (7.0)	17(3.9)	10 (2.3)	57(4.4)
	Farmer/ hunter	16 (1.6)	40 (13.0)	11 (2.6)	9 (2.1)	36 (8.1)	56 (4.3)
	Trader	285(28.5)	56 (18.2)	103 (24.2)	123 (28.1)	115 (25.9)	341 (26.1)
	Artisan	389 (38.9)	111 (36.2)	166 (39.0)	160 (36.5)	174 (39.2)	500 (38.2)
	Professionals	274 (27.3)	80 (26.1)	116(27.2)	129 (29.4)	109 (24.5)	354 (27.0)
	P<0.05	0.000		0.000			
Anyone smoking in household	No	937 (93.6)	272 (88.6)	402 (94.4)	406 (92.7)	401 (90.3)	1209 (92.4)
	Yes	64 (6.4)	35 (11.4)	24 (5.6)	32 (7.3)	43 (9.7)	99 (7.6)
	P<0.05	0.004		0.076			
Total	Number (total)	1001 (76.5)	307 (23.5)	426 (32.6)	438 (33.5)	444 (33.9)	1308 (100)

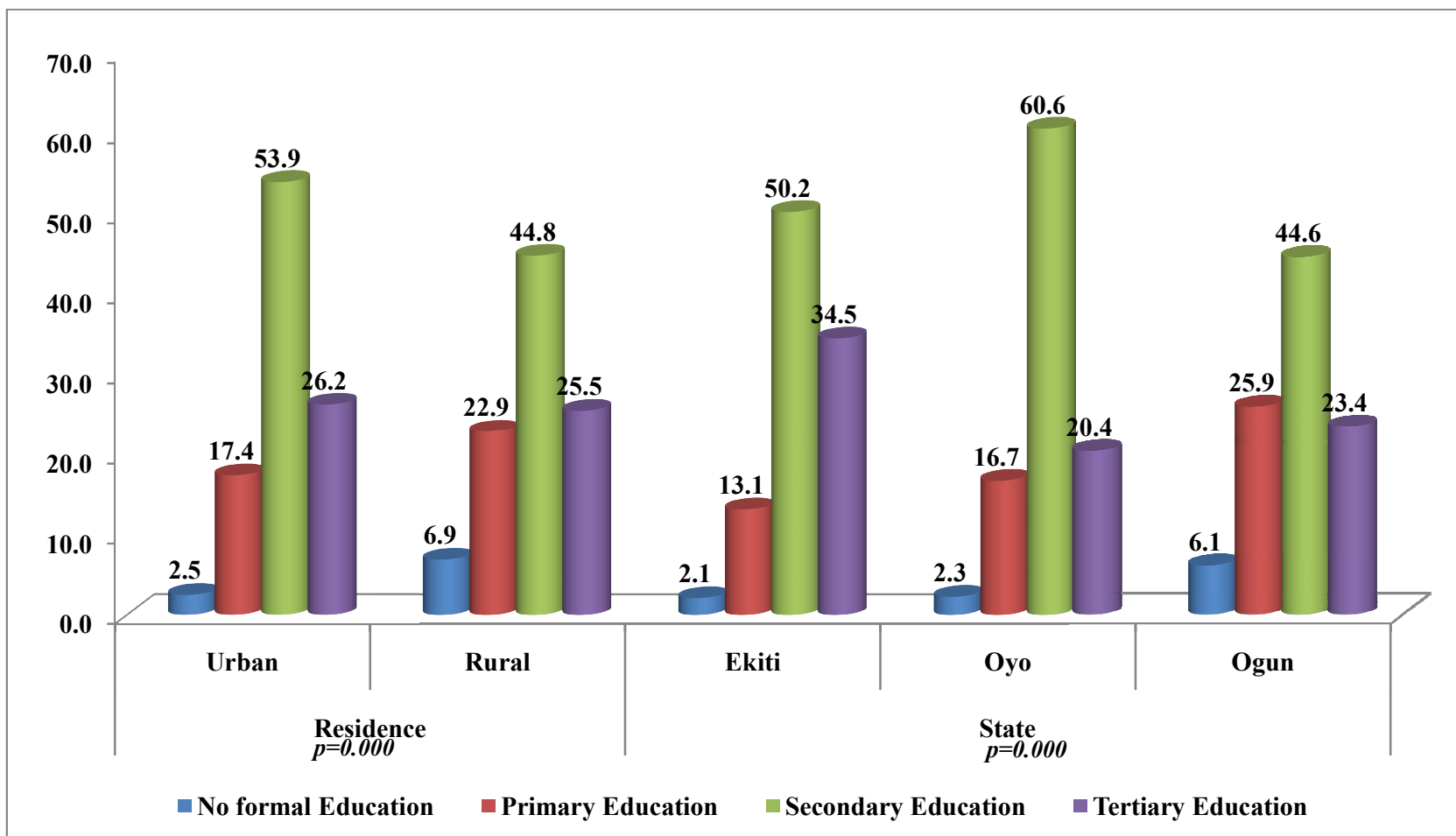


Figure 4.1: Maternal Educational Status

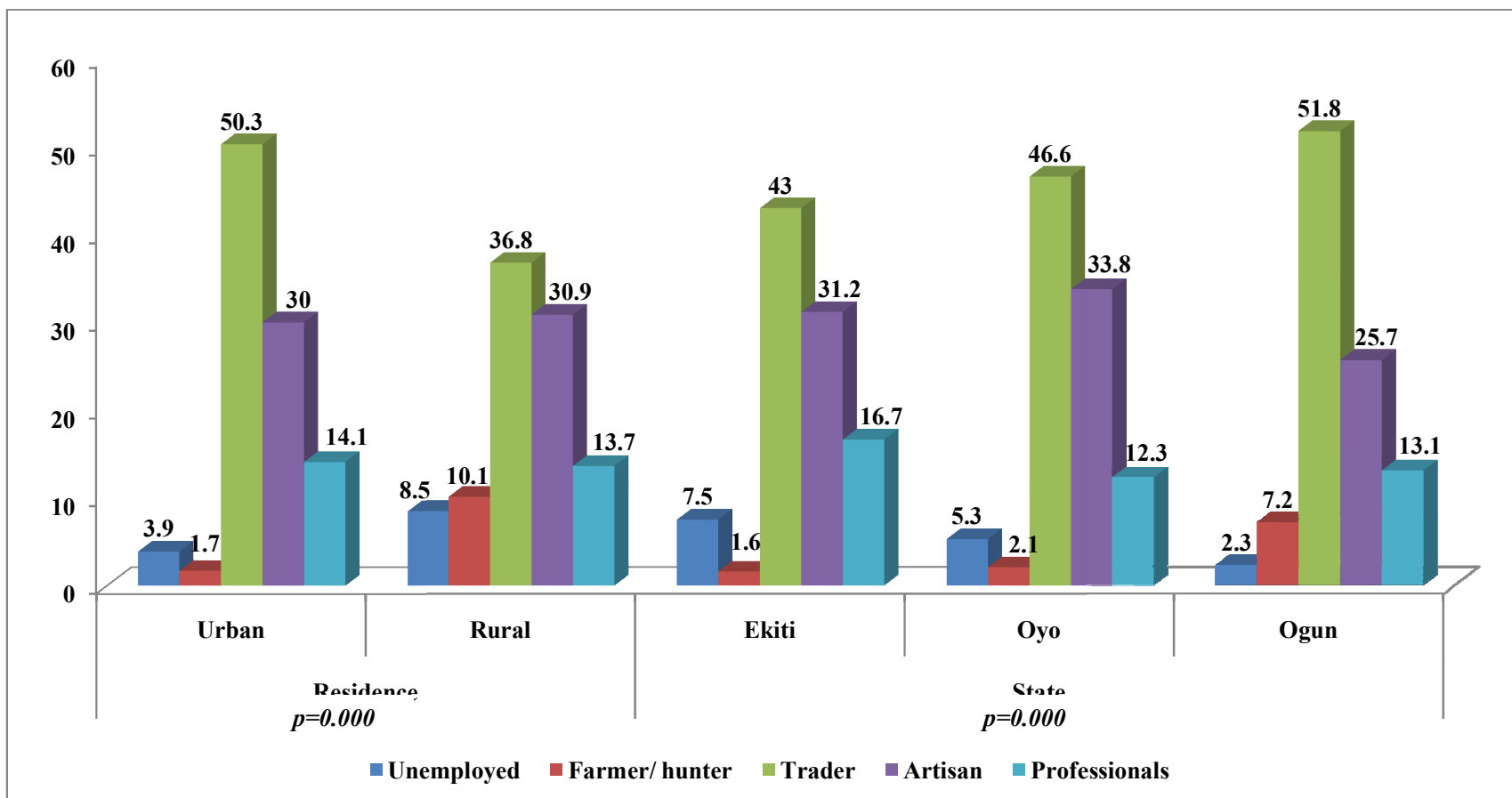


Fig. 4.2: Primary Occupation of Mothers

Table 4.2b: Household Socio-Demographic Characteristics of Respondents in the Experimental and Control Groups

Characteristics		Group		Total(%)
		Experimental (%)	Control (%)	
Household size	1-4 persons	176 (58.9)	170 (56.9)	234 (54.9)
	5-8 persons	110 (36.8)	121 (40.5)	176 (41.3)
	≥ 9 persons	13 (4.3)	8 (2.7)	16 (3.8)
	Mean, Std. Deviation	4.62±1.83	4.52±1.61	4.57±1.72
	P<0.05	0.403		0.006
Educational qualification (mothers)	No formal education	5 (1.7)	13 (4.3)	18 (3.0)
	Primary	52 (17.4)	58 (19.4)	110 (18.4)
	Secondary	154 (51.5)	143 (47.8)	297 (49.7)
	Tertiary	88 (29.4)	85 (28.4)	173 (28.9)
	P<0.05	0.227		
Educational qualification (fathers)	No formal education	78 (26.1)	9 (3.0)	87 (14.5)
	Primary	163 (54.5)	43 (14.4)	206 (34.4)
	Secondary	33 (11.0)	125 (41.8)	158 (26.4)
	Tertiary	25 (8.4)	122 (40.8)	147 (24.6)
	P<0.05	0.000		
Literacy level	Cannot read at all	56 (18.7)	67 (22.4)	123 (20.6)
	Can read only part of sentence	107 (35.8)	100 (33.4)	207 (34.6)
	Able to read whole sentence	136 (45.5)	132 (44.1)	268 (44.8)
	P<0.05	0.527		
The primary occupation of mothers	Unemployed	17 (5.7)	13 (4.3)	30 (5.0)
	Farmer/ hunter	10 (3.3)	19 (6.4)	29 (4.8)
	Trader	132 (44.1)	141 (47.2)	273 (45.7)
	Artisan	95 (31.8)	87 (29.1)	182 (30.4)
	Professionals	45 (15.1)	39 (13.0)	84 (14.1)
	P<0.05	0.290		
The primary occupation of fathers	Unemployed	14 (4.7)	11 (3.7)	25 (4.2)
	Farmer/ hunter	12 (4.0)	16 (5.4)	28 (4.7)
	Trader	67 (22.4)	84 (28.1)	151 (25.3)
	Artisan	127 (42.5)	105 (35.1)	232 (38.8)
	Professionals	79 (26.4)	83 (27.8)	162 (27.1)
	P<0.05	0.411		0.000
Anyone smoking in the household	No	274 (91.6)	273 (91.3)	547(91.5)
	Yes	25 (8.4)	26 (8.7)	51 (8.5)
	P<0.05	0.500		0.076
Total	Number (total)	299 (50.0)	299(50.0)	598 (100)

4.3 Demographic Characteristics of the Children

Table 4.3a showed the demographic characteristics of the children that participated in the study. The mean age of the under-five children recruited in the study was 28.8 ± 14.8 months. The mean age of children from Ekiti, Oyo, and Ogun State was 27.2 ± 15.1 months, 28.3 ± 15.9 months and 30.8 ± 13.2 months respectively. There was a significant difference ($p < 0.05$) in the mean age of children between the urban and rural residence and among the state.

Sex of children in the study

There were a total of 656 (50.2%) males and 652 (49.8%) females under-five children in the study. Only 31%, 32% and 36.9% of the males were from Ekiti, Oyo and Ogun State respectively. For the female under-five children 34%, 35%, and 31% were from Ekiti, Oyo and Ogun State respectively. There was no significant difference ($p > 0.05$) in the selection of male and female preschool children from the three states.

Birth weight of children in the study

Table 4.3a revealed that the weight at birth was reported for 64.3% of the children. About 12.8% of them weighed less than 2.5 kilograms. Rural areas had the highest percentage of Low birth weight (LBW) children. A significant difference ($p < 0.05$) in the birth weight of children was observed among the states. Ekiti and Oyo States had the highest (18.2%) and lowest (14.4%) percentage of children with LBW respectively. The mean birth weight of children in the study was 3.1 ± 0.6 kg. It was 3.1 ± 0.7 , 3.3 ± 0.6 , and 2.9 ± 0.5 for Ekiti, Oyo and Ogun State respectively.

Also, the distribution of participants according to the position of the child in the family depicted that there was disparity among the three states, even though they all had a higher proportion of children who were the first position in their family (39.9%, 33.8%, and 41.0% for Ekiti, Oyo and Ogun State respectively).

The cumulative mortality rate (CMR) for under-five children in the study was 52 per 1000 live birth, with Ogun and Oyo State having the highest (68.4) and lowest (19.2) respectively. The rural settlement had the highest mortality rate (53.6) compared to the urban settlement (49.1).

The main causes of under-five deaths as shown in figure 3a were malaria (28.0%), pneumonia (23.4%), diarrhoea (13.1%), congenital complications (10.3%), measles (9.3%), accident (1.9%), cholera (1.9%) and data not available (1.9%).

Classification of Children into Experimental and Control Groups: There was no significant difference in the demographic and physical characteristics of the under-five children between the experimental and control groups as shown in table 4.3b.

Figure 4.3b showed that there was no significant difference in the causes of child mortality among under-five children between the experimental and control groups.

Table 4.3a: Demographic and Physical Characteristics of the Children

Characteristics		Residence			State		Total
		Urban (%)	Rural (%)	Ekiti (%)	Oyo (%)	Ogun (%)	
Age of children (months)	6-11	138 (13.8)	73 (23.8)	72 (16.9)	97 (22.2)	42 (9.5)	211 (16.1)
	12-23	227 (22.7)	77 (25.1)	126 (29.6)	93 (21.2)	85 (19.1)	304 (23.2)
	24-35	263 (26.3)	61 (19.9)	98 (23.0)	94 (21.5)	132 (29.7)	324 (24.8)
	36-47	233 (23.3)	53 (17.2)	75 (17.6)	89 (20.3)	122 (27.5)	286 (21.9)
	48-59	140 (13.9)	43 (14.0)	55 (12.9)	65 (14.8)	63 (14.2)	183 (14.0)
	Mean, SD. P<0.05	29.48±14.49 0.000	26.51±15.74	27.20 ±15.09 0.000	28.25±15.91	30.84±13.21	28.79 ± 14.84
Sex of children	Male	514(51.3)	142 (46.3)	204 (47.9)	210 (47.9)	242 (54.5)	656 (50.2)
	Female	487 (48.7)	165 (53.7)	222 (52.1)	228 (52.1)	202 (45.5)	652 (49.8)
	P<0.05	0.067		0.078			
Birth weight of children	<2.5 (LBW)	81 (12.6)	27 (13.5)	42 (18.2)	22 (7.1)	42 (14.4)	108 (12.8)
	≥ 2.5	560 (87.4)	173 (86.5)	198 (81.8)	286 (92.9)	249 (85.6)	733 (87.2)
	Mean, SD.	3.08±0.63	3.06±0.60	3.07 ± 0.71	3.27±0.61	2.88±0.47	3.08±0.62
	Missing	641(64.0)	200 (65.1)	240 (56.3)	308 (70.3)	291(65.5)	841 (64.3)
	P<0.05	0.416		0.000			
Position of child in the family	First	387 (38.7)	113 (36.8)	170 (39.9)	148 (33.8)	182 (41.0)	500 (38.2)
	Second	284 (28.3)	78 (25.4)	105 (24.7)	118 (26.9)	139 (31.3)	362 (27.7)
	Third	159 (15.9)	50 (16.3)	67 (15.7)	77 (17.6)	65 (14.6)	209 (16.0)
	Fourth	103 (10.3)	36 (11.7)	46 (10.8)	54 (12.3)	39 (8.8)	139 (10.6)
	Five & above	68 (6.8)	30 (9.8)	38 (8.9)	41 (9.4)	19 (4.3)	98 (7.5)
	P<0.05	0.377		0.010			
CMR	Under-5	49.1	53.6	59.8	19.5	68.4	50.2
Height(cm)	Mean, SD.	86.57±28.24	83.86±13.02	83.71±13.66	86.19±40.26	87.81±11.62	85.93±25.52
Weight(kg)	Mean, SD.	12.58±4.60	12.49±7.40	12.70±8.20	12.24±3.57	12.74±2.89	12.56 ± 5.38
MUAC(cm)	Mean, SD.	14.95±2.32	14.63±1.29	14.73±1.40	14.77±1.33	15.12±3.11	14.87±2.13
Total	Total	1001 (76.5)	307 (23.5)	426 (32.6)	438 (33.5)	444 (33.9)	1308 (100)

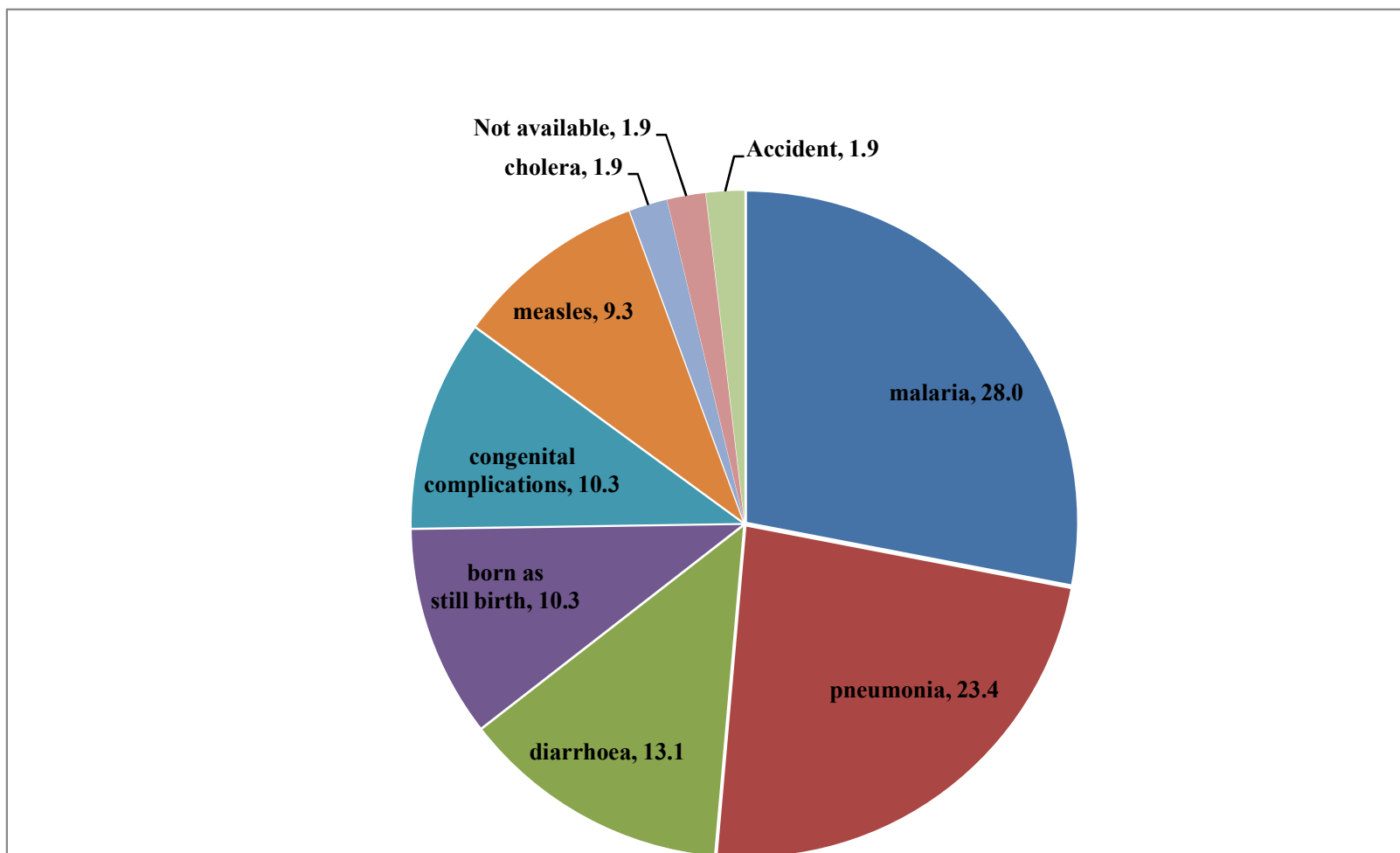


Figure 4.3a: Causes of under-five mortality in the Study

Table 4.3b: Demographic and Physical Characteristics of the Children

Characteristics		Group		Total (%)
		Experimental (%)	Control (%)	
Age of children (months)	6-11	46 (15.4)	35 (11.7)	81 (13.5)
	12-23	67 (22.4)	72 (24.1)	139 (23.2)
	24-35	68 (22.7)	76 (25.4)	144 (24.1)
	36-47	64 (21.4)	73 (24.4)	137 (22.9)
	48-59	54 (18.1)	43 (14.4)	97 (16.2)
	Mean, SD. P<0.05	30.10±15.71 0.412	30.16±14.63	30.13 ±15.17 0.000
Sex of children	Male	148 (49.5)	147 (49.2)	295 (49.3)
	Female	151 (50.5)	152 (50.8)	303 (50.7)
	P<0.05	0.500		
Birth weight of children	<2.5 (LBW)	41 (15.7)	41 (16.2)	82 (16.0)
	≥ 2.5	220 (84.3)	212 (83.8)	432 (84.0)
	Mean, SD.	3.16±0.63	3.07±0.66	3.11 ± 0.64
	Total	261(87.3)	253 (84.6)	514 (85.8)
	Missing	38 (12.7)	46 (15.4)	85 (14.2)
	P<0.05	0.488		
The position of the child in the family	First	110 (36.8)	113 (37.8)	223 (37.3)
	Second	81 (27.1)	88 (29.4)	169 (28.3)
	Third	56 (18.7)	46 (15.4)	102 (17.1)
	Fourth	34 (11.4)	32 (10.7)	66 (11.0)
	Five & above	18 (6.0)	20 (6.7)	38 (6.4)
	P<0.05	0.831		
CMR	Under-5	46.2	51.4	48.9
Height(cm)	Mean, SD.	86.18±12.84	85.82±14.17	86.00±13.51
Weight(kg)	Mean, SD.	12.78±6.17	12.62±3.27	12.70±4.93
MUAC(cm)	Mean, SD.	14.86±1.43	15.08±3.67	14.97±2.78
Total	Total	299 (50.0)	299 (50.0)	598 (100)

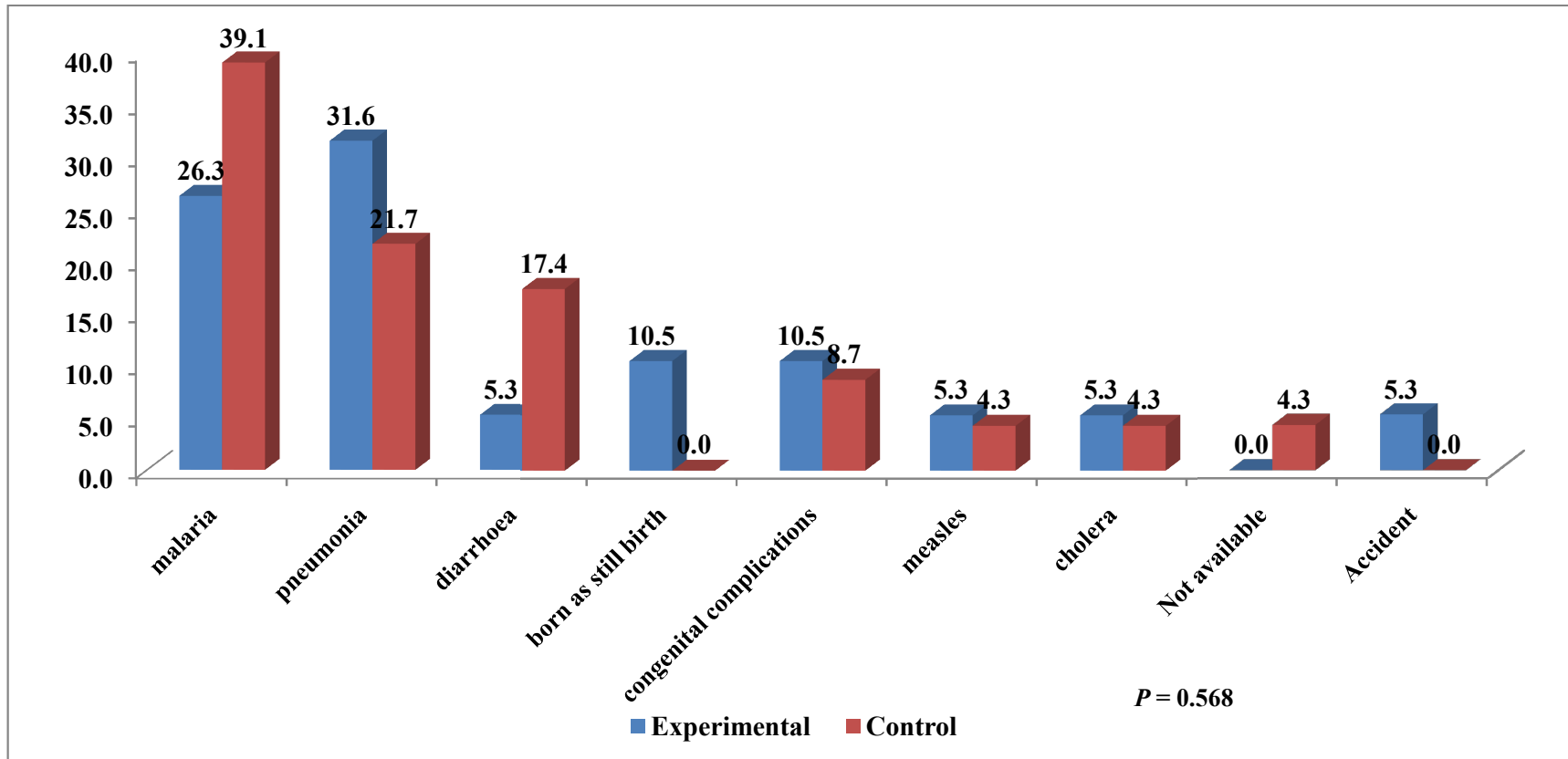


Figure 4.3b: Comparison of the causes of under-five mortality between experimental and control groups

4.4 Household Physical Characteristics and Socioeconomic Status of Respondents

Table 4.4a revealed that majority (89.6% and 67.0%) of the respondents had access to electricity and improved source of water. About 67% of the respondents do not use appropriate water treatment methods. A large proportion (69.1%) of households used unimproved toilet facilities and 59.1% do not dispose of their refuse using appropriate methods. Kerosene was used as the main source of cooking energy (71.7%). Most of the participants (94.3%) lived in houses with the finished or polished floor (cement, ceramic tiles, carpet and so on) and 93.8% lived in houses with finished roofs (zinc, ceramic tiles, polished wood and so on)

A significant difference in water treatment methods, the primary method of refuse disposal and energy source for cooking was observed when the respondents were classified according to the urban-rural residence and the state they lived in. Primary sources of drinking water and primary energy source was significantly different between urban and rural residence, while the types of toilet facility and the main materials for flooring was significantly different among the three states.

Socioeconomic Status

The distribution of household according to their socioeconomic status is shown in Figure 4.4a. The socioeconomic status was obtained from information on the household asset through principal components analysis used to produce a common factor score for each of the households. Mothers were ranked according to the total score of the household in which they resided as generated through the principal component analysis. The sample was divided into 3 quintiles from one (lowest: -9 to -3) to three (highest: 4-9). A large (50.2%) proportion of the respondents in the study were from the low SES. The urban area has a higher proportion of people in the middle (43.1%) and highest (10.6%) socio-economic status. On the other hand, the rural residence has a higher proportion of the population in the lower quintile (62.5%) as compared to 46.4% in the urban setting. There was also a significant difference among the states; Oyo State had the lowest proportion of people in the lower (42.5%) and upper SES (4.8%). Ekiti and Ogun State has the highest proportion of people in the lowest (56.8%) and highest (13.3%) socio-economic status respectively.

Classification of Respondents into Experimental and Control Groups: the classification of respondents into experimental and control groups revealed that there was no significant difference ($p < 0.05$) in household physical characteristics of respondents between the experimental and control groups as shown in table 4.4b

Table 4.4a: Household Physical Characteristics of Respondents

Household characteristics		Residence			State		Total (%)
		Urban (%)	Rural(%)	Ekiti (%)	Oyo (%)	Ogun (%)	
Primary sources of drinking water	Non-improved	290 (29.0)	141 (45.9)	161 (37.8)	133 (30.4)	137 (30.9)	431 (33.0)
	Improved sources	711 (71.0)	166 (54.1)	265 (62.2)	305 (69.6)	307 (69.1)	877 (67.0)
	P<0.05	0.000		0.35			
Water treatment methods	Non / Inappropriate	695 (69.4)	175 (57.0)	259 (60.8)	233 (53.2)	378 (85.1)	870 (66.5)
	Appropriate	306 (30.6)	132 (43.0)	167 (39.2)	205 (46.8)	66 (14.9)	438 (33.5)
	P<0.05	0.000		0.000			
Toilet facility	Non-improved	683 (68.2)	221 (72.0)	334 (78.4)	335 (76.5)	235 (52.9)	904 (69.1)
	Improved	318 (31.8)	86 (28.0)	92 (21.6)	103 (23.5)	209 (47.1)	404 (30.9)
	P<0.05	0.120		0.000			
Primary method of refuse disposal	Improper	488 (48.8)	285 (92.8)	292 (68.5)	240 (54.8)	241 (54.3)	773 (59.1)
	Proper	513 (51.2)	22 (7.2)	134 (31.5)	198 (45.2)	203 (45.7)	535 (40.9)
	P<0.05	0.000		0.000			
Primary energy source for cooking	Charcoal/wood/ stray	36 (3.6)	92 (30.0)	55 (12.9)	10 (2.3)	63 (14.2)	128 (9.8)
	Kerosene	764 (76.3)	174 (56.6)	312 (73.2)	359 (82.0)	267 (60.1)	938 (71.7)
	Electricity	17 (1.7)	7 (2.3)	11 (2.6)	8 (1.8)	5 (1.1)	24 (1.8)
	Gas	184 (18.4)	34 (11.1)	48 (11.3)	61 (13.9)	109 (24.6)	218 (16.7)
	P<0.05	0.000		0.000			
Primary energy source	No electricity	71 (7.1)	65 (21.2)	43 (10.1)	33 (7.5)	60 (13.5)	136 (10.4)
	Electricity	930 (92.9)	242 (78.8)	383 (89.9)	405 (92.5)	384 (86.5)	1172 (89.6)
	P<0.05	0.000		0.014			
Main material for flooring	Natural floor	61 (6.1)	14 (4.6)	61 (14.3)	3 (0.7)	11 (2.5)	75 (5.7)
	Finished floor	940 (93.9)	293 (95.4)	365 (85.7)	435 (99.3)	433 (97.5)	1233 (94.3)
	P<0.05	0.193		0.000			
Main material for roofing	Natural roof	65 (6.5)	16 (5.2)	57 (13.4)	8 (1.8)	16 (3.6)	81 (6.2)
	Finished floor	936 (93.5)	291 (94.8)	369 (86.6)	430 (98.2)	428 (96.4)	1227 (93.8)
	P<0.05	0.252		0.000			
Total	Number (total)	1001 (76.5)	307 (23.5)	426 (32.6)	438 (33.5)	444 (33.9)	1308 (100)

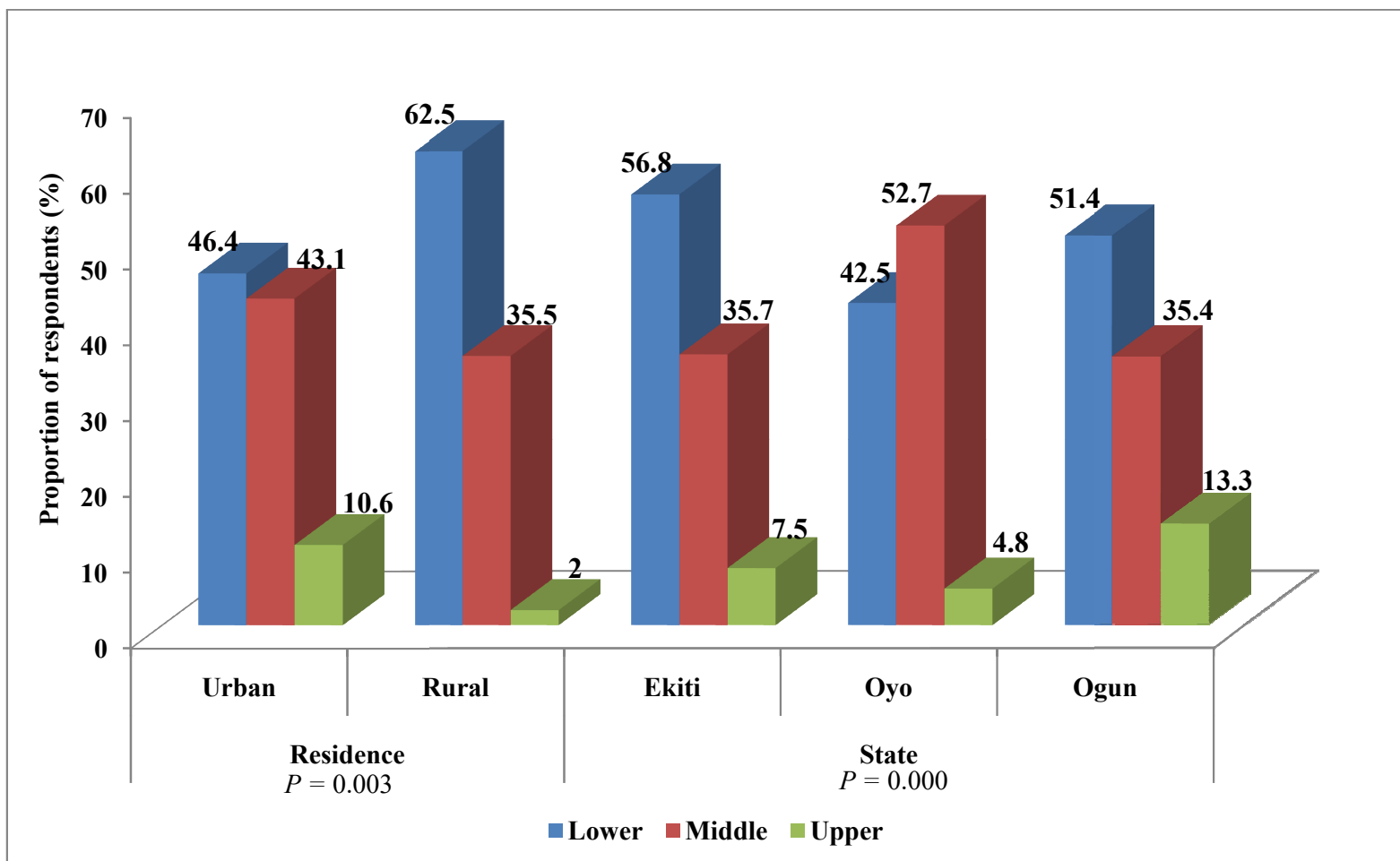


Figure 4.4: Socioeconomic status of the household.

Table 4.4b: Household Physical Characteristics of Respondents

		Group		Total (%)
		Experimental (%)	Control (%)	
Household characteristics				
Primary sources of drinking water	Non-improved	102 (34.1)	102 (34.1)	204 (34.1)
	Improved sources	197 (65.9)	197 (65.9)	394(65.9)
	P<0.05		0.534	
Water treatment methods	Non / Inappropriate	191(63.9)	208 (69.6)	399 (66.7)
	Appropriate	108 (36.1)	91 (30.4)	199 (33.3)
	P<0.05		0.082	
Toilet facility	Non-improved	214(71.6)	209 (69.9)	423 (70.7)
	Improved	85(28.4)	90 (30.1)	175 (29.3)
	P<0.05		0.360	
Primary method of refuse disposal	Improper	179 (59.9)	177 (59.2)	356 (59.5)
	Proper	120 (40.1)	122 (40.8)	242 (40.5)
	P<0.05		0.467	
Primary energy source for cooking	Charcoal/wood/ stray	30 (10.0)	32 (10.7)	62 (10.4)
	Kerosene	221 (73.9)	208 69.6)	429 (71.7)
	Electricity	8 (2.7)	7 (2.3)	15 (2.5)
	Gas	40 (13.4)	52 (17.4)	92 (15.4)
	P<0.05		0.554	
Primary energy source	No electricity	39 (13.0)	31(10.4)	70 (11.7)
	Electricity	260 (87.0)	268 (89.6)	528 (88.3)
	P<0.05		0.187	
Main material for flooring	Natural floor	22 (7.4)	18 (6.0)	40 (6.7)
	Finished floor	277 (92.6)	281 (94.0)	558 (93.3)
	P<0.05		0.193	
Main material for roofing	Natural roof	21 (7.0)	21 (7.0)	42 (7.0)
	Finished floor	278 (93.0)	278 (93.0)	556 (93.0)
	P<0.05		0.563	
Socioeconomic status of the household	Low	151 (50.5)	144 (48.2)	295 (49.3)
	Middle	119 (39.8)	129 (43.1)	248 (41.5)
	Upper	29 (9.7)	26 (8.7)	55 (9.2)
	P<0.05		0.693	
Total	Number (total)	299 (50.0)	299 (50.0)	598 (100.0)

4.5. Factors influencing the survival of under-five children in the study area at baseline

Logistic regressions were performed to ascertain the factors influencing the survival of under-five children in South-west Nigeria. The model was statistically significant, $\chi^2 (4) = 95.171$, $p < .005$, and explained 15.1% (Nagelkerke R^2) of the variance in child survival in the study and correctly classified 90.4%. The factors that were significantly ($p < 0.05$) associated with the likelihood of increasing the survival of the under-five children studied were literacy level of the mother, place of residence, low parity, educational qualification of mothers, living in a house with a finished floor, and mothers age at first birth.

The odd of children from literate mothers surviving was 1.85 times higher than children from non-literate mothers given that all other variables in the models were held constant. For the place of residence, the odds of children surviving was 2.24 times higher in urban than the rural residence, given that all other variables in the model remained constant. For parity, it was an inverse relationship indicating that the likelihood of a child surviving was greater among mothers with fewer (low parity) numbers of children. Under-five children from mothers with at least a secondary education were more likely (1.02 times) to survive than children from uneducated mothers. Households with Finished/polished floors were 4.30 times more likely to survive than those from a household with natural floors. Mothers' age at first birth was also a significant factor that increased the likelihood of child survival in the study.

Table 4.5: Factors determining the survival of under-five children in the study areas at baseline

Factors	Categories	B	Sig.	Odd ratio (Exp. B)	95% C.I.	
					Lower	Upper
Literacy level Mothers	Unable to read			1.000		
	Mother's ability to read	.617	.003	1.854	1.240	2.771
Residence	Rural			1.000		
	Urban	.806	.036	2.240	1.053	4.765
Parity	1-2 children (Ref)			1.000		
	3-4 children	-.729	.016	.483	.267	.871
	>4 children	-.172	.580	.842	.458	1.549
Educational qualification of mother	not educated (Ref)			1.000		
	Primary	.392	.437	1.480	.551	3.978
	At least secondary	.751	.001	2.120	1.342	3.348
Educational qualification of father	not educated (Ref)			1.000		
	Primary	.133	.810	1.142	.387	3.374
	At least secondary	.023	.945	1.023	.536	1.952
The main material of the floor)	Natural Floors			1.000		
	Finished/polished floors	1.459	.000	4.303	2.269	8.159
Socio-economic status of the household	Socio-economic status	.028	.735	1.028	.875	1.209
Age of mothers at first birth	age at first birth	0.069	0.007	1.071	1.019	1.125
Employment status of the mother	Not employed			1.000		
	Employed	.551	.111	1.735	.882	3.412

Note: Ref = reference

4.6. Level of uptake of child survival interventions in the study

Table 4.6 showed the level of uptake of child survival interventions in the study. The respondents were classified according to their place of residence and the state they lived in. The majority (90.7%) of the respondents were assisted during delivery by skilled health personnel with the highest (93.5%) from Ogun State. Seventy-two percent of the respondents initiated breastfeeding within one hour of birth with Oyo State having the highest proportion (75.3%). Only 19.3% of the under-five children were exclusively breastfed with Oyo State (24.9%) having the highest rate. About 19.6% of the children were introduced to complementary food at six months old and Oyo State has the highest rate (25.1%). A large proportion of the children (76%) received vitamin A supplementation within the last 6 months with Oyo State having the highest percentage (87.4).

A large proportion (78.6% and 86.5%) of children one-year-old received measles and were also protected against neonatal tetanus through immunisation of their mothers with Ekiti and Oyo State having the highest proportion (82.5%, 95.7%) respectively. Table 4.6a revealed that 27.2% of children less than five years were reported to have had diarrhoea two weeks before the survey with Oyo State having the highest percentage (43.1%). About 67.1% of the children with the diarrhoea episode were treated with ORT.

Table 4.6a also revealed the percentage of children less than five years who experienced symptoms of acute respiratory infection (ARI) in the two weeks preceding the study. Pneumonia is the most serious outcome of ARI in young children. It is among the leading causes of childhood morbidity and mortality. A large proportion of deaths caused by pneumonia can be prevented by early diagnosis and treatment with antibiotics. The prevalence of ARI symptoms among the children was based on the occurrence of illness with a cough accompanied by short, rapid breathing in the two weeks preceding the study (NDHS, 2013). About 36% of the children showed ARI symptoms during the two weeks before the study. Respondents sought advice or treatment from a health facility or health provider (appropriate treatment) for 72.2% of the children with ARI symptoms.

All respondents were asked if they had a mosquito net and slept under it the night preceding the survey. About 44.6% of households in the study possessed mosquito net. Only 36 percent of the study population with LLIN, slept under a mosquito net the night preceding the study. About 35% of under-five children slept under LLIN the night preceding the survey. A large proportion of households with LLIN (64.0%) did not sleep under it the night before the survey. There was significant difference $p < 0.05$ between the urban and rural residence in complementary feeding practices, uptake of TT, Proportion of children 0-59 months of age who had suspected pneumonia 2 weeks before the survey and were taken to an appropriate health care provider. The study revealed that urban areas had a higher proportion of children introduced to complementary food at 6 months and children protected against neonatal tetanus compared to the rural areas.

Classification of respondents into the different states they lived showed a significant difference ($p < 0.05$) in the uptake of child survival interventions among the states. There was a significant difference in the proportion of mothers that delivered through skilled health workers, initiated Breastfeeding within one hour of birth, practiced exclusive breastfeeding, practiced complementary feeding, Uptake vitamin A supplementation, TT, measles, appropriate care for diarrhoea and suspected pneumonia, and the use of LLIN among the states.

Ekiti State had the highest proportion of under-five children who were immunised against measles and neonatal tetanus, Oyo State had the highest under-five children who were exclusively breastfed for 6 months, initiated to breastfeeding within one hour of birth, introduced to adequate complementary food from 6 months, supplemented with vitamin A, given appropriate treatment for diarrhoea and suspected pneumonia and those that slept under LLIN. Ogun State had the highest proportion of deliveries assisted by skilled health personnel and had the lowest level of uptake of other interventions while Ekiti State had the lowest proportion of deliveries assisted by skilled personnel.

Classification of respondents into the experimental and control group:

Table 4.6b showed that there was no significant difference between the experimental and control groups in the uptake of child survival interventions at baseline with the exception of children protected against neonatal tetanus. The experimental group had a higher proportion of children (94.0%) protected against neonatal tetanus at baseline than the control group (80.6).

Table 4.6a: Level of uptake of child survival interventions in the study

Survival Interventions	Categories	Place of residence		State			Total (%)
		Urban (%)	Rural (%)	Ekiti (%)	Oyo (%)	Ogun (%)	
Assisted delivery by skilled health personnel	Skilled health personnel	908 (90.7)	279(90.9)	364(85.4)	408(93.2)	415(93.5)	1187 (90.7)
	Unskilled	93 (9.3)	28 (9.1)	62(14.6)	30 (6.8)	29(6.5)	121 (9.3)
	P<0.05	0.515		0.000			
Initiation of breastfeeding within one hour of birth (% of Infants < 12 months)	≤1 hour	98 (71.0)	55 (75.3)	45(62.5)	77(79.4)	31(73.8)	153 (72.5)
	>1 hour	40 (29.0)	18 (24.7)	27(37.5)	20(20.6)	11(26.2)	58 (27.5)
	Total (6 -11months)	138 (13.8)	73 (23.8)	77(21.9)	97(22.2)	42(9.5)	211 (16.1)
	P<0.05	0.185	0.727	0.003	0.891	0.189	
Exclusive breast feeding (EBF)	Exclusively breast fed	196 (19.6)	57 (18.6)	79(18.5)	109(24.9)	65 (14.6)	253 (19.3)
	Non exclusively	805 (80.4)	250(81.4)	347(81.5)	329(75.1)	379 (85.4)	1055 (80.7)
	P<0.05	0.381		0.000			
Complementary feeding practices	<4 months	427 (42.7)	155(50.5)	206(48.4)	130(29.7)	246 (55.4)	582(44.5)
	4 months	160 (16.0)	60 (19.5)	101(23.7)	91(20.8)	28(6.3)	220(16.8)
	5 months	82 (8.2)	21 (6.8)	21 (4.9)	67 (15.3)	15 (3.4)	103 (7.9)
	6 months	200 (20.0)	57(18.6)	79(18.5)	110(25.1)	68 (15.3)	257 (19.6)
	>6 months	132 (13.2)	14 (4.6)	19 (4.5)	40 (9.1)	87 (19.6)	146 (11.2)
	P<0.05	0.001					
Children 6-59 months old that received vitamin A in the past 6 months	Did not receive	257 (25.7)	60 (19.5)	95 (22.3)	55 (12.6)	167 (37.6)	317 (24.2)
	Received	744 (74.3)	247(80.5)	331(77.7)	383(87.4)	277 (62.4)	991 (75.8)
	P<0.05	0.160		0.000			
Children immunised against measles (% one-year-old)	Yes	179 (78.9)	60 (77.9)	104 (82.5)	69 (74.2)	66 (77.6)	239 (78.6)
	No	38 (16.7)	15 (19.5)	20 (15.9)	17 (18.3)	16 (18.8)	53 (17.4)
	Non applicable/available	10 (4.4)	2 (2.6)	2 (1.6)	7 (2.2)	3(3.5)	12 (4.0)
	Total (12-23 months)	227 (22.7)	77 (25.1)	126 (29.6)	93 (21.2)	85 (19.1)	304 (23.2)
	P<0.05	0.694		0.125			
Total	Number 6-59 months	1001(76.5)	307 (23.5)	426 (32.6)	438 (33.5)	444 (33.9)	1308 (100)

Table 4.6a continued: Level of uptake of child survival interventions in the study

Survival Interventions	Categories	Place of residence			State		Total (%)
		Urban (%)	Rural (%)	Ekiti (%)	Urban (%)	Rural (%)	
Children protected against neonatal tetanus (% of one-year-old)	Yes	199 (87.7)	64 (83.1)	100 (79.4)	89 (95.7)	74(87.1)	263 (86.5)
	No	28 (12.3)	13 (16.9)	26 (20.6)	4 (4.3)	11(12.9)	41 (13.5)
	Total (12-23months)	227 (22.7)	77 (25.1)	126 (29.6)	93 (21.2)	85 (19.1)	304 (23.2)
	P<0.05			0.000			0.002
Children 0-59 months with diarrhoea within the previous 2 weeks, treated with ORT	Yes	180 (67.9)	59 (64.8)	59 (59.6)	145(76.7)	35(51.5)	239 (67.1)
	No	85 (32.1)	32 (35.2)	40 (40.4)	44(23.3)	33(48.5)	117 (32.9)
	Total	265 (26.5)	91 (29.6)	99 (23.2)	189(43.1)	68(15.3)	356 (27.2)
	Not applicable	736 (73.5)	216 (70.4)	327(76.8)	249(56.9)	376(84.7)	952 (72.8)
P<0.05			0.472			0.000	
Children 0-59 months with suspected pneumonia within the previous 2 weeks, taken to the appropriate health-care provider	Appropriate	248(73.2)	94(69.6)	103(58.2)	198(88.8)	41 (55.4)	342(72.2)
	Not appropriate	91(26.8)	41 (30.4)	74(41.8)	25 (11.2)	33 (44.6)	132(27.8)
	Total	339 (33.9)	135 (44.0)	177(41.5)	223(50.9)	74 (16.7)	474(36.2)
	Not applicable	662 (66.1)	172 (56.0)	249(58.5)	215(49.1)	370 (83.3)	834(63.8)
P<0.05			0.011			0.000	
Children 0-59 months that slept underan insecticide-treated net the previous night	Under-five & mother	336(33.6)	119(38.8)	157(36.9)	196(44.7)	102(23.0)	455 (34.8)
	Others	11(1.1)	5(1.6)	6(1.4)	7(1.6)	3 (0.7)	16 (1.2)
	HH not using LLIN	654 (65.3)	183(59.6)	263(61.7)	235(53.7)	339(76.3)	837 (64.0)
	P<0.05			0.168			0.000
P<0.05			0.000			0.000	
Total	Number 6-59 months	1001 (76.5)	307 (23.5)	426 (32.6)	438 (33.5)	444 (33.9)	1308 (100)

*HH- Household, LLIN-Long lasting insecticide net, ORT- oral rehydration therapy

Table 4.6b: Level of uptake of child survival interventions in the experimental and control group at baseline

Survival Interventions	Categories	Group		Total	
		Experimental (%)	Control (%)		
Assisted delivery by skilled health personnel	Skilled health Personnel	277 (92.6)	271(90.6)	548 (91.6)	
	Unskilled P<0.05	22 (7.4) 0.230	28 (9.4)	50 (8.4) 0.000	
Initiation of breastfeeding within one hour of birth (% of Infants < 12 months)	≤1 hour	34 (73.9)	26 (74.3)	60 (74.1)	
	>1 hour	12 (26.1)	9 (25.7)	21 (25.9)	
	Total (6 -11months) P<0.05	46 (15.38) 0.588	35 (11.71)	81 (13.55)	
Exclusive breast feeding (EBF)	Exclusively breast fed	54 (18.1)	54 (18.1)	108 (18.1)	
	Non exclusively P<0.05	245 (81.9) 0.541	245 (81.9)	490 (81.9)	
Complementary feeding practices	<4 months	72 (24.1)	68 (22.7)	140 (23.4)	
	4 months	38 (12.7)	43 (14.4)	81 (13.5)	
	5 months	33 (11.0)	34 (11.4)	67 (11.2)	
	6 months	94 (31.4)	97 (32.4)	191 (31.9)	
	>6 months P<0.05	62 (20.7) 0.952	57 (19.1)	119 (19.9)	
Children 6-59 months old that received vitamin A in the past 6 months	Did not receive	70 (23.4)	75 (25.1)	145 (24.2)	
	Received P<0.05	229 (76.6) 0.351	224 (74.9)	453 (75.8)	
Children immunised against measles (% one-year-old)	Yes	53 (79.1)	54 (75.0)	107 (77.0)	
	No	12 (17.9)	15 (20.8)	27 (19.4)	
	Non applicable/available	2 (3.0)	3 (4.2)	5 (3.6)	
	Total (12-23 months) P<0.05	67 (22.4) 0.834	72 (24.1)	139 (23.24)	
Children protected against neonatal tetanus (% of one-year-old)	Yes	63 (94.0)	58 (80.6)	121 (87.1)	
	No	4 (6.0)	14 (19.4)	18 (12.9)	
	Total (12-23months) P<0.05	67 (22.4) 0.016	72 (24.1)	139 (23.24)	
Total	Number months	6-59	299 (50.0)	299 (50.0)	598 (100.0)

Table 4.6bcontinued: Level of uptake of child survival interventions in the experimental and control group at baseline

Survival Interventions	Categories	Group		Total
		Experimental (%)	Control (%)	
Children 0-59 months with diarrhoea within the previous 2 weeks, treated with ORT	Yes	53 (56.4)	52 (70.3)	105 (62.5)
	No	41 (43.6)	22 (29.7)	63 (37.5)
	Total	94 (31.4)	74 (24.7)	168 (28.1)
	Not applicable	205 (68.6)	225 (75.3)	430 (71.9)
	P<0.05	0.045		
Children 0-59 months with suspected pneumonia within the previous 2 weeks, taken to the appropriate health-care provider	Appropriate	81 (27.1)	67 (22.4)	148 (24.7)
	Not appropriate	30 (10.0)	35 (11.7)	65 (10.9)
	Total children	111 (37.1)	102 (34.1)	213 (35.6)
	Not applicable	188 (62.9)	197 (65.9)	385 (64.4)
	P<0.05	0.383		
Children 0-59 months that slept under insecticide-treated net the previous night	Under-five & mother	108 (36.1)	100 (33.4)	208 (34.8)
	Others	3 (1.0)	6 (2.0)	9 (1.5)
	HH not using LLIN	188 (62.9)	193 (64.5)	381 (63.7)
	P<0.05	0.503		
	Total	Number 6-59 months	299 (50.0)	299 (50.0)

*HH- Household, LLIN-Long lasting insecticide net, ORT- oral rehydration therapy

4.7: Factors causing the differences observed in child survival indicators among the sampled states in South-west Nigeria

Table 4.7 revealed the factors causing differences in child survival indicators among the states. Multiple regressions were performed to investigate the causes of the difference in child survival indicators among the sampled states in South-west Nigeria. The model was statistically significant $p < 0.05$ and explained 12.2% (coefficient of determination R^2) of the variance in child survival among the states.

Six variables (socioeconomic status, literacy level of mothers, water treatment method, building materials, availability of health center / hospital in the community and use of available services in the health centre) which were statistically significant ($p < .05$) predicted the causes of the differences observed in the child survival indicators among the states $F(7, 1299) = 25.878, p < .0005, R^2 = 0.122$.

Table 4.7: Factors causing the differences observed in child survival indicators among the sampled states in South-west Nigeria

Factors	Coefficients (B)	Sig.	95% CI for B	
			Lower Bound	Upper Bound
(Constant)	4.445	.000	4.043	4.848
Socioeconomic status	.175	.015	.033	.316
Literacy level	.450	.000	.229	.670
Water treatment method	.594	.000	.399	.789
Main material of the wall	.577	.000	.266	.889
Availability of health center / hospital in the community	.442	.000	.201	.683
Use of available services in the health center	.393	.000	.229	.558
Distance of health center	.125	.174	-.055	.304

4.8: Nutritional Status of Children in the study

The study showed the coexistence of under-nutrition and over-nutrition among the under-five children studied. The prevalence of wasting, underweight and stunting among the children were 4.8%, 8.4%, and 18.3% respectively. The prevalence of overweight and obesity among the under-five children studied were 12.3% and 13.5% respectively. A total of 4.7%, 8.0%, 20.0% of children from Ekiti, 5.0%, 8.4%, 14.4%, from Oyo and 4.7%, 8.8%, 20.5% from Ogun State were wasted, underweight and stunted respectively. The prevalence of overweight and obesity among the children were 9.2% and 9.6% of children from Ekiti, 13.1% and 13.5% from Oyo and 14.6% and 17.1% from Ogun State respectively. The classifications were based on the new WHO growth standard for under-five children.

The pattern differs significantly ($p < 0.05$) among the three states. There was a significant difference in the rate of wasting, stunting, overweight and obesity among the states. However, there was no significant difference in the rate of underweight among the states. Oyo State had the highest prevalence of wasting, while Ogun State had the highest prevalence of stunting, overweight, and obesity among the children. Doing multiple comparisons among the states showed a significant difference between Oyo and Ogun in the rate of stunting between the states (P -value = 0.017) and Ekiti and Ogun States (p -value = 0.030)

Classifying the children according to the place of their residence revealed that there was a significant difference in the prevalence of Wasting (p -value = 0.025), underweight (p -value = 0.017), stunting (p -value = 0.035) and obesity (p -value = 0.036) among the children from urban and rural areas. Wasting, underweight and stunting was higher among children from rural areas while overweight and obesity were higher among children from urban settlements.

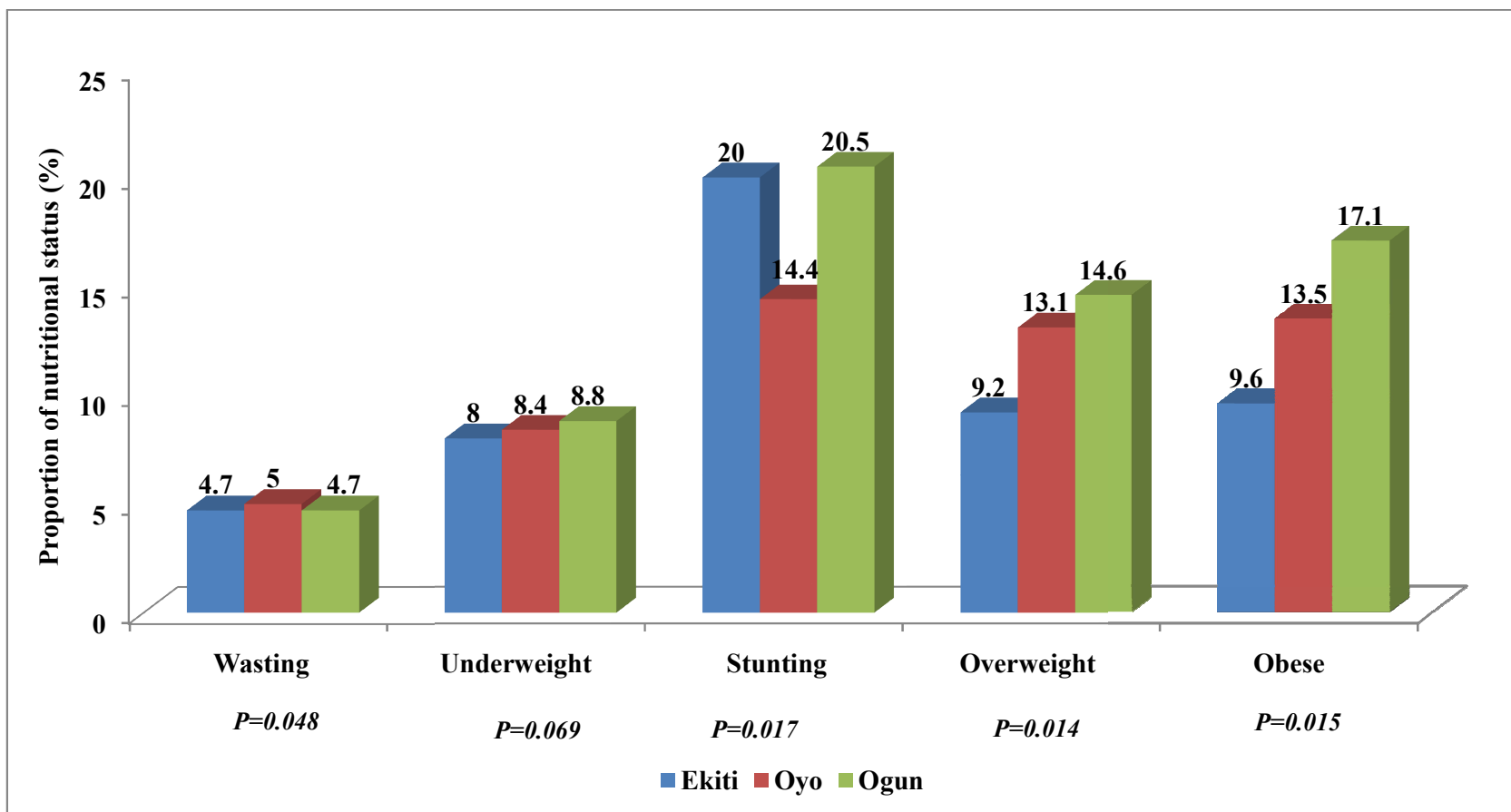


Figure 4.5a: Nutritional status of children in the study (classification according to state).

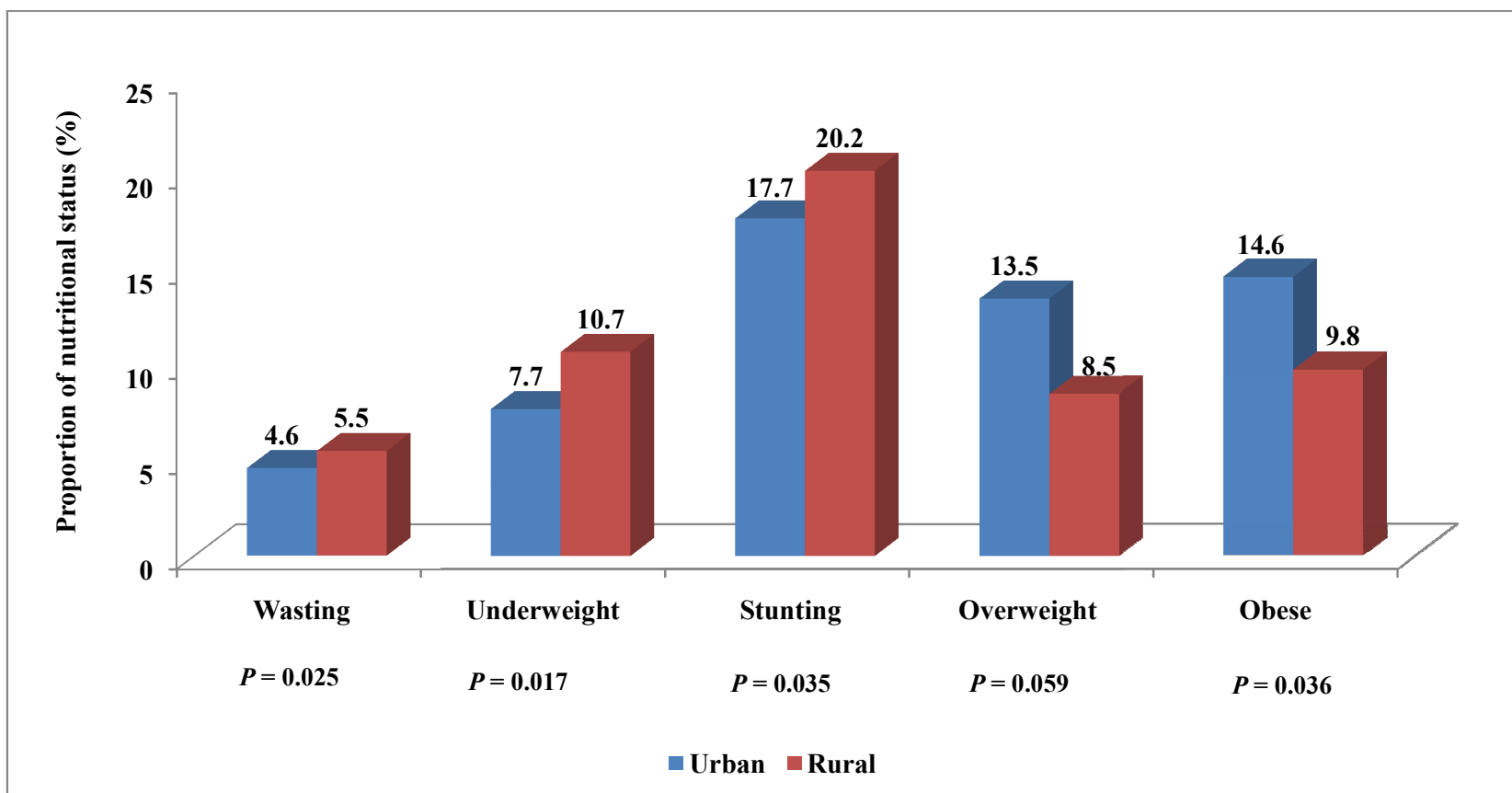


Figure 4.5b: Nutritional status of children in the study (classification according to the place of residence (Rural / Urban)).



Normal child (BMI = 0.01 Z-score) Wasted child (WHZ = -2.45 z-score)



Stunted child (HAZ = -2.99 Z-score) Obese child (BMI = 2.87 Z-score)

Figure 4.6: Pictures of normal weight, wasted, stunted and obese children

4.9. Comparison of Nutritional Status of Children in Control and Experimental Groups

The prevalence of under-nutrition, wasting, underweight and stunting among children in the experimental group decreased from 7.3%, 9.3% and 20.6% at baseline to 2.7%, 3.1% and 11.9% at post-intervention respectively. While Overweight and Obesity increased from 10.0% and 12.0% at baseline to 14.2% and 15.9% at post-intervention respectively.

The prevalence of wasting, underweight and stunting decreased at post-intervention in all the states studied. When the children were classified according to their place of residence, the prevalence of wasting, underweight and stunting also decreased among urban and rural dwellers after the intervention. However, the prevalence of overweight and obesity increased among the states and in the urban-rural settlements.

For the control group, the prevalence of wasting increased from 2.4% at baseline to 3.2% at post-intervention. The prevalence of underweight decreased from 8.0% at baseline to 7.6% at post-intervention. Prevalence for stunting (17.1%) however remained the same at both baseline and post-intervention. The prevalence of overweight and obesity increased from 15.1% and 15.5% at baseline to 15.5% and 16.3% at post-intervention respectively.

Table 4.8: Nutritional Status of Children in Control and Experimental Groups

Groups	Categories	Nutritional Status	Residence		State		Total	
			Urban(%)	Rural(%)	Ekiti(%)	Oyo(%)	Ogun(%)	N (%)
Experimental group	Baseline	Wasting	16(6.8)	6(9.0)	8(8.2)	10(9.2)	4(4.3)	22(7.3)
		Underweight	23(9.9)	5(7.5)	10(10.2)	9(8.3)	9(9.6)	28(9.3)
		Stunting	49(21.0)	13(19.4)	21(21.6)	17(15.6)	24(25.5)	62(20.7)
		Overweight	24(10.3)	6(9.0)	5(5.2)	17(15.6)	8(8.5)	30(10.0)
		Obesity	29(12.4)	7(10.4)	7(7.2)	16(14.7)	13(13.8)	36(12.0)
	End of survey	Wasting	8(3.5)	0(0.0)	2(2.1)	4(3.7)	2(2.2)	8(2.7)
		Underweight	8(3.5)	1(1.5)	1(1.1)	6(5.6)	2(2.2)	9(3.1)
		Stunting	29(12.6)	6(9.2)	10(10.6)	15(13.9)	10(10.8)	35(11.9)
Control group	Baseline	Overweight	34(14.8)	8(12.3)	14(14.9)	15(13.9)	13(14.0)	42(14.2)
		Obesity	41(17.7)	7(10.8)	16(16.8)	16(14.8)	16(17.2)	47(15.9)
		Wasting	4(1.9)	2(5.1)	2(2.2)	2(1.9)	2(3.8)	6(2.4)
		Underweight	13(6.1)	7(17.9)	5(5.4)	9(8.4)	6(11.5)	20(8.0)
		Stunting	34(16.0)	9(23.1)	18(19.6)	14(13.1)	11(21.2)	43(17.1)
	End of survey	Overweight	35(16.5)	3(7.7)	11(12.0)	15(14.0)	12(23.1)	38(15.1)
		Obesity	36(17.0)	3(7.7)	11(12.0)	16(15.0)	12(23.1)	39(15.5)
		Wasting	6(2.8)	2(5.1)	4(4.3)	2(1.9)	2(3.8)	8(3.2)
		Underweight	14(6.6)	5(12.8)	4(4.3)	8(7.5)	7(13.5)	19(7.6)
		Stunting	36(17.0)	7(17.9)	17(18.5)	16(15.0)	10(23.3)	43(17.1)
		Overweight	36(17.0)	3(7.7)	9(9.8)	16(15.0)	14(26.9)	39(15.5)
		Obesity	38(17.0)	3(7.7)	10(10.9)	17(15.9)	14(26.9)	41(16.3)

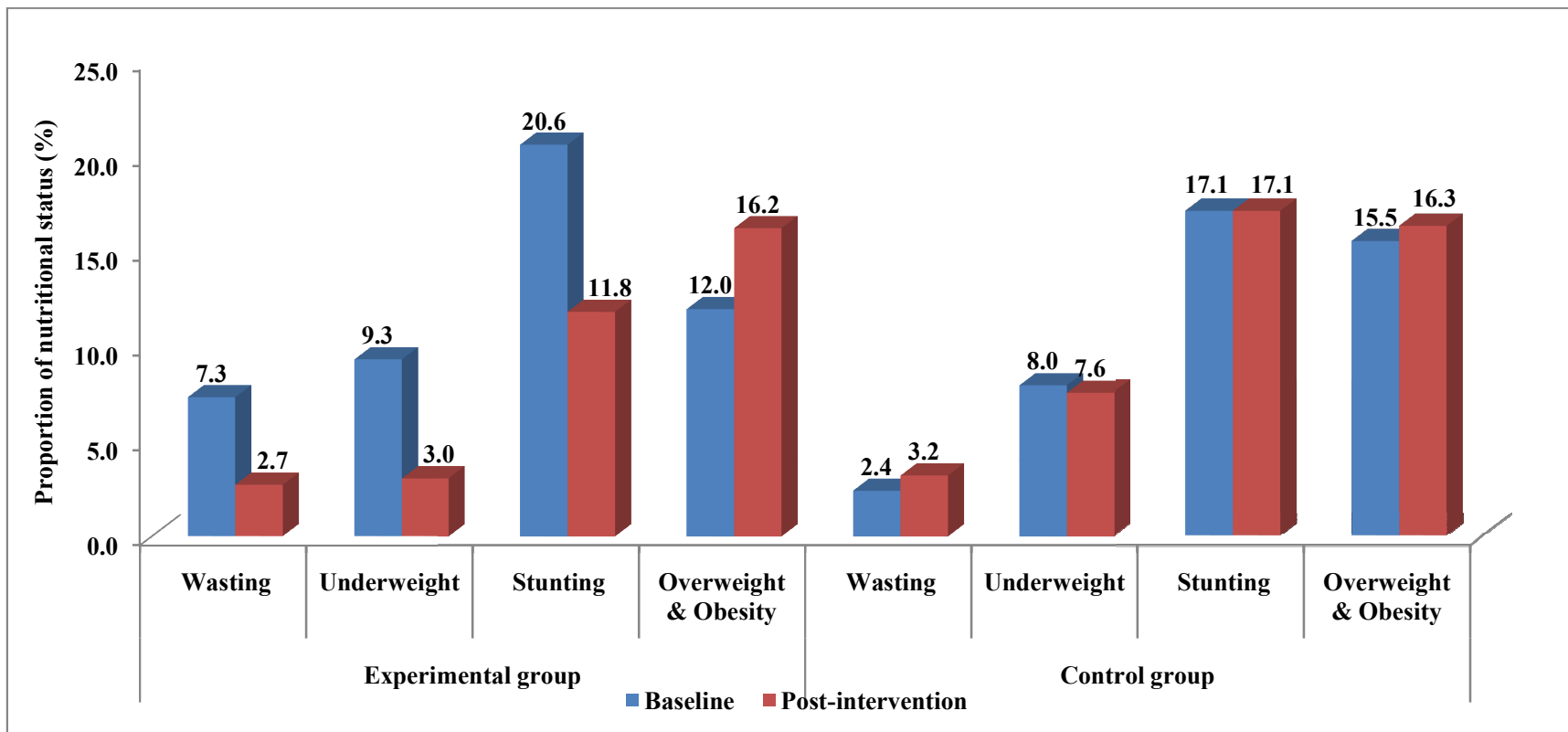


Figure 4.7: Comparison of Nutritional Status of Children in Control and Experimental Groups

4.10: Relationship between uptake of child survival interventions and nutritional status of U-5 children

A multivariate analysis was conducted on the relationship between the uptake of child survival interventions and the nutritional status of children in the study. The analysis revealed that there was an inverse relationship between breastfeeding initiation time and the prevalence of wasting (OR:-0.073), overweight and obesity (OR:-0.074). It was seen that breastfeeding initiation below one hour of birth decreased the probability of becoming wasted or overweight and obese in the study.

It also showed a positive relationship between the uptake of the measles vaccine and underweight and stunting among the children (OR: 0.048). It was seen that as measles vaccination increased the likelihood of children not being underweight and stunted also increased. Thus indicating that the likelihood of children not being underweight or stunted in the study is significantly dependent on their immunisation status i.e. measles vaccination which is an indicator for determining the completeness of child immunisation status.

In the same vein a positive relationship was also observed between children that received appropriate treatment for suspected pneumonia and overweight and obesity in the study (OR:0.062). It was seen that appropriate treatment for suspected pneumonia increased the likelihood of children having a healthy weight.

Table 4.9: Relationship between uptake of child survival interventions and nutritional status of U-5 children

Indicators	Wasting		Underweight		Stunting		Overweight&obesity	
	Coefficients (B)	Sig.	Coefficients (B)	Sig.	Coefficients (B)	Sig.	Coefficients (B)	Sig.
Constant	3.118	.000	2.997	.000	2.816	.000	3.107	.000
Initiation of breastfeeding within one hour of birth (% of one-year-old) **	-.073	.004	-.038	.081	-.035	.187	-.074	.004
EBF for six months	.266	.197	.131	.463	-.223	.302	.263	.207
Children 6-59 months old that received vitamin A in the past 6 months	-.014	.600	-.022	.348	.024	.394	-.015	.590
Children immunised against measles (% of one-year-old) **	-.012	.535	.048	.004	.055	.006	-.011	.583
Children protected against neonatal tetanus (% of one-year-old)	.015	.682	-.003	.929	-.030	.442	.035	.351
Adequate Complimentary feeding practices	-.307	.134	-.155	.381	.228	.287	-.316	.127
Children 0-59 months that slept under insecticide-treated net the previous night	.014	.260	-.003	.812	.004	.731	.015	.235
Children 0-59 months with suspected pneumonia within the previous 2 weeks, taken to the appropriate health care provider**	.041	.112	.005	.824	.009	.730	.062	.019
Children 0-59 months with diarrhoeawithin the previous 2 weeks,treated with ORT	-.039	.344	-.015	.675	.053	.216	-.029	.482
Assisted delivery by skilled health personnel	.046	.249	.007	.837	-.042	.314	.032	.420

Note **= interventions that were significantly associated with the nutritional status of the children.

4.11: Distribution of mother of U-5 children according to their knowledge of the components of child survival among the states

Experimental group:

Analysis of the 12 point knowledge statements revealed that for the experimental group, the percentage of respondents with poor and fair level of knowledge decreased from 46.6% and 22.5% at baseline to 0% and 4.4% respectively at post-intervention and the proportion of respondent with good and excellent knowledge increased from 26.2% and 4.7% at baseline to 26.8 and 68.8 at post-intervention respectively. There was a significant difference (P -value <0.05) in mothers level of knowledge among the states at both pre and post intervention. Ekiti State had the highest percentage of mothers with poor knowledge (55.0%) at baseline and the highest percentage with excellent knowledge at post-intervention (90.0%). In all the states the percentage of respondents with the poor and fair level of knowledge at baseline decreased at post-intervention, while the percentage of the respondent with an excellent level of knowledge at baseline increased at post-intervention.

Classifying respondents according to their place of residence showed that those from urban settlement significantly differ from those in the rural settlement in their level of knowledge at pre-intervention (p -value= 0.020) with the urban settlement having the highest percentage of respondents with poor level of knowledge and lowest percentage of respondents with an excellent level of knowledge. However, there was no significant difference (p -value= 0.092) between the urban and rural settlement at the post-intervention stage.

Control group

For the control group as shown in Fig. 4.8c, there was no significant difference in mothers' level of knowledge of factors influencing child survival among the states at both pre and post intervention. However, Fig 4.8d revealed a significant difference ($p<0.05$) between urban and rural settlements in mothers' level of knowledge at pre-intervention with the rural settlement having the highest proportion of respondents with a poor level of knowledge. There was no significant difference between the urban and rural settlements at the post-intervention stage.

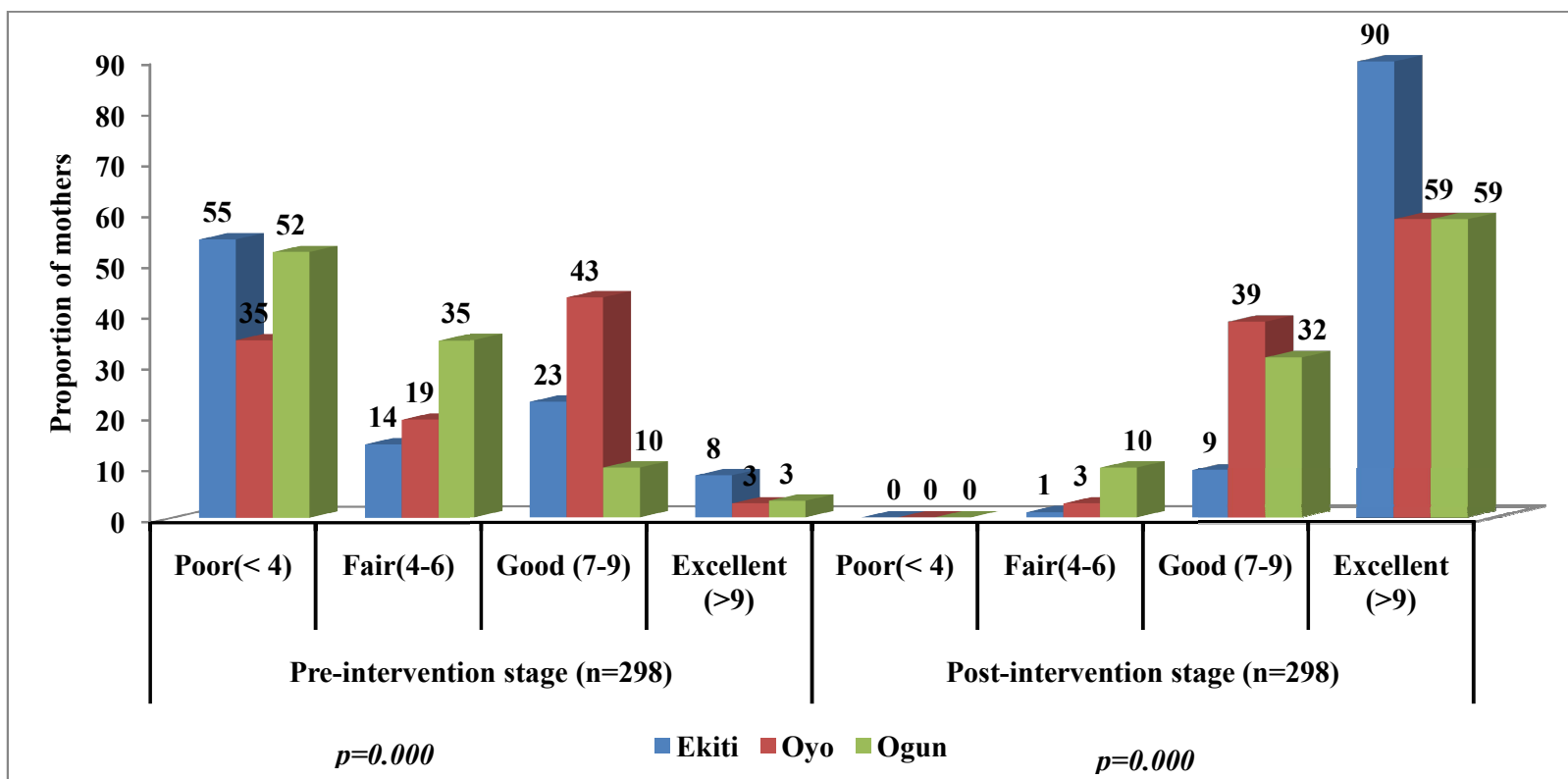


Figure 4.8a: Distribution of mothers of U-5 children according to their knowledge of factors influencing child survival among the states (experimental group).

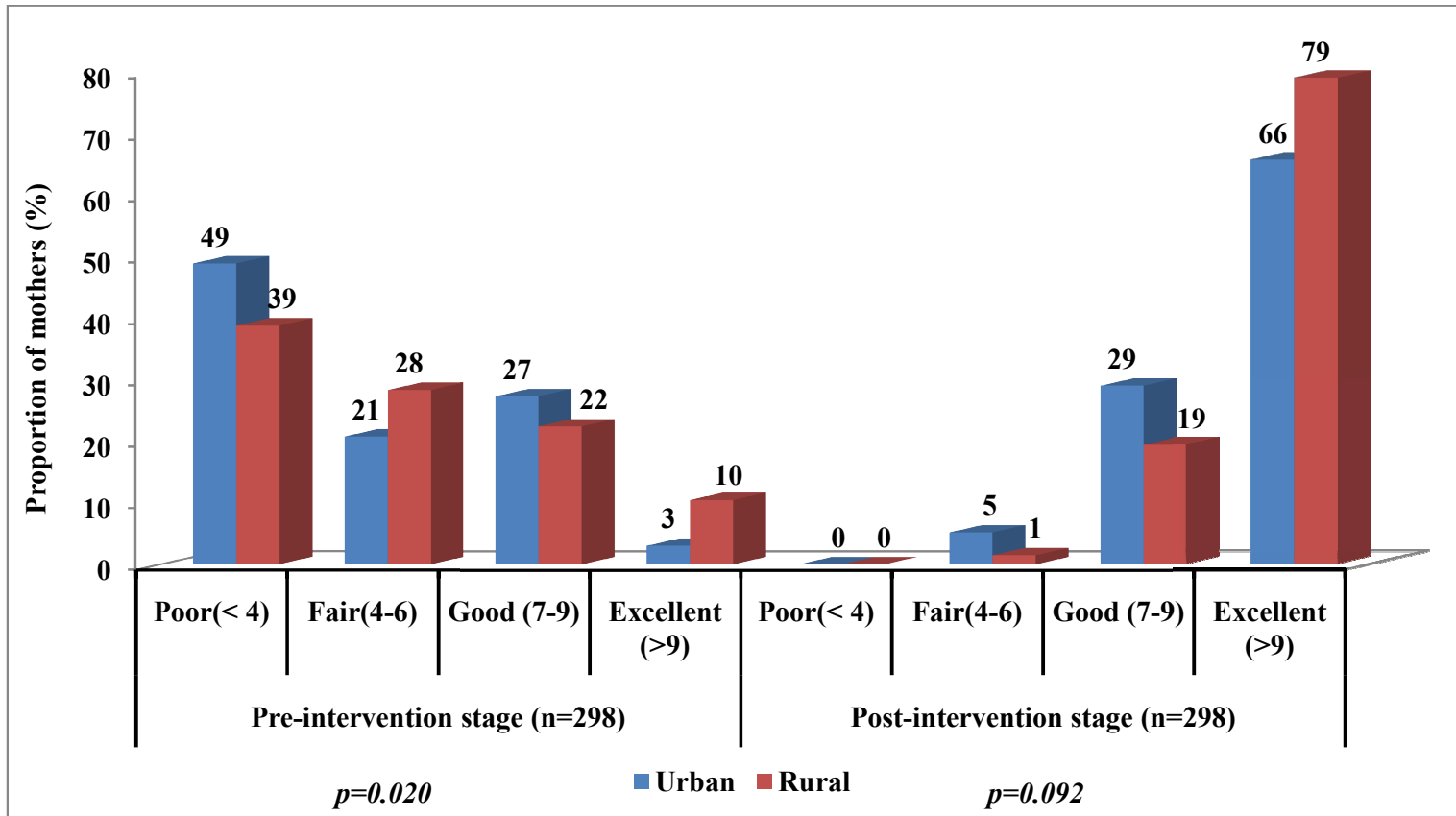


Figure 4.8b: Distribution of mothers of U-5 children according to their knowledge of factors influencing child survival among Urban-rural (experimental group).

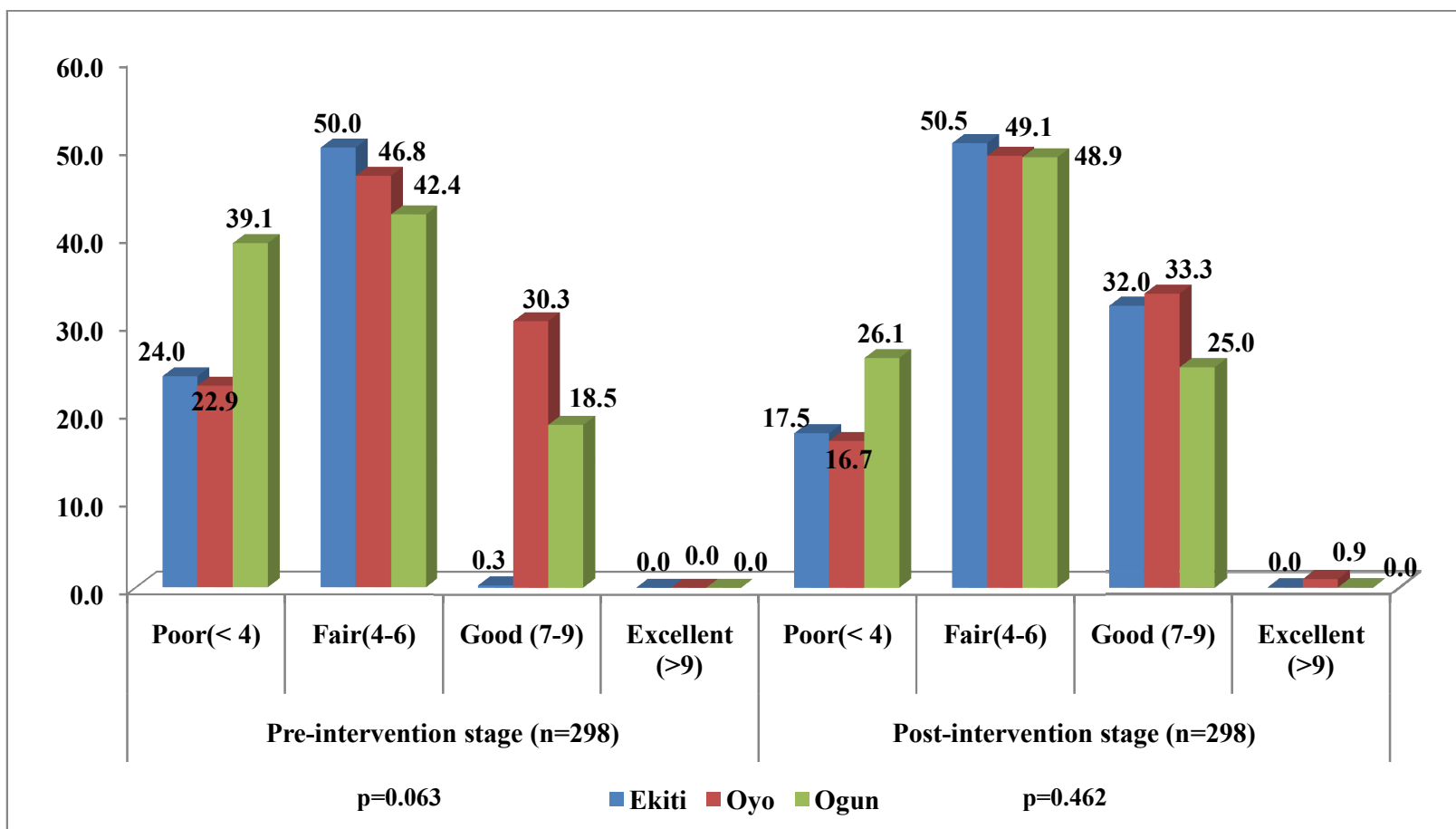


Figure 4.8c: Distribution of mothers of U-5 children according to their knowledge of factors influencing child survival among the states (control group)

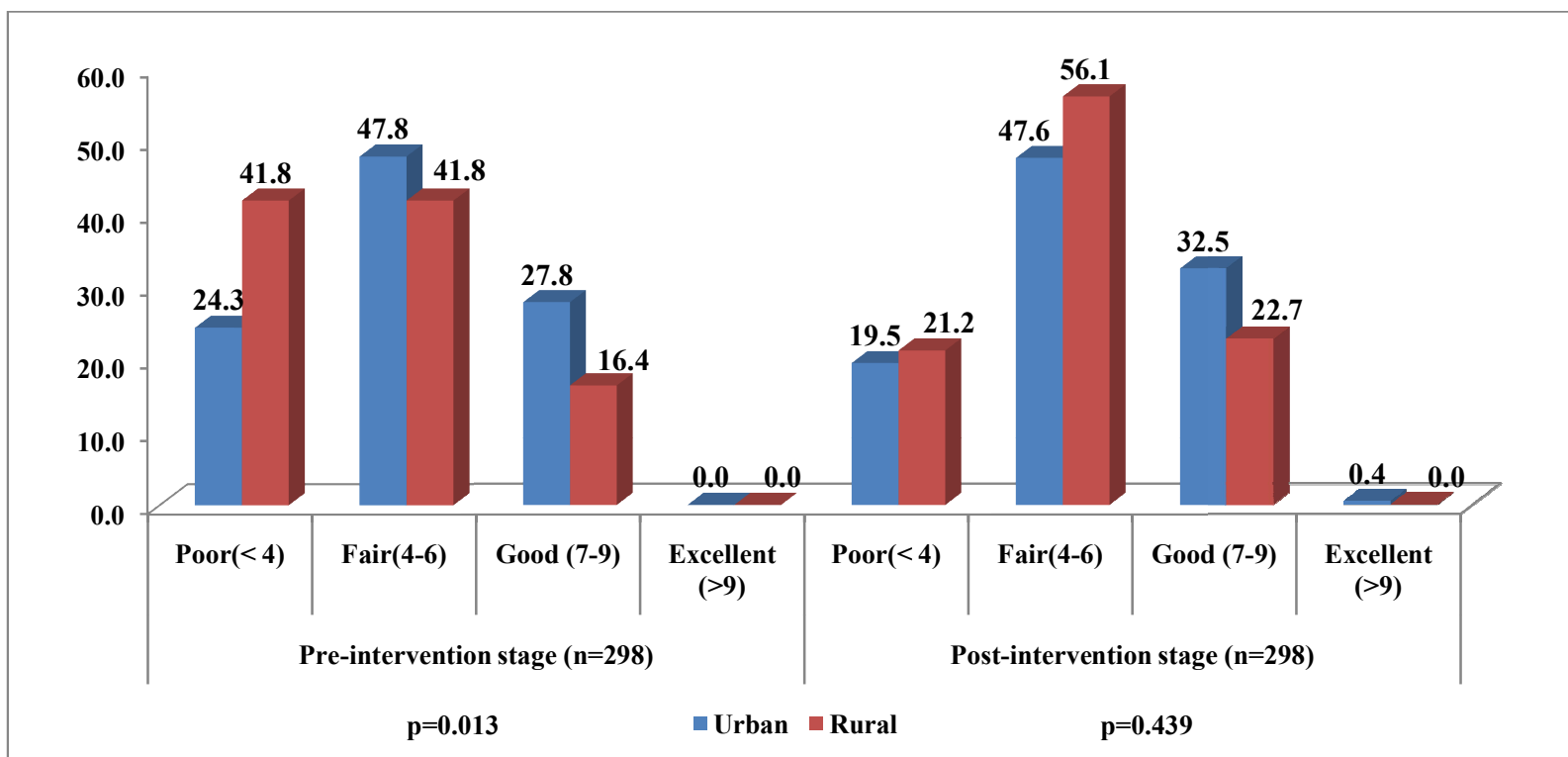


Figure 4.8d: Distribution of mothers of U-5 children according to their knowledge of factors influencing child survival among Urban-rural settlements (control group).

4.12: Comparison of mothers' level of knowledge of components of child survival between the control and experimental groups.

At baseline experimental group has the highest proportion of respondent having a poor and excellent level of knowledge (46.6%, 4.7% respectively) than the control group (28.2% and 0.0% respectively). At post-intervention, a large proportion (68.8%) of the respondents in the experimental group had an excellent level of knowledge of the components of child survival than those in the control group (0.3%). Among those in the control group, 19.8%, and 49.3% had a poor and fair level of knowledge at the end of the survey respectively. While fewer of those in the experimental group had 0.0% and 4.4% poor and fair level of knowledge at the end of the survey respectively.

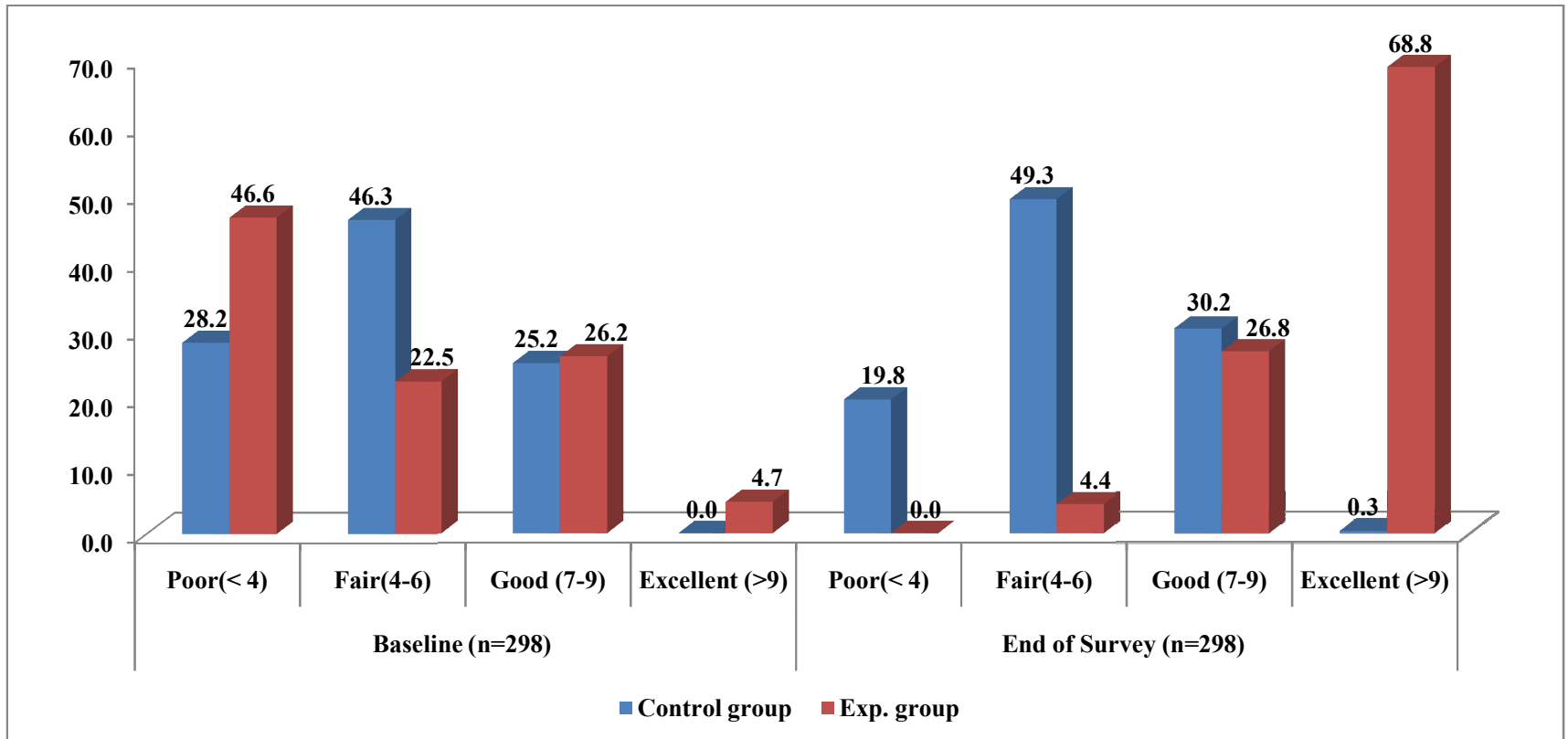
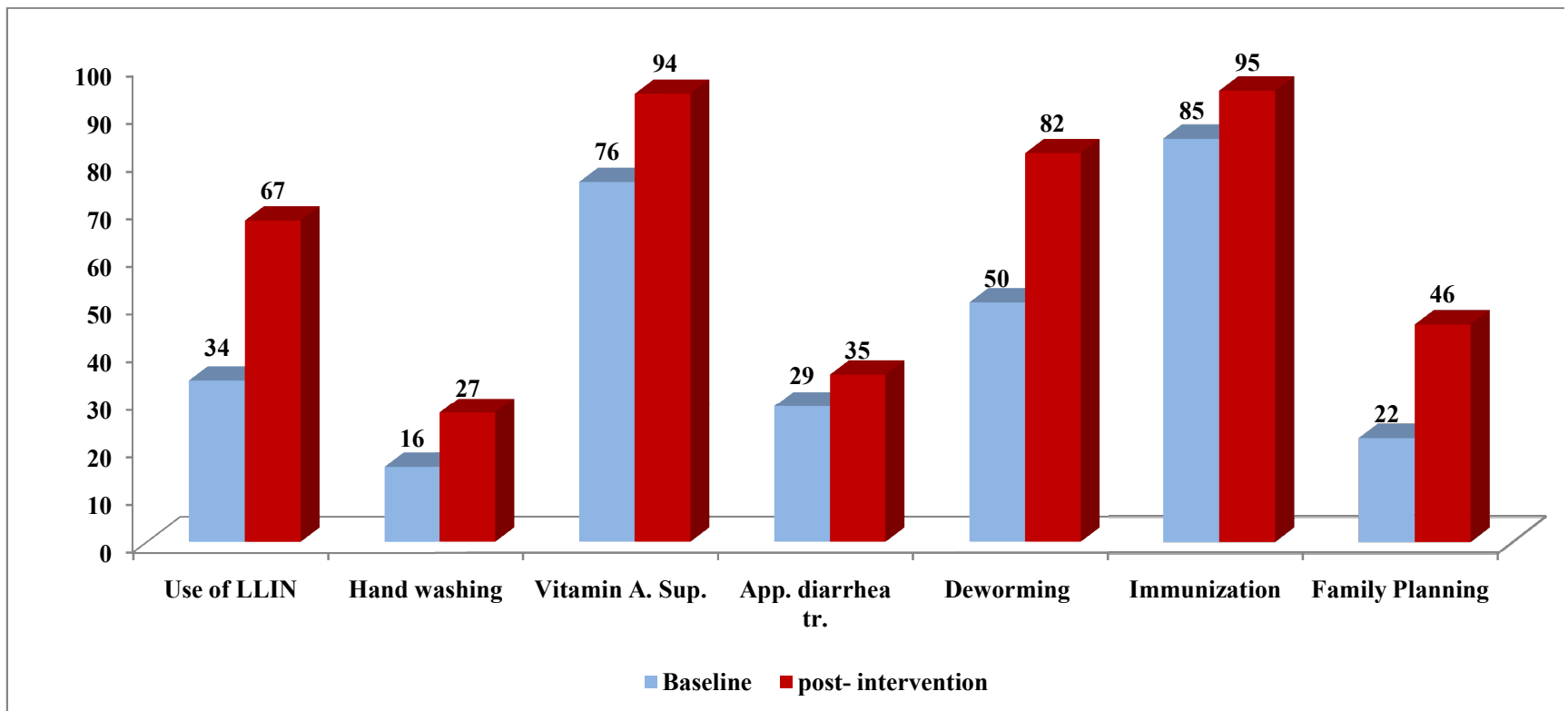


Figure 4.8e: Comparison of the level of knowledge of factors influencing child survival among mothers of U-5 children between the control and experimental groups

4.13: Practices that influenced child survival among mothers of U-5 children in the study (Experimental and control group).

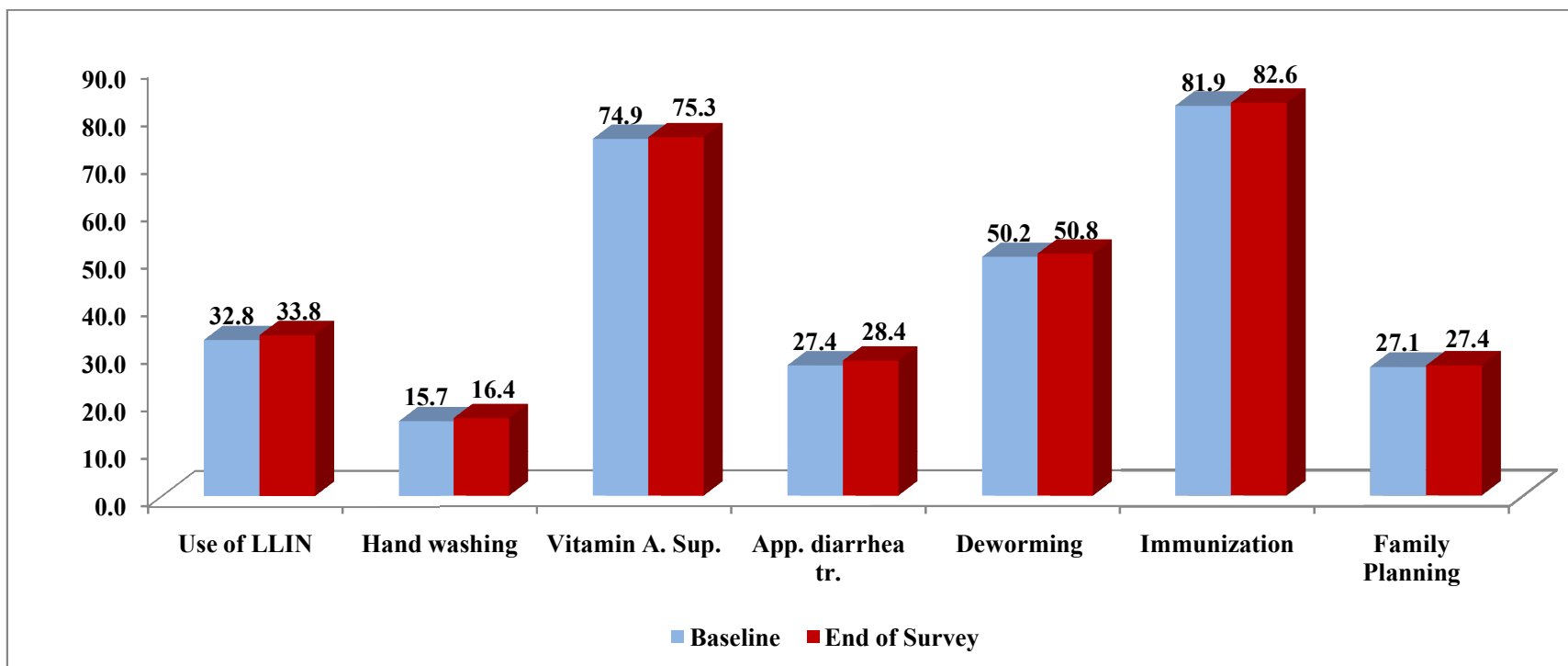
Table 4.8 revealed that for the experimental group, all the practices such as use of mosquito net, hand washing, vitamin A supplementation, appropriate diarrhoea treatment, deworming, immunisation and family planning among mothers increased from 34.0%, 15.8%, 75.8%, 28.6%, 50.5%, 84.8% and 21.6% at baseline to 67.7%, 27.3%, 94.3%, 35.4%, 81.8%, 94.9% and 45.6% at post-intervention respectively. The control group also improved from 32.8%, 15.7%, 74.9%, 27.4%, 50.2%, 81.9% and 27.1% to 33.8%, 16.4%, 75.3%, 28.4%, 50.8%, 82.6%, and 27.4% at the end of the survey respectively.

Even though there was an increase in respondents that were involved in practices that affect the survival of their children in both experimental and control group, the control group had just slight increase compared to the experimental group.



Note: LLIN=long lasting insecticide treated net. Sup=Supplementation; App. diarrhoea tr. =appropriate diarrhoea treatment

Figure 4.9a: Practices that influence child survival among mothers of U-5 children in the study (experimental group)



Note: LLIN=long lasting insecticide treated net. Sup=Supplementation; App. diarrhoea tr. =appropriate diarrhoea treatment;
Figure 4.9b: Preventive practices that influence child survival among mothers of U-5 children in the study (control group)

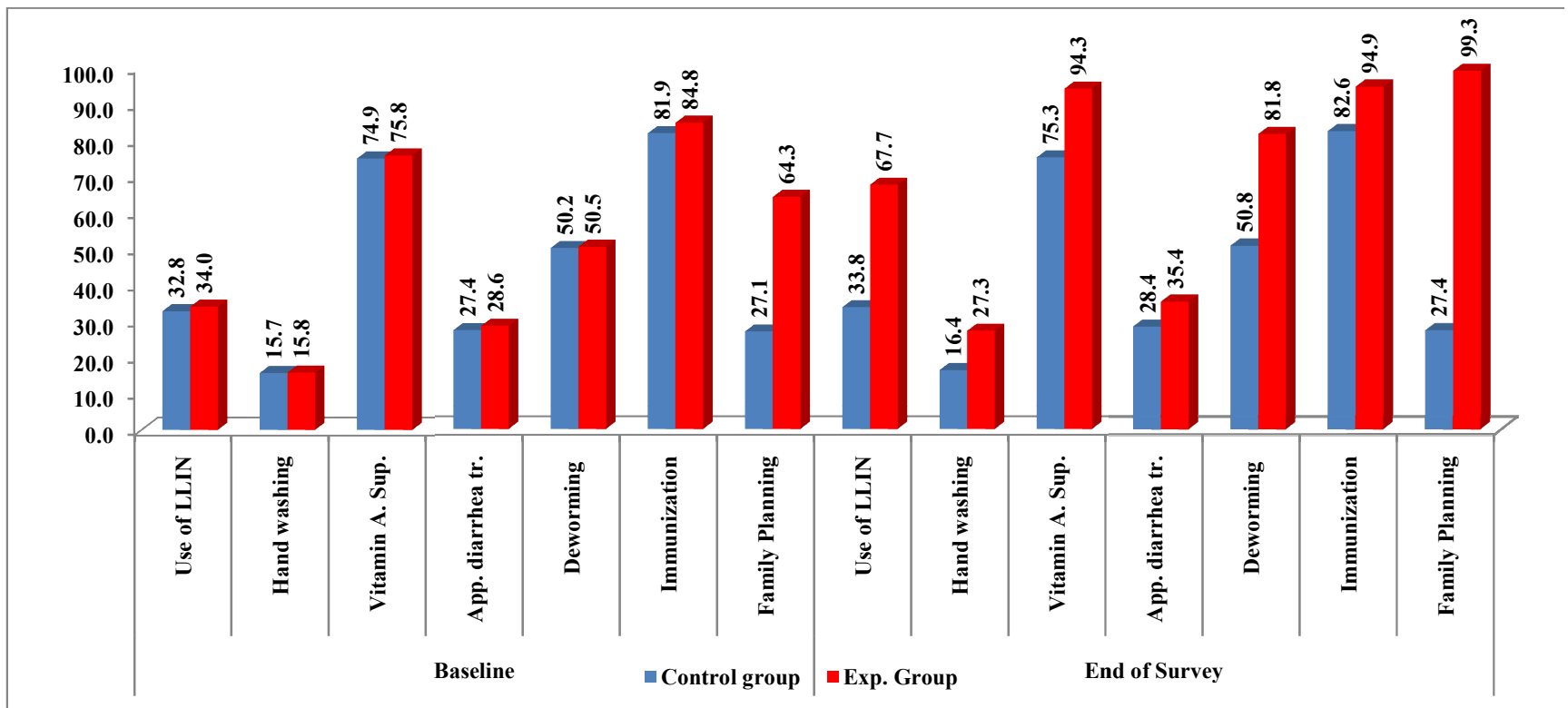


Figure 4.9c: Comparison of Preventive practices that influence child survival among mothers of U-5 children between control and experimental group.

4.14: Impact of BCC on the knowledge of mothers

A paired sample t-test was conducted to evaluate the impact of BCC on the knowledge and practices influencing child survival among mothers of under-five children in the study.

Level of knowledge

For experimental group: There was a significant increase in knowledge of mothers of under-five children in the study on the components of child survival from baseline (Mean = 4.51±3.03) to post-intervention (Mean=10.15±1.75), $t(297) = 28.99$, $p < 0.005$ (two-tailed); following the BCC provided to them there was an improvement of 5.64±3.36 at 95% CI (5.26 to 6.03).

The magnitude of the mean difference (effect size) using Eta squared statistics $\frac{t^2}{t^2 + (N - 1)}$

$$\text{Effect size (Eta squared)} = \frac{-28.94^2}{-28.94^2 + (298 - 1)} = 0.74$$

The intervention had a large effect (0.74) on the knowledge of mothers.

Control group: For the control group there was also a significant increase in the knowledge of mothers of under-five children on the components of child survival from baseline (Mean = 4.9±2.11) to post-intervention (Mean=5.3±2.07), $t(297) = 7.99$, $p < 0.005$ (two-tailed). However, the improvement (0.4±0.90 at 95% CI (0.32 to 0.52)) was minimal compared to the experimental group (5.64±3.37).

Table 4.10: Impact of BCC on the level of knowledge of mothers

Impact of BCC on mothers level of knowledge		Descriptive Statistics				Paired Differences							
		Mean	N	SD	Std.	Mean	SD	Std.	95% CI		t	Df	Sig.
					Error Mean			Error Mean	Lower	Upper			
Experimental group	Level of knowledge (Baseline)	4.51	298	3.03	0.18								
	Level of knowledge (post-intervention)	10.15	298	1.75	0.10	5.64	3.36	0.19	5.26	6.03	28.99	297	0.000
Control group	Level of knowledge (Baseline)	4.88	298	2.11	0.12								
	Level of knowledge (post-intervention)	5.29	298	2.07	0.12	0.42	0.90	0.05	0.32	0.52	7.99	297	0.000

4.15: Impact of BCC on child survival practices of mothers

A paired sample t-test was conducted to evaluate the impact of BCC on practices of mothers affecting child survival in the study.

Impact of BCC on child survival practices

For the experimental group: There was a significant improvement in practices among mothers of under-five children in the study from baseline (Mean = 3.96±2.12) to post-intervention (Mean=12.90±2.43), $t(297) = 48.73$, $p < 0.005$ (two-tailed); following the BCC provided to them. There was an improvement of 8.94±3.16 at 95% CI (8.57 to 9.29). The pre and post child survival practices and the direction of the t -value showed a significant improvement in child survival practices of mothers following the behavioural change communication provided to them.

Calculating the magnitude of the mean difference (effect size) using Eta squared statistics revealed that the intervention had a large effect (0.89) on the mothers of the under-5 children

$$\text{Effect size (Eta squared)} = \frac{-48.73^2}{-48.73^2 + (298 - 1)} = 0.89$$

The intervention had a large effect on (0.89) the sampled mothers in the study

For control group: for the control group there was also a significant improvement in the practices of mothers of under-five children in the study on the components of child survival from baseline (Mean = 3.8±2.1) to post-intervention (Mean=3.9±2.1), $t(297) = 3.2$, $p < 0.005$ (two-tailed). However the improvement in the practices of mothers (0.1±0.4 at 95% CI (0.03 to 0.11) was minimal compared to the experimental group (8.9±3.2).

Table 4:11: Impact of BCC on practices of mothers

		Descriptive Statistics				Paired Differences							
		Mean	N	SD	Std. Error Mean	Mean	SD	Std. Error Mean	Lower	Upper	T	Df	Sig.
Experimental group	practices (Baseline)	3.96	298	2.12	0.12	8.93	3.16	0.18	8.57	9.29	48.73	297	.000
	practices (post-intervention)	12.90	298	2.43	0.14								
Control group	practices (Baseline)	3.81	298	2.13	.124	0.07	0.36	0.02	0.03	0.11	3.21	297	.001
	practices (post-intervention)	3.88	298	2.13	.124								

4.16: Dietary pattern of the children analysed using factor analysis of food frequency questionnaires (FFQ) (n=1308).

Table 4:12 presented the results of the factor analysis of the individual food frequency result. A series of 10 scales were produced from factors with Eigenvalues >1 (for the 111 different foods). The items that loaded into each of the factors were remarkably consistent with food groups consumed by the children in the three states, this included cereals, root, and tuber, legumes, snacks, meat, fish and fish product, milk and dairy, fat and oil, fruits, vegetables, and beverages. A higher score indicates that the individual ate foods more frequently from that group than a person with a lower score. Items in the same scale were highly inter-correlated. Persons who ate a lot of one type of cereal food, rice, for example, were more likely to eat a lot of another cereal food.

Food which did not fit into any of the scales were excluded from the analysis. Some of the scales ranked only fair with Cronbach's alpha (0.6), they were used in the analyses because these foods were largely consumed by the children studied. The remaining scales had acceptable Cronbach's alpha of 0.7 and above indicating a good level of consistency in responses from respondents. The high alpha (Cronbach's alpha > 0.7) showed that all items in the scales were measuring the same construct. There was a significant difference ($P < 0.05$) in the consumption pattern of rice, yam, cassava, akara, puffpuff, beef, egg, fish, milk, yoghurt, orange, banana, and ewedu among children in the states.

The most frequently consumed food by the under-5 children in the study were rice (75.2%), bread (71.6), and bournvita/milo (86.9%).

Table 4.12: Dietary pattern of the children analysed using factor analysis of food frequency questionnaires (FFQ) (n=1308)

Group Name	Foods in Scale	Mean	SD	Cronbac h's Alpha	% of Consumption		P value	
					Daily	Total		
Cereal	Rice cooked	2.0	1.3	0.70	689(52.7)	984 (75.2)	0.003	
	Bread	1.7	1.2		521 (39.8)	937(71.6)	0.177	
	Noodles	1.3	1.2		328 (25.1)	759(58.0)	0.169	
Root and tuber	Yam (boiled / roasted)	1.4	1.3	0.73	379 (29.0)	791(60.5)	0.001	
	yam (fried)	1.1	1.3		323 (24.7)	599 (45.8)	0.003	
	Yam/cassava flour (cooked)	0.7	1.1		379(29.0)	755 (57.8)	0.000	
Legumes	beans pottage	1.2	1.3	0.60	318(24.3)	661(50.5)	0.070	
	Akara	1.2	1.2		253(19.3)	771(58.9)	0.000	
Snacks	Biscuit	2.1	1.3	0.89	857 (65.5)	991 (75.8)	0.800	
	Puffpuff	1.0	1.3		271 (20.7)	522 (40.0)	0.000	
Meat and poultry	Beef (cow meat)	1.1	1.3	0.71	353(27.0)	592(45.3)	0.000	
	Egg (boiled)	1.7	1.3		0.6	544(41.6)	880 (67.3)	0.000
	Egg (fried)	1.1	1.3			357(27.3)	591 (45.2)	0.000
Fish and fish products	fish (boiled)	1.3	1.3	0.61	387(29.6)	701(53.6)	0.000	
	Fried, Fresh or dried	0.7	1.1		196 (15.0)	412 (31.5)	0.000	
Milk and dairy	milk (tinned / evaporated powdered)	2.5	3.3	0.60	734(56.1)	734(56.1)	0.000	
	Yoghurt	0.8	1.1		198(15.1)	495(37.8)	0.027	
Beverages and Fat and oil	Bournvita, choco, milo and so on	2.3	3.1	0.61	744(54.0)	1136 (86.9)	0.846	
	palm oil	1.6	1.4		622 (47.6)	721 (55.1)	0.081	
	Butter	0.9	1.3		297(22.7)	473(36.2)	0.180	
Fruits	Orange	1.3	1.2	0.91	313(23.9)	747(57.1)	0.001	
	Banana	1.0	1.3		292(22.3)	547(41.8)	0.000	
Vegetable	Ewedu	1.4	1.3	0.87	372(28.4)	785 (60.0)	0.000	

Note: Values for food with variance < 0.15 were excluded for simplicity and food with daily consumption of < 15% were excluded from the table

4.17: Calculated mean intake of energy, nutrients and saturated fat for children in the study, from their 24-hour dietary recall.

Table 4.13 showed the mean intake of energy, protein, carbohydrate, fiber, fat, saturated fat, vitamin A, vitamin C, folate, calcium, potassium, zinc, and iron for children in the study, calculated from their 24-hour dietary recall using TDA software for calculating nutrient intake. The mean intake of energy (Kcal) in the study was 63.1 ± 28.0 . The mean intake of protein (g), carbohydrate (g), fiber (g), fat intake (g), saturated fat intake (g), vitamin A, vitamin C, folate, calcium, potassium, zinc and iron were 74.7 ± 42.4 , 76.3 ± 33.6 , 101.8 ± 94.7 , 48.5 ± 39.7 , 28.5 ± 31.0 , 840 ± 861.9 , 147.8 ± 197.6 , 124.1 ± 83.3 , 34.4 ± 26.6 , 65.5 ± 50.6 , 37.7 ± 25.0 and 89.2 ± 46.4 respectively. There were significant differences ($p < 0.05$) in the intake of energy, protein, carbohydrate, fiber, fat, saturated fat, vitamin A, vitamin C, calcium, zinc, and iron among children from the three states studied. Ogun State had the highest mean intake of energy, protein, carbohydrate, fiber, fat, saturated fat, vitamin A, calcium, and iron. Ekiti State had the highest mean intake of vitamin C and zinc.

Classifying the children according to the place of their residence revealed that apart from saturated fat and vitamin A, there was no significant difference ($p < 0.05$) in the mean intake of energy and other nutrients of the children. Children from Urban settlement had the highest intake of saturated fat and vitamin A compared to children from rural settlement.

Table 4.13: Calculated mean intake of energy, nutrients and saturated fat for children in the study, from their 24-hour dietary recall

Groups	Categories	Calorie s (Kcal)	Protei n (g)	Carbo hydrat es (g)	Dietary -Fiber (g)	Fat- Total (g)	Satura ted Fat (g)	Vitam inA (RE)	Vita min C	Folat e	Calciu m (mg)	Potas sium (mg)	Zinc (mg)	Iron	
State	Ekiti	Mean	64.7	71.1	80.5	104.0	42.8	28.9	94.3	159.5	136.1	35.1	71.6	41.2	86.8
		SD	25.1	40.2	31.4	84.9	35.7	28.6	116.9	213.5	83.6	27.5	48.8	33.4	42.3
	Oyo	Mean	53.9	68.0	64.4	90.6	41.9	24.7	125.6	104.3	120.0	29.2	64.9	34.0	83.4
		SD	29.4	41.0	34.4	82.2	37.2	29.2	120.5	154.5	85.0	20.9	50.3	16.0	45.6
	Ogun	Mean	72.2	85.4	86.4	112.7	60.5	32.6	193.7	188.0	118.9	39.9	61.2	38.9	97.3
		SD	25.3	43.9	30.3	113.0	42.9	34.4	169.3	218.1	80.6	30.3	51.9	24.4	49.3
	P<0.05	0.000	0.000	0.000	0.047	0.000	0.027	0.000	0.000	0.087	0.000	0.134	0.012	0.005	
Place of residen ce	Urban	Mean	63.8	76.2	76.2	101.3	50.0	29.8	145.9	147.1	125.2	34.7	65.5	38.3	89.2
		SD	28.7	42.4	34.2	96.2	40.5	32.4	147.3	200.8	83.8	25.8	51.7	24.8	45.8
	Rural	Mean	60.4	69.2	76.4	103.6	42.5	23.6	117.4	150.8	119.8	33.3	65.3	35.1	88.3
		SD	25.1	42.3	31.8	89.2	36.2	24.4	126.8	185.7	81.9	29.4	45.7	25.6	48.5
	P<0.05	0.224	0.101	0.971	0.81	0.058	0.043	0.048	0.851	0.519	0.59	0.958	0.196	0.834	
Total	Mean	63.1	74.7	76.3	101.8	48.5	28.5	140.0	147.8	124.1	34.4	65.5	37.7	89.2	
	N	609	609	609	609	609	609	609	609	609	609	609	609	609	
	SD	28.0	42.4	33.6	94.7	39.7	31.0	143.7	197.6	83.3	26.6	50.6	25.0	46.4	

4.18: Calculated mean intake of energy, nutrients and saturated fat for children (24-hour dietary recall) in the intervention group at baseline and post-intervention.

This table showed the mean intake of energy, protein, carbohydrate, fiber, fat, saturated fat, vitamin A, calcium, zinc, and iron of children in the experimental group, calculated from their 24-hour dietary recall using TDA software for calculating nutrient intake. At baseline, the mean intake of energy (Kcal) of the children in the experimental group was 61.8 ± 26.3 . The mean intake of nutrients of the children in the experimental group were protein (g) (72.8 ± 40.3), carbohydrate (g) (74.5 ± 31.8), fat intake (g) (45.3 ± 33.6), saturated fat (g) (27.5 ± 23.8), vitamin A (RE) (118.8 ± 158.5), calcium (mg) (32.2 ± 23.3), zinc (mg) (39.7 ± 29.6) and iron (89.7 ± 50.6).

There was a significant difference ($p < 0.05$) in the intake of energy, protein, carbohydrate, total fat, saturated fat, vitamin A, and calcium among children from the three states studied. Children from Ogun State had the highest mean intake of energy (77.1 ± 23.3), nutrients and saturated fat (36.1 ± 24.6). While Ekiti State had the lowest mean intake of protein (65.9 ± 39.4), vitamin A (85.3 ± 127.6) and calcium (28.1 ± 18.0). Oyo State had the lowest intake of energy (54.8 ± 23.3), carbohydrates (66.3 ± 29.9), and saturated fat (22.3 ± 18.1). There was no significant difference in the mean intake of zinc and iron of children among the states studied.

Classifying the children according to their place of residence showed that apart from vitamin A, calcium, and iron there was no significant difference in the intake of energy, other nutrients and saturated fat between the urban-rural settlements at baseline. Children from Urban settlement had the highest intake of vitamin A (123.1 ± 167.3), calcium (34.3 ± 24.7) and iron (94.7 ± 52.5) at baseline in the experimental group.

At post-intervention, the mean intake of energy (Kcal) of children in the experimental group was 73.2 ± 28.5 . Mean intake of nutrients of children in the experimental group were protein (g) (85.6 ± 41.5), carbohydrate (g) (86.5 ± 34.6), total fat (55.3 ± 34.3)(g), saturated fat (g) (30.8 ± 28.5), vitamin A (RE) (197.0 ± 232.2), calcium (mg) (36.9 ± 24.8), zinc (mg) (55.7 ± 47.2) and iron (111.6 ± 72.0). Apart from vitamin A (RE), there was no significant difference in the mean intake of energy, nutrients and saturated fat of children among the

states. Ogun and Ekiti State had the highest (190.1 ± 230.9) and lowest (85.3 ± 127.6) intake of vitamin A respectively.

Classifying the children according to the place of their residence revealed a significant difference ($p<0.05$) in the intake of energy, protein, carbohydrate, total fat, calcium and iron between urban-rural settlements in the experimental group. Children from Urban settlement had the highest intake of energy (76.0 ± 27.3), protein (88.4 ± 40.9), carbohydrate (89.3 ± 33.4), total fat (58.6 ± 34.0), calcium (38.8 ± 25.6), and iron (116.9 ± 74.7) in the experimental group. There was no significant difference in the intake of vitamin A and saturated fat of children in the urban-rural settlements.

Comparison between baseline and post-intervention showed that the mean intake of energy, protein (g), carbohydrate (g), total fat (g), saturated fat (g), vitamin A (RE), calcium (mg), zinc (mg) and iron of the children increased from 61.8 ± 26.3 , 72.8 ± 40.3 , 74.5 ± 31.8 , 45.3 ± 33.6 , 118.8 ± 158.5 , 32.2 ± 23.3 , 39.7 ± 29.6 , and 89.7 ± 50.6 at baseline to 73.2 ± 28.5 , 85.6 ± 41.5 , 86.5 ± 34.6 , 55.3 ± 34.3 , 197.0 ± 232.2 , 36.9 ± 24.8 , 55.7 ± 47.2 , and 111.6 ± 72.0 at post-intervention respectively. Saturated fat intake of the children also increased from 27.5 ± 23.8 at baseline to 30.8 ± 28.5 at post-intervention.

Table 4.14: Calculated mean intake of energy, nutrients and saturated fat for under-5 children (24-hour dietary recall) in the experimental group at baseline (pre-intervention) and post-intervention.

Groups	Categories		Energy		Protein		Carbohydrates		Fat-Total		Saturated Fat		Vitamin A (RE)		Calcium		Zinc		Iron	
			Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
State	Ekiti	Mean	62.4	72.5	65.9	79.4	76.7	85.8	40.0	48.7	29.6	33.1	85.3	142.9	28.1	35.0	39.0	56.4	81.4	106.3
		S.D	28.4	33.1	39.4	43.8	33.6	38.9	35.1	32.9	28.5	31.1	127.6	199.3	18.0	19.7	40.2	54.5	49.7	81.8
	Oyo	Mean	54.8	70.8	70.9	87.9	66.3	82.3	42.7	56.1	22.3	28.5	112.5	215.8	29.9	36.3	36.8	59.1	88.2	119.3
		S.D	23.3	27.5	42.1	43.0	29.9	33.4	33.9	37.2	18.1	28.2	132.3	214.7	21.5	26.2	18.2	49.5	48.0	74.4
	Ogun	Mean	77.1	79.1	88.9	89.7	90.3	95.8	60.2	63.4	36.1	32.3	190.1	237.2	44.5	40.9	47.7	48.0	107.3	103.4
		S.D	23.3	22.8	34.4	34.5	27.1	28.9	26.8	28.8	24.6	25.4	230.9	291.7	31.0	28.3	30.3	27.1	55.8	48.0
		P<0.05	0.00	0.36	0.07	0.42	0.01	0.16	0.04	0.14	0.04	0.63	0.03	0.03	0.01	0.53	0.30	0.52	0.12	0.454
Place of residence	Urban	Mean	63.2	76.0	75.9	88.4	75.4	89.3	48.3	58.6	28.7	32.4	123.1	210.6	34.3	38.8	41.8	58.7	94.7	116.9
		S.D	25.0	27.3	41.2	40.9	30.7	33.4	34.1	34.0	22.3	28.2	167.3	232.1	24.7	25.6	31.4	48.7	52.5	74.7
	Rural	Mean	55.5	58.6	59.0	71.0	70.6	71.7	31.7	38.4	21.9	22.8	99.3	126.4	22.7	27.2	30.1	40.1	67.6	84.1
		S.D	31.0	31.0	33.7	42.4	36.8	37.6	28.2	31.4	29.3	28.9	111.3	217.2	12.2	17.1	16.7	35.4	33.6	48.4
		P<0.05	0.21	0.00	0.07	0.05	0.51	0.02	0.32	0.01	0.22	0.12	0.47	0.52	0.03	0.03	0.86	0.65	0.02	0.03
Total		Mean	61.8	73.2	72.8	85.6	74.5	86.5	45.3	55.3	27.5	30.8	118.8	197.0	32.2	36.9	39.7	55.7	89.7	111.6
		S.D	26.3	28.5	40.3	41.5	31.8	34.6	33.6	34.3	23.8	28.5	158.5	232.2	23.3	24.8	29.6	47.2	50.6	72.0

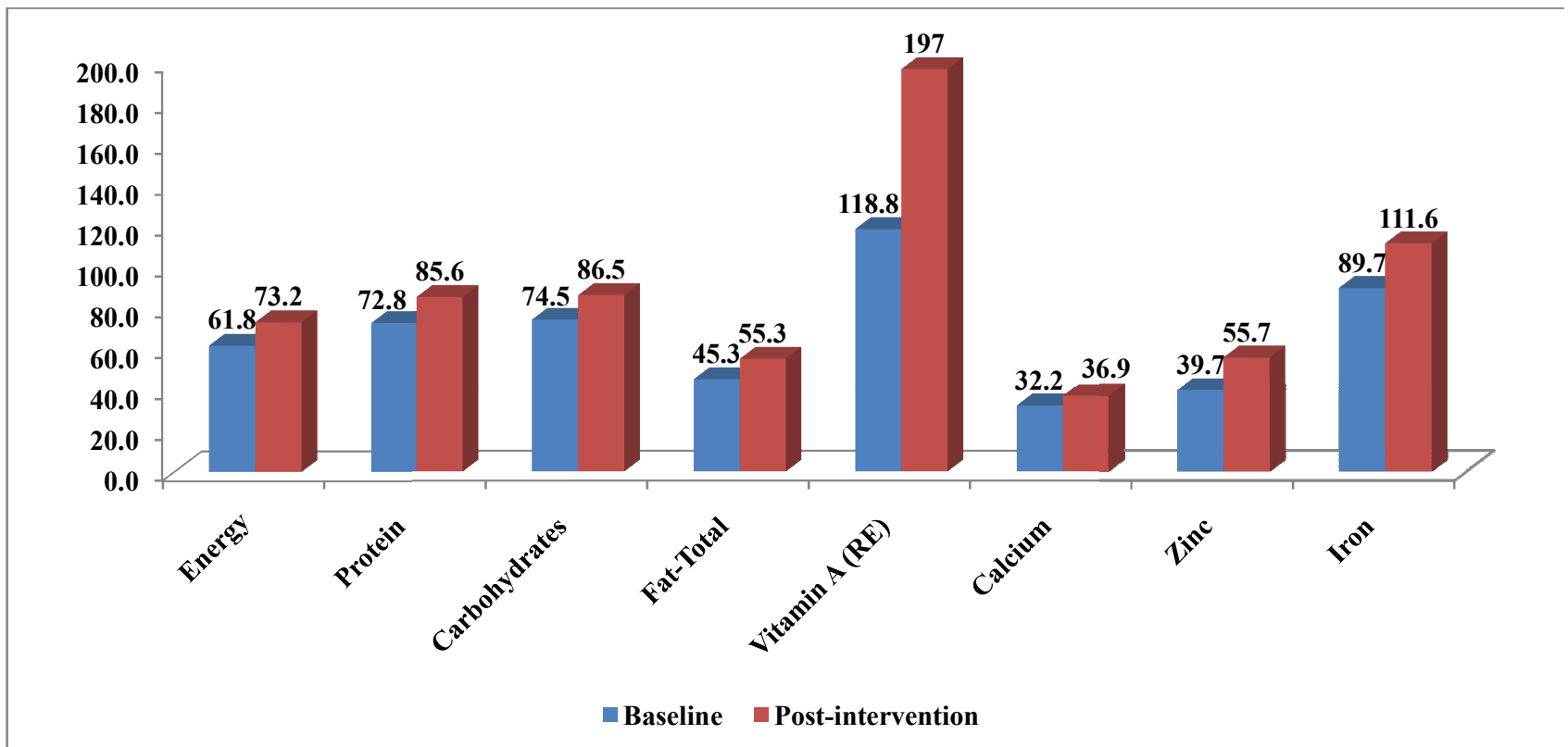


Figure 4.10: Comparison of calculated mean intake of energy and nutrients of the under-5 children (24-hour dietary recall) in the experimental group between baseline and post-intervention.

4.19: Adequacy of intake of energy and nutrients of children in the study (adequacy was estimated from their 24-hour dietary recall).

Mean daily dietary intake and consumption were estimated from the nutrient intake of the children. This was categorised as inadequate (<80%), adequate (80-120%) and excess (>120%). From Table 4.15, it was observed that less than half of all the children had adequate intake of energy (20.7%), protein (23.5%), carbohydrate (31.5%), fiber (19.4%), fat (8.0%), vitamin A (9.4%), vitamin C (13.4%), folate (20.9%), calcium (4.8%), potassium (17.1%), zinc (2.0%) and iron (33.5%) in the study. There was a significant difference ($p < 0.05$) in the percentage of children with adequate intake of energy, protein, carbohydrate, fiber, fat, vitamin A, and vitamin C, of children among the states, studied. Ogun State had the highest percentage of children with adequate intake of energy (30.1%), carbohydrates (43.7%), and total fat (11.7%). Ekiti State had the highest percentage of children with adequate intake of protein (25.0%), fiber (25.6%) and vitamin C (15.5%). Oyo State had the highest percentage of children with adequate intake of vitamin A (9.9%).

Classifying the children according to the place of their residence revealed that there was no significant difference in the adequate intake of energy and nutrients of children between urban-rural settlements.

Table 4.15: Dietary intake of energy and nutrients of children in the study (adequacy was estimated from their 24-hour dietary recall).

Groups	Categories	Energy	Protein	CHO	Dietary Fiber	Fat total	Vitamin A	Calcium	Zinc	Iron	
State	Inadequate	129(76.8)	114(67.9)	91 (54.2)	78(46.4)	153(91.1)	101(60.1)	159(94.6)	159(94.6)	84(50.0)	
	Adequate	34 (20.2)	42 (25.0)	59 (35.1)	43(25.6)	6 (3.6)	15 (8.9)	7 (4.2)	3(1.8)	58(34.5)	
	Ekiti	Excess	5 (3.0)	12 (7.1)	18 (10.7)	47(28.0)	9 (5.4)	52 (31.0)	2 (1.2)	6(3.6)	26(15.5)
		Inadequate	198(85.0)	162 (69.5)	178(76.4)	141(60.5)	205 (88.0)	99(9.2)	224(96.1)	229(98.3)	127(54.5)
		Adequate	30 (12.9)	51 (21.5)	43 (18.5)	32(13.7)	19 (8.2)	23 (9.9)	9 (3.9)	4(1.7)	73(31.3)
	Oyo	Excess	5 (2.1)	21 (9.0)	12 (5.2)	60(25.8)	9 (3.9)	111(47.6)	0 (0.0)	0(0.0)	33(14.2)
		Inadequate	134(65.0)	116 (56.3)	89 (43.2)	111(53.9)	158(76.7)	66(32.0)	189(94.2)	197(95.6)	88(42.7)
		Adequate	62(30.1)	50 (24.3)	90 (43.7)	43(20.9)	24(11.7)	19(9.2)	13(6.3)	5(2.4)	72(35.0)
	Ogun	Excess	10 (4.9)	40 (19.4)	27 (13.1)	52(25.2)	24(11.7)	121(58.7)	4 (1.9)	4(1.9)	46(22.3)
		P<0.005	0.000	0.001	0.000	0.024	0.000	0.000	0.196	0.085	0.082
Place of residence	Inadequate	357(74.1)	304 (63.1)	290(60.2)	267(55.4)	407(84.4)	205(45.5)	453(94.0)	464(96.3)	231(47.9)	
	Urban	Adequate	109(22.6)	119 (24.7)	148(30.7)	89(18.5)	42(8.7)	42(8.7)	25(5.2)	10(2.1)	168(34.9)
		Excess	16(3.3)	59 (12.2)	44 (9.1)	126(26.1)	33 (6.8)	235(48.8)	4 (0.8)	8(1.7)	84(17.2)
	Rural	Inadequate	104(83.2)	88 (70.4)	68 (54.4)	63 (50.4)	109 (87.2)	61(48.8)	119(95.2)	121(96.8)	68(54.4)
		Adequate	17(13.6)	23 (18.4)	44 (35.2)	29(23.2)	7 (5.6)	15(12.0)	4 (3.2)	2(1.6)	35(28.0)
		Excess	4(3.2)	14 (11.2)	13 (10.4)	33(26.4)	9 (7.2)	49 (39.2)	2 (1.6)	2(1.6)	22(17.6)
		P<0.005	0.083	0.273	0.506	0.449	0.522	0.137	0.489	0.943	0.325
Total	Inadequate	463(76.0)	393 (64.5)	360(59.1)	332(54.5)	518(85.1)	266(43.8)	572(94.2)	585(96.4)	299(49.1)	
	Adequate	126(20.7)	143 (23.5)	192(31.5)	118(19.4)	49 (8.0)	57(9.4)	29 (4.8)	12(2.0)	204(33.5)	
	Excess	20 (3.3)	73 (12.0)	57 (9.4)	159(26.1)	42 (6.9)	284(46.8)	6 (1.0)	10(1.6)	106(17.4)	

Note: CHO = Carbohydrate

4.20: Dietary intake of energy and nutrients of children in the intervention group at baseline and post-intervention (adequacy was estimated from their 24-hour dietary recall).

Baseline: table 4.16a revealed thecalculated energy and nutrients intake of children in the experimental group at baseline from their 24-hour recall. It revealed that 24.6%, 10.3%, 33.3%, 6.3%, 5.6%, 6.3%, 4.0% and 35.7% of the children had an adequate intake of energy, protein, carbohydrate, total fat, vitamin A, calcium, zinc,and iron respectively. There was a significant difference in the intake of energy and carbohydrates among the states. Ogun State had the highest proportion of children with adequate intake of energy (48.0%) and carbohydrate (52.0%) while Oyo State had the lowest proportion of children with adequate intake of energy (15.3%) and carbohydrates (20.3%) among the states. There was no significant difference in the proportion of children with adequate intake of other nutrients measured among the experimental group at baseline.

Classifying the children according to the place of their residence revealed that there was no significant difference between urban and rural settlements in the proportion of children with adequate intake of energy and nutrients in the experimental group at baseline.

Post-intervention: Table 4.16b showed the calculated energy and nutrient intake of children in the experimental group at post-intervention. It revealed that 41.6%, 32.9%, 36.6%, 21.1%, 6.2%, 6.9%, 3.7%,and 37.9% had an adequate intake of energy, protein, carbohydrate, total fat, vitamin A, calcium, zinc,and iron respectively. There was a significant difference ($P<0.05$) in the children's intake of vitamin A and iron among the states. Oyo and Ogun State had the highest proportion of children with adequate intake of vitamin A (8.2%) and iron respectively (58.3%). There was no significant difference in the proportion of children with adequate intake of other nutrients measured among the experimental group at post-intervention.

Classifying the children according to the place of their residence revealed that there was a significant difference in children's intake of energy and vitamin A between the urban-rural settlements. Urban and rural settlements had the highest proportion of children with adequate intake of energy (45.9%) and vitamin A (15.4%) respectively. There was no significant difference in the proportion of children with adequate intake of other nutrients measured in children from the experimental group at post-intervention in the urban and rural settlements.

Comparison between baseline and post-intervention (Fig. 4.11):

Comparing the adequacy of energy and nutrient intake of the children at baseline and post-intervention stage revealed that adequate intake of energy, protein (g), carbohydrate (g), total fat (g), saturated fat (g), vitamin A (RE), calcium (mg), and iron of the children increased from 24.6%, 10.3%, 33.3%, 6.3%, 5.6%, 15.9%, 6.3% and 35.7% at baseline to 41.6%, 32.9%, 36.6%, 21.1%, 6.2%, 21.1%, 6.9% and 37.9% at post-intervention respectively. The intake of zinc was almost the same at baseline (4.0%) and post-intervention (3.7%) respectively.

Table 4.16a: Dietary energy and nutrients intake of children in the intervention group at baseline

Groups	Categories	Calories	Protein	CHO	Fat total	Vitamin			
						A	Calcium	Zinc	Iron
States	Inadequate	31(73.8)	31(73.8)	23(54.8)	39(92.9)	29(69.0)	41(97.6)	39(92.9)	22(52.4)
	Adequate	10 (23.8)	8(19.0)	17(40.5)	1(2.4)	1(2.4)	1(2.4)	1(2.4)	16(38.1)
Ekiti	Excess	1 (2.4)	3(7.1)	2(4.8)	2(4.8)	12(28.6)	0(0.0)	2(4.8)	4(9.5)
	Inadequate	49(83.1)	38(64.4)	44(74.6)	51(86.4)	29(49.2)	55(93.2)	57(96.6)	31(52.5)
Oyo	Adequate	9 (15.3)	15(25.4)	12(20.3)	5(8.5)	5(8.5)	4(6.8)	2(3.4)	16(27.1)
	Excess	1 (1.7)	6(10.2)	3(5.1)	3(5.1)	25(42.4)	0(0.0)	0(0.0)	12(20.3)
Ogun	Inadequate	13(52.0)	12(48.0)	9(36.0)	22(88.0)	11(44.0)	21(84.0)	22(88.0)	8(32.0)
	Adequate	12(48.0)	9(36.0)	13(52.0)	2(8.0)	1(4.0)	3(12.0)	2(8.0)	13(52.0)
Residence	Excess	0 (0.0)	4(16.0)	3(12.0)	1(4.0)	13(52.0)	1(4.0)	1(4.0)	4(16.0)
	P<0.005	0.032	0.332	0.014	0.786	0.160	0.339	0.384	0.153
Urban	Inadequate	73(70.9)	63(61.2)	61(59.2)	90(87.4)	58(56.3)	94(91.3)	96(93.2)	45(43.7)
	Adequate	29(28.2)	29(28.2)	36(35.0)	8(7.8)	5(4.9)	8(7.8)	4(3.9)	40(38.8)
Rural	Excess	1(1.0)	11(10.7)	6(5.8)	5(4.9)	40(38.8)	1(1.0)	3(2.9)	18(17.5)
	Inadequate	20(87.0)	18(78.3)	15(65.2)	22(95.7)	11(47.8)	23(100.0)	22(95.7)	16(69.6)
Total	Adequate	2(8.7)	3(13.0)	6(26.1)	0(0.0)	2(8.7)	0(0.0)	1(4.3)	5(21.7)
	Excess	1(4.3)	2(8.7)	2(8.7)	1(4.3)	10(43.5)	0(0.0)	0(0.0)	2(8.7)
Total	P<0.005	0.086	0.270	0.671	0.379	0.654	0.339	0.707	0.080
	Inadequate	93(73.8)	81(64.3)	76(60.3)	112(88.9)	69(54.8)	117(92.9)	118(93.7)	61(48.4)
Total	Adequate	31(24.6)	32(10.3)	42(33.3)	8(6.3)	7(5.6)	8(6.3)	5(4.0)	45(35.7)
	Excess	2(1.6)	13(10.3)	8(6.3)	6(4.8)	50(39.7)	1(0.8)	3(2.4)	20(15.9)

*Adequacy was estimated from their 24 Hour Dietary Recall. (Note: CHO= Carbohydrate)

Table 4.16b: Dietary energy and nutrients intake of intervention group children at post-intervention

Groups	Categories	Energy	Protein	CHO	Fat total	Vitamin A	Calcium	Zinc	Iron
States	Inadequate	31(59.6)	28(53.8)	26(50.0)	13(25.0)	32(61.5)	50(98.0)	45(86.5)	22(42.3)
	Adequate	17(32.7)	16(30.8)	18(34.6)	11(21.2)	3(5.8)	1(2.0)	1(1.9)	16(30.8)
	Ekiti Excess	4(7.7)	8(15.4)	8(15.4)	28(53.8)	17(32.7)	0(0.0)	6(11.5)	14(26.9)
	Inadequate	40(54.8)	33(45.2)	38(52.1)	29(39.7)	20(27.4)	65(89.0)	62(84.9)	25(34.2)
	Adequate	30(41.1)	25(34.2)	24(32.9)	16(21.9)	6(8.2)	7(9.6)	2(2.7)	24(32.9)
	Oyo Excess	3(4.1)	15(20.5)	11(15.1)	28(38.4)	47(64.4)	1(1.4)	9(12.3)	24(32.9)
Ogun	Inadequate	15(41.7)	18(50.0)	11(30.6)	12(33.3)	17(47.2)	32(88.9)	32(88.9)	10(27.8)
	Adequate	20(55.6)	12(33.3)	17(47.2)	7(19.4)	1(2.8)	3(8.3)	3(8.3)	21(58.3)
	Excess	1(2.8)	6(16.7)	8(22.2)	17(47.2)	18(50.0)	1(2.8)	1(2.8)	5(13.9)
Residence	P<0.005	0.263	0.897	0.303	0.451	0.004	0.365	0.272	0.045
	Inadequate	66(48.9)	64(47.4)	59(43.7)	47(34.8)	55(40.7)	121(90.3)	114(84.4)	43(31.9)
	Urban Adequate	62(45.9)	45(33.3)	51(37.8)	29(21.5)	6(4.4)	11(8.2)	6(4.4)	52(38.5)
	Urban Excess	7(5.2)	26(19.3)	25(18.5)	59(43.7)	74(54.8)	2(1.5)	15(11.1)	40(29.6)
	Rural Inadequate	20(76.9)	15(57.7)	16(61.5)	7(26.9)	14(53.8)	26(100.0)	25(96.2)	14(53.8)
	Rural Adequate	5(19.2)	8(30.8)	8(30.8)	5(19.2)	4(15.4)	0(0.0)	0(0.0)	9(34.6)
Total	Excess	1(3.8)	3(11.5)	2(7.7)	14(53.8)	8(30.8)	0(0.0)	1(3.8)	3(11.5)
	P<0.005	0.030	0.539	0.192	0.288	0.023	0.253	0.265	0.057
	Inadequate	86 (53.4)	79(49.1)	75(46.6)	54(33.5)	69(42.9)	147(91.9)	139(86.3)	57(35.4)
Total	Adequate	67(41.6)	53(32.9)	59(36.6)	34(21.1)	10(6.2)	11(6.9)	6(3.7)	61(37.9)
	Excess	8(5.0)	29(18.0)	27(16.8)	73(45.3)	82(50.9)	2(1.2)	16(9.9)	43(26.7)

*Adequacy was estimated from their 24 Hour Dietary Recall. (Note: CHO= Carbohydrate)

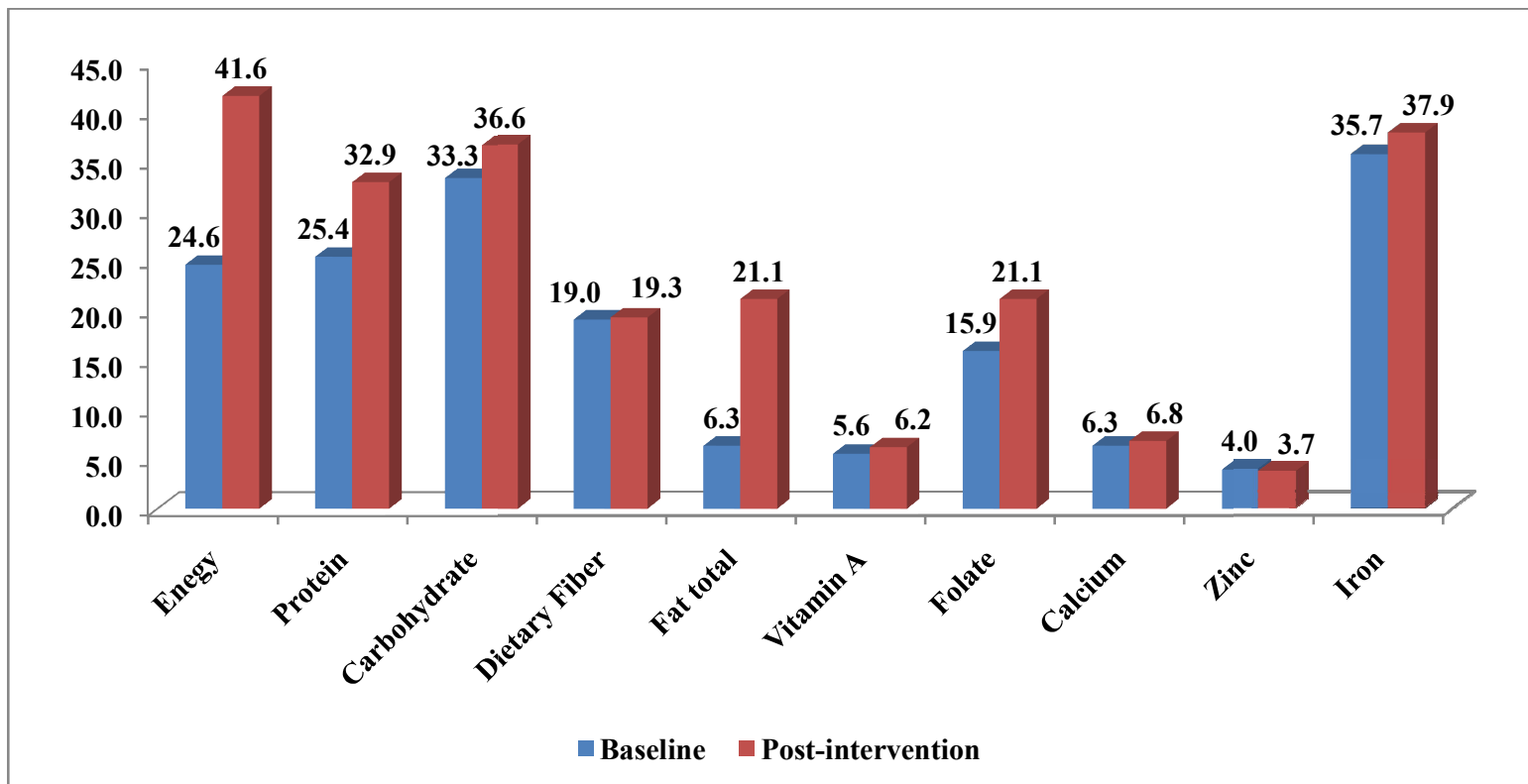


Figure4.11:Comparison of energy and nutrient intake adequacy between baseline and post-intervention of experimental group children

4:21 Focus group discussion

Twelve FGDs were conducted to explore perceived benefits and limitation to the uptake of interventions among mothers of under-5 children in each of the states. This was used to validate the instruments used in assessing the determinants of child survival in the study and also to adapt the contents of the BCC tools used in providing the interventions.

Child survival interventions available in the study areas as stated by the respondents

Respondents in the experimental communities listed the available child survival intervention in their communities as:

- Antenatal care
- Newborn care
- Immunisation
- Growth monitoring
- Management of childhood illnesses
- Use of LLIN
- Vitamin A supplementation
- Complementary feeding
- Exclusive breastfeeding

Respondents in the control communities listed the available child survival interventions in their communities as:

- Newborn care
- Exclusive breastfeeding
- Immunisation
- Antenatal care
- Use of LLIN
- Complementary feeding practices
- Management of childhood illnesses
- Vitamin A supplementation

- Hand washing
- Growth monitoring

Perceived benefits to the uptake of child survival interventions as stated by the respondents

Perceived benefits to the uptake of child survival interventions as stated by mothers in experimental communities were:

- Prevent the occurrence of illnesses among children
- Prevent paralysis among children
- Reduction of child mortality
- Reduce mothers hospital visitation
- Available to all children
- Make children grow healthy

Perceived benefit to the uptake of child survival interventions as stated by respondents in the control communities were:

- They prevent diseases
- They are cost effective
- They save time
- Reduce mothers hospital visitations
- They are readily available

The perceived limitation to the uptake of child survival interventions as stated by mothers

The perceived limitation to the uptake of child survival interventions as stated by mothers in the experimental communities were:

- Long waiting time in the hospitals
- Lack of mothers' interest
- Poor attitude of mothers
- Poor community awareness
- Complications from taking interventions
- Ignorance
- Female education and empowerment
- Environmental conditions
- Poor attitude of health workers

The perceived limitations to the uptake of child survival interventions as stated by mothers in the control communities were:

- Long waiting time in the hospitals
- Mothers' educational levels
- Ignorance
- Female education
- Mothers' occupational status
- Distance to the healthcentre
- Poor attitude of mothers
- Poor community awareness
- It is not conducive to sleep inside a mosquito net when the weather condition is hot.
- Fear of the adverse effects of the intervention
- Complications from taking interventions.
- Poor attitude of health workers

4.22 NULL HYPOTHESIS TESTING

Ho1: There is no difference in the uptake of child survival interventions among states in South-west Nigeria.

Analysing the uptake of child survival interventions in the study revealed that there was a significant difference ($p < 0.05$) in the uptake of child survival interventions among the states in South-west Nigeria.

Therefore the null hypothesis is rejected

Ho2: There is no significant relationship between exposure to BCC and preventive practices influencing child survival among mothers of under-five children in South-west Nigeria.

The paired t-test conducted on the impact of BCC on preventive practices of mothers in the study showed that there was a significant relationship ($p < 0.05$) between exposure of mothers to BCC ($P = 0.000$) and preventive practices influencing child survival among mothers of under-five children in South-west Nigeria.

Therefore the null hypothesis is rejected.

Ho 3: There is no significant relationship between child survival intervention uptake and nutritional status of under-five children in the selected LGAs in Nigeria.

Multivariate analysis conducted to assess the relationship between child survival intervention uptake and nutritional status of under-five children in the study revealed that apart from breastfeeding initiation time, uptake of measles and appropriate treatment for suspected pneumonia which was significantly associated with the nutritional status of the children, all other indicators do not have a significant relationship.

Therefore the null hypothesis is rejected for breastfeeding initiation time, uptake of Measles and appropriate treatment for suspected pneumonia.

CHAPTER FIVE

5.1 DISCUSSION

5.1.1 Household Socio-Demographic Characteristics of respondents

The mean age of the mothers in the study was 30.7 ± 6.1 years. This is similar to the report of a mean age of 31.1 ± 5.9 years among caregivers of under-five children by Aigbokhaode et al. (2015) in their study on the health-seeking behaviour among caregivers of under-five children in Edo State, Nigeria. The highest mean age of the mothers was from the urban settlement which corroborates Samuel and Atinmo (2008) study on under-nutrition and household environmental quality among urban and rural children in Nigeria, which reported that the mean age of mothers was higher in medium density urban community than in the rural community. A large number of mothers in the study were between 20-39 years of age. This age range corresponds to the most active age for childbearing. A large proportion of the respondents (76.5%) live in urban settlement due to the urban-rural population ratio.

The majority (94.6%) of the mothers were married. This result is similar to the report of NDHS (2013). The mean number of children per mother (parity) in the study was 2.4 ± 1.4 , with the rural areas having the highest mean number of children per mother.

The mean number of persons per household in the study was 4.5 ± 1.7 , with a slightly larger household of 4.8 ± 2.0 persons per household in rural areas. This corresponds to the findings of NDHS (2013) which reported the mean household of 4.6 with households, slightly larger (4.9 persons) in rural areas than in urban areas (4.2 persons). It is also similar to the average household size of 4.4 persons, indicated in NDHS (2008), but lower than the average household size of 5.0 persons indicated in NDHS (2003).

However, it was higher than the NNHS(2014) report on the average household size of 4.2 persons per household. A large proportion of the households who had mothers and fathers that had completed secondary education were literate and were currently employed. A similar trend of a large proportion of respondents having completed secondary education was literate and was currently employed was reported in NDHS (2013).

The majority(83.5%) of the respondents were literate, and a large proportion of them had secondary education. This is higher than the reports of NDHS in 2003, 2008 & 2013 of a national literacy rate of 48%, 53.7%, and 53.1% among women respectively. Respondents' literacy rate in this study is slightly higher than NDHS in 2003, 2008 & 2013 literacy rate of 79.1%, 79.8%, and 82.0% among women in South-west Nigeria respectively.

The percentage of respondents without any form of education in the study was low (3.7%) compared to NDHS (2008) and NDHS (2013) finding of 12.0% and 8.4% in South-west respectively. There was a significant difference in the educational attainment of respondents among the states and between rural and urban dwellers. The highest percentage of illiterates was from rural areas and the highest percentage of secondary and post-secondary education was from the urban area. This is similar to the trend in 2003, 2008 and 2013 reports. The rate of unemployment among respondents (mothers) in this study is relatively low (3.9%). A high proportion of the mothers were traders, artisans, and civil servants. This result differs from the trend reported in NDHS (2003), but it is similar to the trend in NDHS (2013).

5.1.2 Demographic and Physical Characteristics of the Children

There was no significant difference ($p > 0.05$) in the sampling of male and female under-five children in the study. The mean age of under-five children was 28.8 ± 14.8 months. There was a significant difference ($p < 0.05$) among the states and between the urban and rural residents in the mean age of children. The mean birth weight of children was 3.1 ± 0.6 kg with a significant difference ($p < 0.05$) in the birth weight of children among the three states.

About thirteen percent (12.8%) of the children whose weight were known weighed less than 2.5 kilograms. Children's weight at birth is an important indicator of their vulnerability to the risk of childhood illnesses and chances of survival. Children whose birth weight is less than 2.5kg (low birth weight) have more than average risk of early childhood death (NDHS,2013). Low birth weight (LBW) was more common among children from rural than urban areas. This was similar to the NDHS report of a higher percentage of children with LBW among the rural dwellers. However, the percentage of LBW in this study was higher than the NDHS(2013) report of LBW of 3% among under-five children whose birth weight was recorded at birth.

Also, the distribution of the subjects according to the position of the child in the family depicted that there was a significant difference among the three states, even though they all had a higher proportion of children that were the first position in their family (39.9%, 33.8%, and 41.0% for Ekiti, Oyo and Ogun States respectively).

The cumulative mortality rate (CMR) for under-five children in the study (2012 – 2016) was 52 per 1000 live birth. This is lower than the report of NDHS 2013 (2009 – 2013). The rural settlements had the highest under-five mortality rate compared to the urban settlement. This was similar to the trend in NDHS (2013). Results from both Trussel and Palloni-Heligman variants of the Brass estimation technique suggest that mortality information obtained from women's birth histories provided in the 2003, 2008, and 2013 NDHS could be accepted as reliable. National Population Commission (NPC) and ICF Macro's assessment of NDHS data quality confirmed that NDHS yielded reliable estimates of the true mortality levels in the country. Therefore, the mortality estimate in this study based on the methodology adapted from NDHS (2013) is also considered to be reliable.

The main causes of under-five deaths in this study (malaria, pneumonia, diarrhoea, congenital complications, and measles) were consistent with those obtained by Adeyemi et al. (2008), WHO (2015), WHO(2016), UN IGME(2015), UN IGME (2016) and UNICEF (2017). Also, a study by Grais et al. (2007) on child mortality in three countries

including Nigeria established that preventable diseases such as measles are serious killer diseases in some parts of Niger, Nigeria, and Chad.

5.1.3 Household Physical Characteristics and Socio-economic Status of Respondents

The housing characteristics reflect household's socio-economic situation, which may influence environmental conditions such as the use of biomass fuels and resulting exposure to indoor air pollution that has a direct consequence on the health and welfare of household members.

A large proportion of respondents had improved source of drinking water with the urban residence having the highest respondents with improved sources of drinking water. This is consistent with NDHS (2013) report. Household sanitation facilities showed that a lower proportion had improved toilet facility (30.9%) and proper method of refuse disposal (40.9%) with the highest proportion from the urban areas. NDHS (2013) also reported a lower proportion of household with improved toilet facilities (34.0%) with the highest proportion from urban areas.

Kerosene was the common fuel for cooking used by respondents in this study, and a very high proportion of the respondents had electricity. However, the trend differs from NDHS (2013) report where electricity was reported to be much more common in urban areas than in rural areas (83.6 and 34.4 percent respectively). Both the urban and rural areas had a high percentage (92.9% and 78.8% respectively) in the use of electricity. NDHS (2013) reported that 64% of households (38 percent urban and 83 percent of rural households) in Nigeria used wood as the main type of fuel for cooking. Majority of the participants (94.3%) lived in houses with good healthy flooring materials (cement, ceramic tiles, carpet and so on). Likewise, NDHS (2013) reported that cement was the commonest materials used for flooring in Nigeria.

The trend observed in the household characteristics of respondents in this study is in agreement with NDHS (2013) report that the living conditions across the entire country were mixed. There is also an improvement in Nigerians' access to potable water. The

disparity in household characteristics observed in this study may be attributed to the difference in socio-economic status (SES).

About half of the respondents in the study were from low SES. The study revealed a significant difference between the socio-economic status of respondents according to their place of residence and the state they lived in. Urban residents had a higher proportion of people in middle and high SES. This was consistent with NDHS (2013) report that urban residents had the highest socioeconomic status. Oyo State had the lowest proportion of people in the lower and upper SES and Ekiti and Ogun States had the highest proportion of people in the lowest and highest SES respectively.

5.1.4 Factors influencing the survival of under-five children in the study

The factors influencing the likelihood of survival of under-five children in this study were literacy level of the mother, place of residence, low parity, educational qualification of mothers, living in a house with good healthy flooring materials, and mothers' age at first birth. Mesike and Mojekwu (2012), in their study based on examining the environmental determinants of child mortality in Nigeria, reported that household environmental characteristics had a significant impact on mortality, as lower mortality rates were experienced in households that had access to immunisation, sanitation facilities, good healthy roofing and flooring materials, good and proper refuse and solid waste disposal facilities, as well as those using low polluting fuels as their main source of cooking.

NDHS (2013) also reported place of residence (urban-rural) as one of the factors influencing child mortality in Nigeria. In the same vein, Adedin's (2013) study on the contextual determinants of infant and child mortality in Nigeria showed that region of residence, place of residence, ethnic diversity, community education, community infrastructures, and community health contexts were identified as important contextual determinants of infant and child mortality in Nigeria. It is in line with Desta (2011) theory on the interaction between socioeconomic determinants and proximate determinants influencing infant and child survival.

5.1.5 Level of uptake of child survival interventions in the study

The majority (90.7%) of the respondents were assisted during delivery by skilled health personnel. This was higher than the NDHS(2013) report of 82.5% of mothers assisted by skilled health personnel in South-west Nigeria. A large proportion (72.5%) of children 6-11 months were initiated to breast milk within one hour of birth. NDHS (2013) reported a lower proportion (27.7%) in South-west Nigeria. Exclusive breastfeeding rate for six months among infants was low (19.3%) in this study. The risk of mortality for children in the first two years of life can be increased if children are given suboptimal breastfeeding (Black et al., 2013). However, this rate was higher than 17% reported by NDHS (2013). Only 19.6 percent of the children were introduced to complementary feeding at six months of age. About 76% of the children in the study were supplemented with vitamin A within six months before the survey.

There was an improvement in measles vaccination (78.6%), neonatal tetanus (86.5%), appropriate treatment for diarrhoea using ORS (67.1%), appropriate care for children with suspected pneumonia (72.2%) and the use of LLIN by under-five children (34.5%), compared to NDHS (2013) report of measles vaccination (62.5%), neonatal tetanus 80.7%, appropriate treatment for diarrhoea using ORS (52.6%), appropriate care for children with suspected pneumonia (34.5%) and the use of LLIN by under-five children (16.1%).

There was also an improvement over the findings of NNHS (2014) of overall immunisation coverage of 64% and appropriate treatment for diarrhoea which was about 27% among children living in South-west. About 36% of the under-5 children were reported to have had symptoms of ARI(a cough and short rapid breathing) in the two weeks preceding the survey, of which 72.2% of them were treated with antibiotics. About 35% of the under-five children slept under a mosquito net in South-west the night preceding the survey. This study also showed a variation in the uptake of child survival interventions among the three states. This was similar to the report of NDHS (2013) which reported variation in the uptake of interventions among the zones in the nation.

5.1.6 Factors causing the differences observed in the uptake of child survival interventions among the sampled states in South-west Nigeria

Six variables (socio-economic status, the literacy level of mothers, water treatment method, building materials, availability of health centre/hospital in the community and use of available services in the health centre) were significant predictors influencing the difference in child survival indicators among the states. Aremu et al. (2011) also noted that living in an economically and socially deprived community or neighbourhood is associated with increased risk of under-five mortality. Chirdan et al. (2008) in their study established that formal education as well as health education, significantly improved child survival. Also, Anyamele's (2009) analysis of DHS data of selected sub-Saharan African countries, including Benin and Nigeria corroborated the findings by establishing that literacy is significantly associated with child mortality.

5.1.7 Nutritional Status of Children in the study

The prevalence of wasting, underweight, stunting, overweight, and obesity among under-five children identified in the study is 4.8%, 8.4%, 18.3%, 12.3%, and 13.5% respectively. This was lower than the NDHS (2013) report on the prevalence of wasting, underweight, and stunting in South-west Nigeria of 10.0%, 14.9%, and 22.2% respectively. The prevalence of overweight in this study was higher than NDHS (2013) report of 1.6% among under-five children in South-west Nigeria. A high prevalence (35.0%) of obesity among pre-school children was reported by Henry-Unaeze (2013) in a study on the assessment of food consumption pattern and nutritional status of pre-school children in a rural Nigerian population.

The study revealed a significant difference in the rate of wasting, stunting, overweight and obesity among states and between urban-rural residents. This was similar to NDHS (2013) report of variation in the nutritional status of children among states and between urban-rural residences. Likewise, Senbanjo et al. (2016) in their study on the dietary practices and nutritional status of under-five children in rural and urban communities in Lagos State, Nigeria reported that the prevalence levels of underweight and stunted

children were significantly higher in rural than urban communities (19.4% vs. 9.3%, and 43.3% vs. 12.6%, respectively) in Lagos State.

This study also revealed that under-nutrition decreased at post-intervention in all the states. Likewise, it decreased among children from urban and rural settlements after their mothers had received the intervention. In the control group, there was no reduction in the prevalence of wasting and stunting but there was a reduction in the prevalence of underweight. However, the prevalence of overweight and obesity increased among the states and in urban and rural settlements in both experimental and control groups. The improvement observed in the prevalence of under-nutrition among children from the experimental group as against the control group was due to the impact of the BCC intervention given to the mothers.

5.1.8 Relationship between uptake of child survival interventions and nutritional status of U-5 children

There was an inverse relationship between breastfeeding initiation time and the prevalence of wasting, overweight, and obesity. Breastfeeding initiation below one hour of birth decreased the likelihood of becoming wasted or overweight in the study. The study showed a positive relationship between the uptake of measles vaccine and the likelihood of children not being underweight and stunted; thereby indicating that children who were not underweight and stunted in the study were significantly dependent on their immunisation status i.e. measles vaccination – which was an indicator for determining the completeness of child immunisation status. In the same vein, a positive relationship was observed between children that received appropriate treatment for suspected pneumonia and children not being overweight or obese in the study. It was seen that appropriate treatment for suspected pneumonia increased the likelihood of children not being overweight and obese.

Similarly, Kumar et al. (2006) stated that delayed initiation of breastfeeding, deprivation from colostrum, and improper weaning were significant risk factors for under-nutrition among under-five children. Dipen et al. (2015) also reported that initiation of breastfeeding after an hour of birth, not providing exclusive breastfeeding for 6 months,

unemployment among mothers, having two or more kids, and complementary feeds given by a person other than mother increased hospitalisation. They also reported that starting breastfeeding after an hour of birth, severe malnutrition, and breastfeeding for < two years increased rates of diarrhoea.

Abedi and Srivastava (2012): in a study to assess the immunisation and nutrition status of children less than five years of age in urban and rural Lucknow, observed that fully immunised children had better nutrition status. Findings in Brazil also demonstrated a bi-directional relationship between nutritional status and the duration of diarrhoeal illness (Guerrant et al., 2013). In the same vein, Bello and Joseph (2014) identified some important determinants of infant and child mortality in Oyo State as poverty, malaria, postnatal care, health scheme, and breastfeeding.

5.1.9 Mothers' knowledge and practices influencing child survival

There was a significant improvement in mothers' knowledge of child survival components both among the control and experimental groups. However, the improvement in the control group was minimal compared to the experimental group. This shows that the intervention given had a positive impact on the knowledge of the mothers that received the intervention.

The study also showed an improvement in practices influencing child survival such as the use of mosquito net, hand washing, vitamin A supplementation, appropriate diarrhoea treatment, deworming, immunisation and family planning. Even though there was improvement among experimental and control groups, the control group had a slight increase compared to the experimental group.

5.1.10 Effects of BCC on knowledge and practices of mothers

The study showed a significant improvement in mothers' knowledge and practices of child survival components following the BCC provided to them. There was an improvement of 5.64 ± 3.37 and 8.94 ± 3.17 for mothers' knowledge and practices respectively. The study revealed a large effect (0.74, 0.89) on the knowledge and practices of mothers of the under-five children respectively. The effect of the intervention

on the mothers was in line with the health believe model (HBM) as summarised by Nisbet and Gick (2008) which stated that in order for behaviour to change, people must feel personally vulnerable to a health threat, view the possible consequences as severe, and see that taking action is likely to either prevent or reduce the risk at an acceptable cost with few barriers. In addition, they must feel competent (have self-efficacy) to execute and maintain the new behaviour.

5.1.11 Dietary Pattern of the Children

Factor analysis of the individual food dietary pattern of the children showed the most frequently consumed foods and snack in the study as rice (75.2%), bread (71.6), bournvita/milo (86.9%) and biscuit (75.8%). The study revealed a significant difference in the pattern of consumption of cereals (rice), root and tuber, legumes (akara), snacks (puffpuff), meat and poultry, fish and fish products, milk and dairy, fruits and vegetables by children in the study. The disparity observed in the consumption pattern of these foods among the children in the study may significantly influence their nutritional status.

5.1.12 Nutrient intake of under-five children

The mean intake of nutrients from the total dietary assessment (TDA) showed that a large proportion of the children consumed food that were inadequate in energy, protein, carbohydrate, fiber, fat, vitamin A, vitamin C, folate, calcium, potassium, zinc and iron in comparison with the recommended daily intake (RDI) of energy and nutrients for under-five children based on the total dietary intake. The study also showed a significant difference in the proportion of children with adequate intake of energy, protein, carbohydrate, fiber, fat, vitamin A, and vitamin C, of children among the states, studied. This may be responsible for the variation observed in the nutritional status of the under-five children among the states.

The proportion of children less than five years of age with adequate intake of nutrients increased after their mother had been exposed to the intervention. The mean intake of the children increased at post-intervention for all the nutrients with the exception of zinc which was almost the same at post-intervention. This increase in nutrient intake may be

responsible for the reduction in the prevalence of under-nutrition observed among the children after exposing their mothers to BCC sessions. Chirdan et al. (2008) in their study established that formal education as well as health education, significantly improve child survival.

There was also an increase in the intake of saturated fat among the sampled children at post-intervention. This may be responsible for the increase in the prevalence of overweight and obesity among the studied children observed at post-intervention.

5.2 CONCLUSION

The study identified several determinants of child survival in South-west Nigeria. These determinants include literacy level of the mother, place of residence, low parity, educational qualification of mothers, living in a house with a finished floor and mother's age at first birth.

A significant difference was observed among states in the uptake of child survival interventions with the exception of children immunised against measles. Ekiti State had the highest proportion of under-five children who were immunised against neonatal tetanus, Oyo State had the highest under-five children who were exclusively breastfed for 6 months, initiated to breastfeeding within one hour of birth, introduced to adequate complementary food from 6 months, supplemented with vitamin A, given appropriate treatment for diarrhoea and suspected pneumonia and those that slept under LLIN. Ogun State had the highest proportion of deliveries assisted by skilled personnel and had the lowest level of uptake of other interventions.

Socioeconomic status of households, the literacy level of mothers, water treatment method, building materials, availability of health facilities/hospital in the community and use of available services in the health facilities were the factors that significantly ($p < 0.05$) caused a disparity in child survival indicators among the states in South-west Nigeria.

The study showed an under-five mortality (U5MR) rate of 52 deaths per 1000 live births. The U5MR was higher in rural than in urban settlements. It also revealed a variation in

the mortality rates among the states. The main causes of under-five deaths in South-west Nigeria as highlighted by the study were malaria, pneumonia, diarrhoea, congenital complication and measles.

The prevalence of wasting, stunting, overweight and obesity among the states differs significantly; Oyo State had the highest prevalence of wasting, while Ogun State had the highest prevalence of stunting, overweight and obesity among the children. There was no significant difference in the rate of underweight among the states. There was a significant difference in the nutritional status of children from urban and rural areas. Wasting, underweight and stunting was higher among children from rural areas while overweight and obesity were higher among children from urban settlements.

The prevalence of under-nutrition decreased at post-intervention in all the states studied and among urban and rural dwellers. However, the prevalence of overweight and obesity increased among the states and in the rural and urban settlements. This may be due to the increased consumption of total fat, saturated fat and cholesterol observed in the dietary pattern of children at post-intervention. It was observed that breastfeeding initiation below one hour of birth decreased the probability of becoming wasted or overweight in the study and measles vaccination increased the likelihood of children not being underweight and stunted. This indicated that measles vaccination which is an indicator for determining the completeness of child immunisation status significantly reduce the likelihood of children becoming underweight or stunted. Furthermore, a positive relationship was observed between children that received appropriate treatment for suspected pneumonia and not becoming overweight and obese in the study, thus indicating that appropriate treatment for suspected pneumonia increased the likelihood of children having a healthy weight.

On the whole, the results showed that behavioural change communication through the use of interpersonal communication approach had a great impact in increasing the knowledge and improving practices that influence the survival of under-five children in South-west Nigeria. This improvement in knowledge and practices influencing child survival among the children led to a reduction in the prevalence of under-nutrition among the under-five

children studied. However, the prevalence of overweight and obesity continues to increase indicating the need to conduct more BCC sessions targeting a change in children's dietary pattern as the study revealed that the consumption of total fat, saturated fat and cholesterol increased in the study.

Children from urban settlement had a higher intake of saturated fat and vitamin A compared with children from rural settlements. This study revealed an increase in the nutrient intake of sampled children after their mothers' exposure to the intervention. Saturated fat intake of the children also increased at post-intervention. The adequacy of intake increased at post-intervention for all the nutrients with the exception of zinc which was almost the same as the pre-intervention.

5.3 RECOMMENDATION

Based on the findings of this research, the following recommendations are made:

Government policies and programmes targeting morbidity and mortality among under-five children should be revised to address community variation in the uptake of child survival interventions, to ensure proper implementation and adequate coverage for health intervention programmes in all communities in the nation. The focus on reducing child mortality should be based on community-specific measures that have worked in areas with higher uptake of interventions. This should be applied to other communities and zones in the nation.

There is the need to increase proximity and access to health facilities in all communities in Nigeria to ensure equitable distribution of health services provided in both urban and rural areas. Measures to mitigate rural-urban variation in child survival should be put in place to reduce child mortality by providing basic amenities through public-private partnership initiatives.

Government at all levels should intensify efforts in ensuring that every child is vaccinated since the findings of this study suggest that childhood vaccination, in addition to being a major intervention for reducing child mortality, might also be a tool for reducing undernutrition. In addition, there is the need to strengthen and ensure increased access to

all available family planning programmes in the country, as low parity significantly increased the likelihood of under-five survival in the study.

Behavioural Change Communication (BCC) through IPC approach should be implemented in all communities to improve mothers' knowledge and practices influencing child survival thereby, reducing morbidity and mortality among under-five children in Nigeria, by promoting optimal child survival practices at all levels. It should be a useful strategy at the health facility level to increase the uptake of interventions and promote practices influencing child survival in the community and nation at large.

Furthermore, mothers of under-five children should be encouraged to effectively practise behaviours that influence the survival of under-five children through health intervention promotion programmes and channels that will ensure consistent message delivery. Behavioural change communications on key optimal child survival practices should be given in all communities across the nation to maximise the use of available child survival interventions in the nation.

Finally, government policy should be focused on community-specific determinants of child survival in order to reduce the variation observed in the reduction of under-five mortality in the nation despite the availability of life-saving interventions.

5.4 CONTRIBUTION TO KNOWLEDGE

The study made the following contributions to knowledge:

Providing BCC through the use of interpersonal communication is a key to improving preventive practices among mothers of under-5 children in Nigeria. It increased mothers' knowledge of factors influencing child survival in South-west Nigeria.

Exposure of mothers of under-five children to BCC on child survival improved their knowledge and practices and reduced the prevalence of under-nutrition among the children studied.

The habit of hand washing, use of LLIN, family planning services and proper management of childhood illnesses such as diarrhoea and pneumonia improved among the mothers after their exposure to BCC.

Exposures of mothers to behavioural change communication increased the uptake of vitamin A supplementation, deworming, and immunisation by children in the study area

Initiation of breastfeeding below one hour of birth decreased the likelihood of becoming wasted or overweight. Measles vaccination was also found to reduce the likelihood of children being underweight and stunted.

Finally, appropriate treatment for suspected pneumonia reduced the likelihood of children becoming overweight and obese.

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APPENDIX I

INSTRUMENT FOR DATA COLLECTION (QUESTIONNAIRE)

Greetings,

My name is Bamisaye O. Bukola, a Ph.D. student from the Department of Human Nutrition, Faculty of Public Health, College of Medicine, University of Ibadan, Nigeria. I am currently conducting a research on “effects of behavioural change communication (BCC) on child survival practices among mothers of under-five children in selected southwestern states, Nigeria”.The informationobtained will help policymakers to proffer a possible solution for the improvement of the implementation of interventions given to enhance the survival of under-five children in Nigeria. Your household was selected for the research which will take about 15 to 30 minutes. The answers given will be confidential and participating in the research is not compulsory but we hope that you will agree to be one of our respondents. Youare free to stop the interview at any time.

Therefore we will like to appeal that you will give us the correct and precise answers to the questions.

Thank you very much for your time.

Respondent signature / thumb print _____

Questionnaire code _____

SECTION A – DEMOGRAPHIC INFORMATION

Answer each question as best as you can. Estimate if you are not sure. Please tick the correct answer or fill in the space provided.

Demographic data

S/N	Characteristics	Options	Code
1	Sex of the child	Male (1), Female (2)	
2	No. of persons in the household		
3	Address		
4	Local government		
5	Marital status	Single (1) Married (2) Divorced (3) Widowed (4)	
6	Age at first birth		
7	Religious belief	Christianity (1) Islam (2) Traditional (3)	
8	Ethnic group	Yoruba (1) Ibo (2) Hausa (3) Others specify_____96	
9	Parity		
10	Birth interval	1st child (a), 2nd or 3rd child, interval >2 yrs. (b), 2nd or 3rd child, interval ≤2 yrs. (c), 4th or higher child, interval >2 yrs. (d) 4th or higher child, interval ≤ 2yrs. (e) others specify_____	
11	The position of a child in the family	First (1) Second (2) Third (3) Fourth (4), ≥ Fifth (5)	

SECTION B: Socio-economic and Household Characteristics of Respondent (Mothers of under-five Children)

No	Characteristics	Options	code
1	Educational qualification of mother/ primary care givers	No formal Education(1) Primary education (2) Secondary education (3) HND/Bachelor (4) Postgraduate(5) Others (specify)(96)_____	
2	Educational qualification of father	No formal Education (1) Primary education (2) Secondary education (3) HND/Bachelor (4) Postgraduate (5) Others (specify)(96)_____	
3	Please read this sentence: “The child eats his meal regularly”	Can’t read at all (a) Able to read only parts of a sentence (b) Able to read the whole sentence (c) Blind / visually impaired (d) No sentence in the required language (specify lang.)	
4	Primary occupation of the head of the household (father)	Farmer(1) Trader(2) Artisan(3) Civil servant(4) Unemployed(5) Others-specify(96)_____	
5	Primary occupation of the head of the household (mother)	Farmer(1) Trader(2) Artisan(3) Civil servant(4) Unemployed(5) Others-specify(96)_____	
6	What is the main source of drinking water for members of your household?	Piped water (1) tube well or borehole (2) dug wellprotected well (3) unprotected well (4) water from protected spring (5) unprotected spring (6), rainwater (7) tanker truck (8) surface water (river/dam/ (9) lake/pond/stream/canal (10) OS _____ 96	
7	Location of water source	In own dwelling (1) in own yard/plot (2) elsewhere _____ 3	
8	Distance to a water source?	Minutes _____ Don't know _____ 98	
9	Do you do anything to the water to make it safer to drink?	Yes (1) no (2) don't know 98	
10	What do you usually do to make the water safer to drink? Anything else? CIRCLE ALL MENTIONED	Boil (1) add bleach/chlorine (2) strain through a cloth (3) use water filter (ceramic (4) let it stand and settle (5) alum (6) others (specify)_____ 96, DK (98)	
11	What type of fuel does your household mainly use for cooking?	Electricity(1), Gas(2) kerosene(3) charcoal(4) wood(5) others(specify) _____(96)	

12	Is the cooking usually done in the house, in a separate building, or outdoors?	In the house (1) in a separate building (2) Outdoors (3) OS _____ (96)	
13	Do you have a separate room which is used as a kitchen?	Yes (1) no (2)	
14	The main material of the floor. (Record observation).	Natural floor; sand (1) rudimentary floor; wood planks (2) finished floor; polished wood (3) ceramic tiles / talaxon (4) cement (5) carpet/rug (6) OS _____ (96)	
15	The main material of the roof. Record observation.	Natural roofing ; no roof (1) thatch/palm (2) rudimentary roofing; wood planks(3) Finished roofing; metal/zinc (4) polished wood (5) ceramic tiles (6) cement (7) shingles (8) OS _____ (96)	
16	The main material of the exterior walls. Record observation.	Natural walls; no walls (1) mud (2), rudimentary walls; mud with stone/bamboo (3) plywood (4) Finished walls; cement (5) stone with lime/cement (6) bricks (7) shingles (8) OS _____ (96)	
17	How many rooms in total are in your household, including rooms for sleeping and all the other rooms?	Rooms (total) _____	
18	How many rooms are used for sleeping in your household?	Number of rooms _____ (sleeping) _____	
19	Does any member of this household own: A watch? A bicycle? A motorcycle or motor scooter? A car or truck? and so on	a. Watch (yes; 1, No; 2), b. Bicycle (yes; 1, No; 2), c. Motorcycle/ scooter. (yes;1, No;2), d. Tricycle (yes;1, No;2), e. Car/truck (yes;1, No;2), others (specify _____ (96)	
20	Does any member of this household own any agricultural/ nonagricultural land?	Yes (1) No (2) (IF NO SKIP TO 21)	
21	How many plot/acres/hectares of agricultural land do members of this household own?	Plot _____ (1) acres _____ (2) .hectares _____ (3). 95 or more plots/acres/ hectares. 95 DK... 98	
22	Does this household own any livestock, herds, other farm animals, or poultry?	Yes (1) No (2) (IF NO SKIP TO 23)	
23	How many of the following animals does this household own? Milk cows? Horses/donkeys? Goats? Sheep? Chickens/ Ducks? Pigs? (If none, enter '00'. If more than 95, enter '95').	Cows/bulls _____ Horses/donkeys/mules _____ goats _____ Sheep _____ Chickens/ducks _____ pigs _____ Other (specify) _____	

			(96), DK '98'	
24	Does any member of this household have a bank account?	Yes (1) no (2)		
25	Primary method of refuse disposal	Bush (1) Refuse dump(2) City service(3) burning (4) others(specify) _____(96)		
26	Main type of toilet	Flush or pour flush toilet (1) pit latrine; pit latrine with slab (2) pit latrine without slab/ open pit (3) no facility/bush/field (4) water (5) other specify _____ 96		
27	Do you share this toilet facility with other households?	Yes (1) no (2) (IF NO SKIP TO 28)		
28	How many households use this toilet facility?	No. of households if less than 10 _____, 10 or more households(95) DK (98)		
29	Does your household have: Electricity? Radio? TV? Mobile telephone? A non-mobile telephone? A refrigerator? A cable TV? A generating set? A.C? Computer? Electric iron? A fan?	a. Electricity (yes;1, No;2), b. Radio (yes;1, No;2), c. TV (yes;1, No;2), d. Mobile telephone(yes;1, No;2), e. Non-mobile telephone(yes;1, No;2), f. Refrigerator (yes;1, No;2), g. Cable TV(yes;1, No;2), h. Generating set(yes;1, No;2), i. Air conditioner (yes;1, No;2), J. Computer(yes;1,No;2), k. Electric iron(yes;1, No;2), l. Fan (yes;1,No;2)		
30	Household monthly income	5,000-14,999 (1) 15,000-24,999 (2) 25,000-34,000 (3) 35,000-44,999 (4) 45,000-54,999 (5) 55,000 and above (6) DK (98)		
31	Percentage of income used for food	less than 25% (1) 25-50% (2) 50-75% (3) more than 75% (4) not sure (5)		
32	Number of income-earners in household	More than one (1) One (2)		
33	Type of housing (observe) and ask for the status of residence	a). Mud (1) Concrete (2) OS _____ (3) (b) Owned (1) rented (2)		
34	At any time in the past 12 months, has anyone sprayed the interior walls of your dwelling against mosquitoes?	Yes(1) No(2) DK... 98 (IF NO SKIP TO 34b)		
34a	Who sprayed the dwelling?	Govt. worker/programme(1) private company (2) NGO (3) other(specify) _____96, DK 98		
34b	Does your household have any mosquito nets that can be used while sleeping?	Yes (1) no (2) (IF NO SKIP TO 35)		
34c	How many mosquito nets does your household have?	Number of nets _____		
34d	Ask the respondent to show you the nets in the	Observed, hanged (1), observed not hanged (2) not observed (3)		

	household.		
34e	How many months ago did your household obtain the mosquito net? IF <1 month ago, record '00'	Months ago _____ >36 months ago (95) not sure(98)	
34f	Source of mosquito net? Govt. H/Facility/programme(1) market (2) pharmacist store (3) NGO (4) private company (5) OS _____ (96), DK '98'		
34g	When you got the net, was it treated with an insecticide to kill or repel mosquitos?	Yes (1) no (2) not sure _____ 98	
34h	Did anyone sleep under this mosquito net last night?	Yes (1) no (2) if no (skip to 35) not sure _____ 98	
34i	Who slept under this mosquito net last night? RECORD	Mother and child (1) father only (2) child only (3) other siblings (4) 1&2(5) 1,2&4(5)	
35a	How often do you wash your hands in a day	Number of times _____	
35b	When do you wash your hands (don't probe tick all options mentioned)	Before cooking (a) before breast feeding (b) After toilet (a) before eating (d) on arrival at home (e) others specify _____	
35c	Please show me where members of your household most often wash their hands.	Observed (1) not observed (2) not in dwelling/yard/plot (3) No permission to see (4) other reason _____ (5) (if 2,3,4 skip to 35 e)	
35d	Observation only: observe the presence of water at the place for hand washing.	Water is available (1) water is not available (2)	
35e	Observation only: observe the presence of soap, detergent, / another cleansing agent.	Soap/detergent (bar/liquid/powder/ paste) (a) ash/mud/sand(b) none(c)	
35f	Do you have any soap or detergent or ash and so on in your house for washing hands?	Yes(1) No(2) (if yes can you please show it to me) Yes, shown (1) No, not shown (2)	
35g	Do you receive any orientation/ education on Handwashing	Yes (1) No (2) if no (skip 36)	
35h	Please can you demonstrate (probe minimum seconds spent washing hands)	Can demonstrate (1) cant demonstrate (2) State seconds _____	
36	Please Does anyone smoke in your household	Yes (1) No (2) if No (skip to 39)	
37	If yes; please who smoked	Father (1) mother (2) other (specify) _____ (96),	
38	Please how often does anyone smoke inside your house?	Would you say daily (1) weekly (2) monthly (3) less than monthly (4)	

39	Please is there any health center / hospital in this community	Yes (1) No (2) if No (skip to 43) not sure _____ 98	
40	How long does it take to get to the nearest health centre	<30min (a), 1/2 hour -1 hour(b) >1 hour - 2 hours (c) >2 hours(d) OS _____ 96	
41	Distance of home from nearest health centre	<1 km (a), 1- 5km (b), 6-10km (c). >10km OS _____ 96	
42	Do you use the available services at the health centre?	Yes (1), No. If No, why? _____	
43	Did you have access to information about? A). Healthy pregnancy B). Breastfeeding C). Infant Care D. Infant Nutrition/complementary feeding E). Immunisation F). malaria prevention	A). Yes, (1) specify _____ No (2) B). Yes, (1) specify _____ No (2) C). Yes, (1) specify _____ No (2) D). Yes, (1) specify _____ No (2) E). Yes, (1) specify _____ No (2) F). Yes, (1) specify _____ No (2)	

SECTION C: DIETARY PATTERN: Food frequency questionnaire

This questionnaire is designed to find out how often your child eats particular types of food. Please answer as accurately as possible. Do not leave any blank questions. For each item of food please indicate how many times your child eat it by simply ticking the appropriate number. Thank you for your co-operation and time.

S/N	Types of food/fluid taken	Yes 1	Never 0	Daily				Weekly				Monthly				DK
				1x	2x	3x	>3x	1x	2x	3x	>3x	1x	2x	3x	>3x	
	Did this child (drink/eat):															
1	Plain water?															
2	Juice or juice drinks?															
3	Clear broth (a liquid derived from cooking meat, fish, & vegetables)?															
4	Milk such as A. tinned, B. powdered, or C. fresh animal milk?															
5	Infant formula ((A) Nan, (B) SMA Gold, (C). My Boy, (D) Friso, (E) Lactogen, (F) Peak Milk 123, Cow and Gate, and															

	so on)?																
6	Any other liquids? Specify																
7	Yogurt?																
8	Ice cream																
9	Beverages: (A)Bounvita, (B)milo, (C)caffeine, (D).tea, OS																
10	Any [Commercially fortified baby food like (A) Cerelac, (B) Nutren, (C) Frisolac H, (D) Weatabix, and so on]? Others specify																
11	(A)Bread, (B) rice, (C) noodles, (D) porridge, (E) pap/agidi, (F) boiled maize, (G) cornflakes, (H)custard, (I) goldenmorn or other foods made from grains [e.g. millet, sorghum, maize, wheat and so on] Specify																
12	(A)Pumpkin, (B)Carrots, (C)Cabbage, (D)Eggplant (garden egg), (E)peas, Others (specify)																
13	Roots and Tubers: Yam; (A)white yams boiled, porridge, fried, (B) flour (amala), Cassava: (C) lafun, (D) garri, (E) fufu, (F)Irish/white potatoes cooked, fried, (G) sweet potatoes; cooked, fried, (H) cocoyam cooked, fried. Any other foods made from roots & tubers? Specify																
14	Any dark green, leafy vegetables like (A) spinach, (B) pumpkin leaf, (C) Ewedu, (D) bitter leaf and so on? specify																
15	Fruits; (A) mangoes, (B) pawpaw, (C) orange and so on? specify																
16	Any other fruits or vegetables [e.g. bananas, plantains, watermelon, apples/sauce, green beans, avocados, tomatoes]? Specify																
17	(A)Liver, (B) Kidney, (C) Heart or other organ meats? Specify																
18	Any meat, like;(A) beef, (B) Pork, (C)Lamb, (D) Goat, (E)Chicken, or duck? Other specify																

19	Eggs?																	
20	Fresh or dried fish or shellfish, shrimps, crab, crayfish? State if (A) fried, (B)boiled or (C)smoked; Specify																	
21	Any foods made from beans, peas, lentils, or nuts like (A) beans (B) pottage, (C) moimoi, (D) akara, (E) alapa, (F) gbegiri? Soya Beans; (G) gruel, (H)cake (I)Groundnut, (J)cashew nut, other specify																	
22	Cheese or other food made from milk?																	
23	Any other solid, semi-solid, or soft food? Specify																	
24	Fat & oil; (A) butter, (B) margarine, (C) mayonnaise, (D) palm oil and so on, Specify																	
25	Any snacks; (A) biscuit, (B) Puffpuff, (C) buns, (D) boli, (E) adun, cheese ball, cake, chocolate and so on Specify																	
26	Did this child eat any solid, semi-solid, or soft foods yesterday during the day or at night? (Yes (1) No (0) IF NO SKIP 27)	IF 'YES' PROBE: What kind of solid, semi-solid or soft foods did child eat _____	Quantity taken _____ How much will it cost _____	Weight equivalent. _____														
27	How many times did this child eat solid, semi-solid, or soft foods yesterday during the day or at night?	NUMBER OF TIMES _____	D K															

SECTION D: NUTRIENT INTAKE,

A. 24 Hour Diet Recall

I would like you to tell me everything your child ate or drank after you wake up yesterday morning. Include everything you ate or drank at home and away, even snacks, tea, or coffee. Please be as specific and honest as possible. Thank you.

Item No (a)	Food / Drink Addition (b)	Description of food or Drink (use volume, size or price) (c)	Place taken (d)	Time (e)	Amount (how much did you actually eat/drink?) (f)	Weight equiv. (g)
1. Was the food intake usual? (Y/N) If NO, how was it unusual?			4. Probe for the use of supplement (iron, anti-malaria, vitamins, other supplements) (Y/N), If yes, specify			
2. was it a feast day? (Y/N)			5. Probe for fermented beverages consumed.			
3. Probe for sickness(Y/N): if yes did sickness affect appetite, If yes, how? Increase or decrease.						

SECTION E; CHILD SURVIVAL STRATEGIES: infant feeding practices, immunisation status, and nutrition

Now I would like to ask some questions about your children born in the last five years. (We will talk about the last one in detail)

S/N	Questions and filters	Options	Code
1a	How many times have u being pregnant	Number of times	
1b	How many times have u being pregnant in the last five years	Number of times _____	
2a	Number delivered alive (probe to know a number of miscarriages or stillbirth)	Number D. alive _____ (No. of miscarriages/stillbirth _____)	
2b	Have you ever given birth to a boy or girl who was born alive but later died? IF NO, PROBE: Any baby who cried or showed signs of life but not survive?	Yes (1) no (2)	
3	How many < 5 children do u have now? (probe to know the number living or dead)	Number of Living ____ (1) Dead ____ (2)	
3a	If any dead child probe for causes		
3b	If any dead child probe for age	< 1yrs, (1), 1 to <5yrs (2), >5years (3)	
4	When you got pregnant with this child, did you want to get pregnant at that time?	Yes (1) no (2)	
5	Were you employed during this pregnancy?	No (1), Yes, specify type/hours per day _____ hours (2)	
6a	Did you see anyone for antenatal care during this pregnancy?	Yes (1) no (2)	
6b	Whom did you see? Anyone else? Probe to identify each type of person and record all Mentioned.	Health personnel; Doctor (a), Nurse/midwife (b) CHO/CHEW(C), Mission home (d), Traditional birth attendant (e), OS (96)	
6c	Where did you receive antenatal care during this pregnancy? Anywhere else? Probe to identify each type Of source.	Home: your home (a) Another home (b) Probe to identify each type of Govt. Hospital, Pvt. Hospital/ Clinic (G) Other (specify)	
6d	How many months pregnant were you when you first received antenatal care for this pregnancy?	MONTHS _____ DK _____ 98	
6e	How many times did you receive Antenatal care during this Pregnancy?	Number of times _____ DK __ 98	
6f	Did you receive tetanus toxoid (TT) during this pregnancy	Yes (1) no (2) if yes how many times _____	
6g	Did you receive IPT (e.g. SP) during this pregnancy	Yes (1) no (2) if yes how many times _____	
6h	At any time before this pregnancy, did you receive any tetanus injections?	Yes (1) no (2) if yes how many times _____ DK 98	
7	Where did you give birth to this child?	Govt. Hosp.(1) Pvt. Hosp.(2) Mission homes(3) TBA home (4) at home (5) OS 96	
8	Who attended your delivery?	Doctor (a), Nurse/midwife (b) CHO/CHEW(C), Mission home (d), TBA (e), OS (96)	
9	What was the mode of delivery?	Normal vaginal delivery(1)Caesarean section(2)Forceps delivery(3)	

10	How long after delivery did you stay there? If <1 day, record hours. If <1 week, record days.	Hours ____ (1) days ____ (2) weeks ____ (3) DK. 98	
Infant feeding practices and postnatal care			
11	How long after birth did you first put this child to the breast? (If less than 1 hour, Record '00' hours. If less than 24 hours, record hours. Otherwise, record days).	Immediately ____ 00 Hours ____ Days ____	
11a	Did this child suck the first breast milk after delivery	Yes (1) No (2)	
12	In the first 3 days after delivery, Was this child given anything apart from B/milk	Yes (1) No (2) (IF No SKIP TO 13)	
12a	What was this child given to drink? Anything else? (record all liquids Mentioned).	Milk (other than breast milk) (a), water (b) sugar/glucose water (c) sugar-salt-water solution(e), Infant formula(g) tea/infusions, OS ____ 96	
13	In the first two months after delivery, did you receive a vitamin A dose like (any of this)? Show vitamin A capsules.	Yes (1) No (2)	
14	Are you still breastfeeding this child? / Did you breastfed the child?	Yes (1) No (2)	
15	Did you feed on demand?	Yes (1) No (2)	
16	When did you first introduce water to the child	<4mths (1), 4mths (2), 5mths (3), 6mth (4), > 6mths (5) OS ____ 96	
17	When did you introduce any other fluid/milk/ semi-solid apart from breast milk to the child	<4mths (1), 4mths (2), 5mths (3), 6mth (4), > 6mths (5) OS ____ 96	
18	Did your child drink anything from a bottle with a nipple yesterday or last night?	Yes (1) No (2) DONT KNOW . . . 98	
19a	Did you take your child for a routine monthly check-up?	Yes, where ____ (1) No (2)	
19b	Did you take your child for medical consultation during illness?	Yes, specify number of times ____ (1) No (2)	
Child immunisation, health, and nutrition			
20	Please tell me if this child has participated in any of the following campaigns, national immunisation days and/or Vitamin A or child health week/days	Yes (1) No (2) DONT KNOW . . . 98	
20a	Do you have a card (vaccination card) or book Where this child's vaccinations are Written down? (IF YES: May I see it please?)	Yes, seen (1) (continue in 21), if Yes, not seen (2) or No card (3) (skip to 23)	

21	(1) Copy dates from the card. (2) write '98' in 'day' column if the card shows that a dose was given, but no date is recorded (3) immunisation status (last 12 months): partially immunised (1), fully immunised (2), no immunisation (0) NOTE: DOB = date of birth and CBW = Childbirth weight																																																																																												
	<table border="1"> <tr> <td rowspan="3">DOB</td> <td rowspan="3">CBW</td> <td rowspan="3">In Kg</td> <td rowspan="3">Year</td> <td>BCG</td> <td>OPV₀(Birth)</td> <td>HEP B₀(Birth)</td> <td>OPV₁</td> <td>Penta₁</td> <td>PCV₁</td> <td>DPT₁</td> <td>HEP B₁</td> <td>OPV₂</td> <td>Penta₂</td> <td>PCV₂</td> <td>DPT₂</td> <td>HEP B₂</td> <td>OPV₃</td> <td>Penta₃</td> <td>PCV₃</td> <td>DPT₃</td> <td>HEP B₃</td> <td>MEASLES</td> <td>Vit. A 1st dose</td> <td>YF</td> <td>VA S 2nd dose</td> <td>Zinc</td> <td>Conjugate ACSM</td> <td>POLIO BOOSTER</td> <td>Others specify</td> <td>Others specify</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	DOB	CBW	In Kg	Year	BCG	OPV ₀ (Birth)	HEP B ₀ (Birth)	OPV ₁	Penta ₁	PCV ₁	DPT ₁	HEP B ₁	OPV ₂	Penta ₂	PCV ₂	DPT ₂	HEP B ₂	OPV ₃	Penta ₃	PCV ₃	DPT ₃	HEP B ₃	MEASLES	Vit. A 1 st dose	YF	VA S 2 nd dose	Zinc	Conjugate ACSM	POLIO BOOSTER	Others specify	Others specify																																																													
DOB	CBW					In Kg	Year	BCG	OPV ₀ (Birth)	HEP B ₀ (Birth)	OPV ₁	Penta ₁	PCV ₁	DPT ₁	HEP B ₁	OPV ₂	Penta ₂	PCV ₂	DPT ₂	HEP B ₂	OPV ₃	Penta ₃	PCV ₃	DPT ₃	HEP B ₃	MEASLES	Vit. A 1 st dose	YF	VA S 2 nd dose	Zinc	Conjugate ACSM	POLIO BOOSTER	Others specify	Others specify																																																											
21a	CHECK 21:	BCG TO Measles all recorded (1) Other specify.....(go to 22)																																																																																											
22	Has this child had any vaccinations that are not recorded on this card/book, including vaccinations given in a national immunisation day Campaign, child health weeks? Record 'yes' only if the respondent mentions at least one of the vaccinations in 21 that are not recorded as having been given.	YES (1), (Probe for Vaccinations and Write '98' corresponding Day column in 21) (skip to 25) No (2) (skip to 25) Don't know 98																																																																																											
23	Did this child ever have any vaccinations to prevent him/her from getting diseases, including vaccinations received during NIPD or campaign?	YES (1), (IF yes skip to 23b) NO (2), (IF No, respond to question 23a & 23b and skip to 25) DK... 98																																																																																											
23a	IF NO Why did this child not receive any of the vaccination (Record all reasons mentioned after which answer Q23b and then skip to 25)	had no time (a) It is dangerous to child's health (b) my believe does not allow it (c) not aware of vaccination time (d) distance to health facilities (e) attitude of health workers (f) OS _____ (96)																																																																																											
23b	In your own view is it important for your child to be vaccinated against diseases?	Yes (1), (IF yes why _____) No (2), IF no why _____ then go to 24) DK... (98)																																																																																											
23c	Are you willing to pay for the vaccines if it is no longer available freely	YES (1),NO (2),																																																																																											
24	Please tell me if this child had any of the following vaccinations:																																																																																												
24a	A BCG vaccination against tuberculosis that is, an injection in the arm or shoulder that usually causes a scar? Or was this child given any vaccine at birth (probe)	Yes (1) No (2) DON'T KNOW . . . 98																																																																																											
24b	Polio vaccine, that is, drops in the mouth?	Yes (1) No (2) (IF NO SKIP TO 24E) DK (98)																																																																																											

24c	Was the first polio vaccine given in the first two weeks after birth or later?	First 2 weeks (1), Later (2)	
24d	How many times was the polio vaccine given?	Number of times	
24e	Did your child receive a PENTAVALENT injection	Yes (1) No (2) (if NO skip to 24G) DK (98)	
24f	How many times was the PENTA vaccine given? (PROBE)	Number Don't know...98	
24g	A DPT vaccination, i.e., an injection given in the thigh/buttocks, sometimes at the same time as polio drops?	Yes (1) No (2) (if NO skip to 24I), DK	
24h	How many times was the DPT vaccination given?	Number Don't know...98	
24i	A HEP B vaccination, that is, an injection given in the thigh or buttocks, sometimes at the same time as DPT?	Yes (1) no (2) (if NO skip to 24K) DK	
24j	How many times was the HEP B vaccination given?	Number Don't know... 98	
24k	A measles injection or an MMR injection - that is, a shot in the arm at the age of 9 months or older - to prevent him/her from getting measles?	Yes (1) No (2) Don't know . . . 98	
24l	A yellow fever injection - that is, a shot in the arm at the age of 9 months or older - to prevent him/her from getting yellow fever?	Yes (1) no (2) DK .98	
25	Within the last six months, was this child given a vitamin A dose like any of these? (Show vitamin A capsules)	Yes(1) No (if NO skip to 25c)(2) DK	
25a	Can the mother correctly identify the supplement	Yes (1) no (2)	
25b	If yes the number of doses of supplements received	1 one, 2 two DK .98	
25c	how did they get the supplements	H/center (1), campaign/outreaches (2) Other specify 98	
25d	How many natural sources of vitamin A can mother correctly name	None (1), one (2) two (3) three (4), four(5)	
25e	Can mother voluntary tell the medical effect of vitamin A deficiency	Poor growth (1), night blindness (2), frequent illness (3), death (4), DK (98)	
26	In the last seven days, was this child given sprinkles with iron or any MN powder like (this/any of these)? (Show common types of sprinkles sachets)	Yes (1) no (2) Don't know 98	
27	In the last seven days, was this child given any ready to use therapeutic feeds like plumpy' nuts/ milk like (any of these)? Show the packet	Yes (1) no (2) Don't know 98	
28	Was this child given any drug for intestinal worms in the last six months?	Yes (1) No (2) Don't know 98	
	Do you think it is important for this child to receive a) Vitamin A capsule every six-month b) drug for intestinal worms every six months c) iron or any MN powder	a) Yes (1) No (2) DK ... 98 b) Yes (1) No (2) DK ... 98 c) Yes (1) No (2) DK ...98 if No state reason _____	

29	Has this child had diarrhoea in the last 2 weeks?	Yes (1) No (2) (If No skip to 30), DK (98)	
29a	Was there any blood in the stools?	Yes (1) No (2) Don't know 98	
29b	Now I would like to know how much this child was given to drink during diarrhoea (including breast milk); Probe Further	Much less (1), Somewhat less (2) About the same (3), More (4) Nothing to drink (5) Don't know (98)	
29c	When this child had diarrhoea, was he/she given less than usual to eat, about the same amount, more than usual, or nothing to eat? IF LESS, PROBE: Was he/she given much less than usual to eat?	Much less (1), Somewhat less (2) About the same (3), More (4) Never gave food (5) Stopped food (6) DK.(98)	
29d	Did you seek advice or treatment for diarrhoea from any source?	YES (1) NO (2) (SKIP TO 29g)	
29e	Where did you seek advice or treatment? Anywhere else? Probe to identify each type of source. If unable to determine if public or private sector Write the name of the place. (NOTE If Pharmacy/ Chemist/ Patent Medicine Stores (PMS) was not selected skip to 29f)	Public sector; Govt hospital (a) mobile clinic (b), field worker (c) Private medical sector; Pvt.Hospital/ clinic (d) pharmacy (e), chemist/pms (f) Pvt doctor (g) mobile clinic (h) field worker (i) Traditional practitioner (j) other source (specify) _____	
29e(i)	At the Pharmacy/ Chemist/ Patent Medicine Stores (PMS): A). Was the child examined? B). Did you get advice on the type of medication to buy? C). Did you know exactly what medication to buy and only went there to buy it	Yes No DK A). 1 2 98 B). 1 2 98 C). 1 2 98	
29f	Where did you first seek advice or treatment? (Use Letter Code from 29e)	First place _____	
29f(i)	How many days after diarrhoea began did you first seek advice or treatment for this child? (IF THE SAME DAY, RECORD '00').	DAYS	
29g	Was he/she given any of the following to drink at any time since he/she started having diarrhoea: a) A fluid made from a special packet called ORS? b) A government-recommended homemade fluid?	YES NO DK 1 2 98 1 2 98	
29h	Was he/she ALSO given: [A] Zinc tablets? [B] Zinc syrup?	[A]Yes (1) No (2) DK (98), [B]; Yes (1) No (2), DK (98)	
29i	Where did you get [A] ORS, (B) Zinc (Record options for each)	Government hosp. a) private hospital b) NGO c) pharmacy d) OS _____	
29k	Was anything (else) given to treat diarrhoea?	Yes (1) No (2) (if NO skip to 30), DK (98)	
29l	What (else) was given to treat diarrhoea? Anything else? RECORD ALL TREATMENTS GIVEN.	Pill or syrup antibiotic (A) zinc (B) Antibiotic (C), Non-antibiotic (D), Home remedy/Herbal medicine (E) OS _____ (96)	
30	Has this child been ill with a fever at any time in the last 2 weeks?	Yes (1) No (2) (if NO skip to 32), (98)	
31	At any time during the illness, did this child have blood taken from his/her finger or heel for	Yes (1), no (2) don't know. 98	

	testing?		
32	Has this child had an illness with a cough at any time in the last 2 weeks?	Yes (1) No (2) (if NO & NO in 32 skips to 34, but if NO & yes in 32 skips to 33a), DK (98)	
32a	When this child had an illness with a cough, did he/she breathe faster than usual with short, rapid breaths or have difficulty breathing?	Yes (1) No (2) (skip to 33a), DK (98)	
32b	Was the fast/difficult breathing due to a problem in the chest/to a blocked or a runny nose?	Chest only(1) Nose only(2) Both(3) OS(96) (skip to 42)	
33a	Now I would like to know how much this child was given to drink (including breast milk) during the illness with a (fever/cough)? (If less or more, probe further)	Much less (1), Somewhat less (2) About the same (3), More (4) Nothing to drink (5) Don't know (98)	
33b	When this child had a (fever/cough), was he/she given less than usual to eat, about the same amount, more than usual, or nothing to eat? (If less / more, probe further)	Much less (1), Somewhat less (2) About the same (3), More (4) Never gave food (5) Stopped food (6) DK.(98)	
33c	Did you seek advice or treatment for the illness from any source?	Yes (1) No (2) (skip to 33f)	
33d	Where did you seek advice or treatment? Anywhere else? Probe to Identify each type of source. (NOTE If Pharmacy/ Chemist/ Patent Medicine Stores (PMS) was not selected skip to 29f)	Public sector; Govt. hospital (a) mobile clinic (b), field worker (c) Private medical sector; Pvt. Hospital/clinic(d) pharmacy(e), chemist/PMS (f. mobile clinic(h) field worker (i) Traditional practitioner(j) OS ___(96)	
33d(i)	At the Pharmacy/ Chemist/ Patent Medicine Stores (PMS): a. Was this child examined? b. Did you get advice on the type of medication to buy? c. Did you know exactly what medication to buy and only went there to buy it	YES NO DK a. 1 2 98 c. 1 2 98	YES NO DK b. 1 2 98
33e	Where did you first seek advice or treatment? (Use letter code from 33d).	First place . . .	
33f	At any time during the illness, did this child take any drugs for the illness?	Yes (1) No (2) (if No SKIP TO 34) DK 98	
33g	What drugs did this child take? Any other drugs? Record all mentioned.	Antimalarial drugs; Sp/fansidar amalar/maloxine (A), Chloroquine- (b), Amodiaquin (C), Quinine (D) ACTs (E) Antibiotic Pill/syrup(F) Injection(G) Aspirin(H) Paracetamol (I) Ibuprofen(K) OS) X, DK (Z)	
33h	How long after the fever started did this child first take drugs	Same day(0), next day(1) 2 days after fever(2) ≥3days after fever(3)DK(98)	
33i	For how many days did this child take the drugs? (If 7 days or more, record 7).	Days _____	Don't know . . . 98
34	The last time this child passed stools, what was done to dispose of the stools?	Child used toilet/latrine (1) Put/rinsed into toilet/latrine (2), Put/rinsed into drain/ditch (3), Thrown into garbage(4), buried(5), left in the open (6), river/river banks (7), OS (96)	

35	Have you ever heard of a special product called ORS [Show ORS Packet] you can get for the treatment of diarrhoea?	YES (1), NO (2)	
36	Was childbirth registered	YES (1), NO (2), DK (98)	
36a	If yes, with which authority	NPOPC 1, LGA 2, private clinic/ hospital 3, others specify _____ (98)	
36b	Ask to see the birth certificate	Seen (1) not seen (2)	
37	In the last 12 months, has your household received any medical care, supplies or medicine / psychological/ financial/material/social support for this child, for which you did not have to pay?	None (0) Government (1), private (2), religious(3), charity(4), community(5 OS _____)	
38	Mention any other ways you employed in taking care of your child when ill	Self-medication (1), traditional ways specify ____, (2), OS _____(96)	
39	Has your child ever suffered any prolonged illness in the past	YES (1), NO (2) if NO skip to 40	
39a	what was the duration of the illness	1 month (1), < 2months (2) >2months (3)	
40	Were you ever told by a health or family planning worker about methods of family planning that you could use?	Yes (1), No (2)	
40a	Have you ever heard or seen anything on FP	Yes (1), No (2) if yes where, a) TV b)radio c) newspaper / magazine d) town crier e) posters OS _____	
40b	Do you know of a place where you can obtain a method of FP?	Yes (1), No (2) if yes state where _____ DK... 98	
40c	Are you currently doing something or using any method to delay or avoid getting pregnant?	Yes (1), No (2) if No skip to next section	
40d	Which method are you using? (Circle all the methods mentioned)	Female/Male Sterilization(A) IUD (B)Injectable (C)Implants (D)Pill (E) Condom(F) Diaphragm(G) Foam /Jelly (H) Standard Days method(I) Withdrawal (J) Another modern method (K) Another traditional method (l _____)	
40e	Where did you obtain (current method) the last time?	Govt. hosp.(a) Pvt. Hosp.(b) pharmacy(c), chemist/ PMS (e) FP clinic (g) OS _____	

SECTION F: NUTRITION STATUS ASSESSMENT: ANTHROPOMETRIC MEASUREMENTS

S/N	INDICIES	MOTHER	CHILD	code
1	Sex		Tick: Male () Female ()	
2	Age	(years)	Date of birth _____	
3	Weight (kg)			
4	Height/length (cm)	(m)	(cm)	
5	Measured lying down or standing up?		Lying down (1) standing up (2)	
6	Mid-upper arm circumference (cm)			
7	Birth weight / mothers perceived baby size	In kg _____ small	If DK () then was baby (a) Average or large (b) Small or very	
8	Mode of delivery of this child		Non-caesarean (a) Caesarean section (b)	
9	Pregnancy Status: check or if pregnant		Yes (1) No (0)	
10	Was the child undress to the minimal		Yes (1) No (0)	

Thank you for giving us your time.

SECTION G: Section on knowledge and practices influencing child survival (administered only to respondents sampled for intervention at pre and post-intervention level)

Please answer all questions.

S/N	Questions	Options	Score
Knowledge questions			
1	Under-five children should receive Vitamin A capsule every six month	Yes (), No ()	
2	It is important for under-five children to receive the drug for intestinal worms every six months	Yes (), No ()	
3	What do you think causes diarrhoea in young children	_____	
4	What materials are needed for effective hand washing?	_____	
5	What diseases can be contracted by not washing hands?	_____	
6	Breastfeeding should be initiated within the first hour of birth? And the first food for babies should be breast milk	Yes (), No () Yes (), No ()	
7	In the first six months, infants need water and/or other drinks in addition to breast milk?	Yes (), No ()	
8	After the first six months, infants need other food and drinks in addition to breast milk?	Yes (), No ()	
9	What is the medical effect of vitamin A deficiency	Poor growth (), night blindness (), frequent illness (), death ()	
10	In your own view is it important for your child to be vaccinated against diseases?	Yes (), No ()	
11	Is it important for you and your household to sleep under ITN or LLIN?	Yes (), No ()	
12	Using any family planning method to delay or avoid getting pregnant as directed by a health or family planning worker is important in ensuring the health of both mother and child?	Yes (), No ()	

Practice questions		
1	Does your household have any mosquito nets that can be used while sleeping (Ask the respondent to show you the nets in the household)?	Observed, hanged (), observed not hanged () not observed ()
2	Did your under-five child slept under the mosquito net last night	YES (), NO ()
3	Did another member of your household slept under the mosquito net last night	YES (), NO ()
4	How often do you wash your hands	_____
5	What do you use for washing your hands?	_____
6	How do you wash your hands (Please can you demonstrate)	Can demonstrate (1) cant demonstrate (2) State seconds _____
7	When do you wash your hands (don't probe tick all options mentioned)	Before cooking (a) before breast feeding (b) After toilet (a) before eating (d) on arrival at home (e) others specify _____
8	Within the last six months, was this child given a vitamin A dose like any of these? (Show vitamin A capsules)	Yes(), No ()
9	Was this child given any drug for intestinal worms in the last six months?	Yes(), No ()
10	How was the child with diarrhoea treated and What was given	Measures taken _____
11	When your child has diarrhoea, how much do you give him or her to drink or eat?	a. More than usual b. About the same c. Less than usual d. Nothing to drink e. Don't know
12	Child immunisation status (in the last 12 months): confirm this from child vaccination card, if not available ask follow-up questions from section E question 20-24l	no immunisation () partially immunised (), fully immunised ()
13	Are you currently doing something or using any method to delay or avoid getting pregnant?	Yes (), No ()

APPENDIX II

IWE IBEERE

Ekukale,

Oruko mi ni Bamisaye. O. Bukola, mo n keko lati gboye Omowe (PhD) ni EKA-IKEKO imo “Ounje ti o n Dena Aisan ni Ago Ara” ni Oriko EKA-IKEKO “Eto Ilera Ara Ilu” eyi ti o wa labe akoso Ile-Eko “Isegun Oyinbo” ti Yunifasiti ilu Ibadan ni orile ede Nigeria. Lowolowo, mo n se iwadi ijinle lori awon oun to le sokunfa, ati ipa ibanisoro ti fa iyipada iwasi fun iwalaaye awon omode ti ojo ori won o ti ju odun marun lo ni iha gusu-iwo oorun orile ede Nigeria. Abajade iwadi yi yio ran ijoba lowo lati dena iku awon omo wewe ati lati mu imudagba ba awon ewe ti odun won ko ti ju marun lo ni orile ede Nigeria.

A pinle yan idile re fun iwadi yi, ibeere wa kii gbani lakoko ju iseju marundogun si ogbon iseju lo. Gbogbo idahun si ibeere yin ni a ko niba eniken yato si iko oluwadi yi so. A si lero wipe e ti gba lati fesi si awon ibeere wa, nitoripe idaun yin se pataki si wa. Ti a ba si beere ibeere kan ti e ko fe lati dahun si, e je ka mo , a o si koja lo si ibeere ti o te le. Bakannaa, e leto lati fopin si iforo-wani-lenuwo na. A si ro yin lati fun wa ni esi ti o je ododo si awon ibere wa gbogbo.

E se gidigidi fun akoko yin.

IBOWOLUWE/ITEKA OLUDAHUN _____

KOODU IWE IBEERE _____

APA KINNI IBEERE- ALAYE LORI IBI ATI ISESI

Dahun ibeere kookan bi o se lagbara lati dahun re si, ki o si gbe awon ibeere na yewo daradara ti o ba ru e loju. Jowo fi amin si idi eyi ti o je ojulowo idahun re tabi ki o ko nkan si alafo ti a fi sile.

DATA IBI ATI ISESI

S/N	GBOLOUN ISE	ASAYAN	KOOD U
1	Imo ako tabi abo	Okurin(1), Obirin(2)	
2	Iye eniyan to ngbe ile		
3	Adiresi Ibugbe		
4	Ijoba Ibile		
5	Se o ti ni oko	Apon(1), Ayaleko/Baale(2), Ilemosu(3), Opo(4)	
6	Odun melo lo je nigba ti o bi akobi re		
7	Esin to nse	Onigbagbo(1),Musulumi(2),Esin abalaye(3)	
8	Eya-Ede re	Yoruba(1),Igbo(2),Hausa(3),Eya-Ede miran	
9	Iye omo ti o ti bi		
10	Odun melo-melo lo wa larin won	Akobi(a),ikeji tabi iketa, ko to odun meji(b),ikeji tabi iketa, o ju odun meji(c),ikerin tabi atele, ko to odun meji(d),ikerin tabi atele, o ju odun meji(e)	
11	Ipo ti omo ti a nsoro yi yan si ninu ebi	Ipo kinni(1), keji(2), keta(3),kerin(4),karun(5)	

APA KEJI- Igbe aye ati isesi oludahun (Iya omo ti ko to odun marun)

No	Characteristics	Options	code
1	Iwe melo ni Iya omo yi ka	Ko kawe(1),Ile-iwe alakobere(2),Ile-iwe Girama(3),O kawe gboye(4),O kawe koja ipele ikeko gboye(5)Tabi omiran, salaye	
2	Iwe melo ni Baba re ka	Ko kawe(1),Ile-iwe alakobere(2),Ile-iwe Girama(3),O kawe gboye(4),O kawe koja ipele ikeko gboye(5)Tabi omiran, salaye	
3	Mo fe ki o ka iwe yi simi	O lee ka(a), O kan le ka die ni(b), O le ka gbogbo re(c), O fo loju/ko riran kedere(d), ko gbede ti a fi kowe naa (so ede ti o gbo)	
4	Ise wo ni baale n se	Agbe(1), Onisowo(2), Onise owo(3), Osise Ijoba(4), Ko ni ise(5), Omiran(salaye)	
5	Ise wo ni Iyawo n se	Agbe(1), Onisowo(2), Onise owo(3), Osise Ijoba(4), Ko ni ise(5), Omiran(salaye)	
6	Orisun wo ni idile yi ti n pon omi mimu	Omi Ero(1), Kanga-dero(2), Kanga ti a de lori(3), Kanga ti a ko de lori(4), Omi inu okuta ti a de lori(5), Omi inu okuta ti a ko de lori(6), Omi Ojo(7), Omi ti a fi Oko gbe wa(8), Omi odo(9), Omi adagun(10), Orisun miran(salaye)___	
7	Ibo ni omi naa wa	Inui le ti a ngbe(1), Agbala ile ti a ngbe(2), Ibo miran(3) _____	
8	Akoko melo lo ma n gba yin lati pon omi wale lat orisun omi na	Iye iseju..... Nko mo	
9	Nje oun kan wa ti o ma nse si omi na lati le je ki o dara fun mimu	Beeni(1), Beeko(2), Nko mo	
10	Kini oun ti o ma nse lati lee je ki omi naa se mu (kale mo gbogbo eyi ti o yan)	Sise(1), fi oogun apa kokoro si(2), Fi aso se(3), Fi ase se(4), Fi sile ko le sile(5), Fi ALUM si(6), Oun miran(salaye)	
11	Kini idile re fi ndana ounje	Ina Ijoba(1), Gaasi(2), Epo barafin(3), Eedu(4), Igi(5), Oun miran(salaye) _____	
12	Se inu ile yin le ti ma ndana, tabi ile miran ti o da duro, tabi Ita gbangba	Inui le wa(1), Ile miran ti o da duro(2), Iwaju ita gbangba(3) Ibo miran to yato(salaye)	
13	Nje o ni yara oto ti an n lo gege bi ile idana	Beeni(1), Beeko(2)	
14	Kini oun ti a fi se ile Ile naa	Yepe(1), Pako(2), Igi ti a dan(3), Awo(4), Simenti(5), Kapeeti(6), Oun miran(salaye) _____	
15	Kini oun ti a fi se Orule ile na	Ko Si Orule(1), Ewe/Imo Ope(2), Pako(3), Paanu Ikole (4), Igi (5), Awo (6), Simenti (7), Orule igbalode tabi oun miran (salaye) _____	
16	Oun elo ti afi se ogiri ile nita (ko akiyesi re sile)	Ko si ogiri (1), Amo (2), okuta/oparun (3) patako (4), Sementi(5), kankere (6), Biriki (7), Yepe okun (8), Oun miran (Salaye)	
17	Yara melo lo wa ninu ile re, pelu awon yara ibusun ati awon yara miran.	Iye gbogbo yara _____	

18	Yara melo lo wa fun sisun	Iye yara to wa fun sisun _____	
19	Nje a ri eni to ni Aago, Keke, Alupupu, Oko ayokele, ati be be lo ninu awon to ngbe ninu ile naa.	Aago-beeni(1,beeko(2), Keke-beeni(1)beeko(2), Alupupu-beeni(1)beeko(2), Keke elese meta-beeni(1)beeko(2), Oko ayokele/Ajagbe-beeni(1)beeko(2), Oun miran(salaye)____	
20	Nje a ri eni to n gbe ninu Ile na to ni Ile-Oko, tabi Ile miran	Beeni1,beeko(2)- Ti o ba je beeko, koja si ibeere kokan le logun	
21	Iwon ile oko melo ni idile yi ni	Ploti.....(1),Eka.....(2),Ekta.....(3),	
22	Nje idile yi ni oun osin, Maalu, tabi eran osin miran tabi ile osin Adiye	Beeni(1)beeko(2) to ba je beeko koja lo si ibeere keta le logun	
23	Iye melo ni idile yi ni ninu awon eran osin ti a fe daruko wonyi	Malu____,Esin/Jeki____,Ewure____,Aguntan____,Adiye/Pepeye____,Elede____,	
24	Nje a ri eni ti o ni Bank accounti ninu idile yi?	Beeni(1), beeko(2)	
25	Ona wo ni idile yi ngba lati da awon panti won nu	Inu igbo(1),Ori Aatan(2),Ibi idalenu ti Ijoba pese(3),Jijo(4),tabi ibo miran(salaye)	
26	Iru ile igbonse wo ni idile yi nlo	Alawo(1),Salanga ti a de(2),Salanga ti a ko de(3),Inu Igbo(4),Inu Odo(5),Ibo miran (salaye)	
27	Nje idile yin lo ile igbonse yi pelu elomiran	Beeni(1), Beeko(2), to ba je beeko ni, koja lo si ibeere keji-dinlogbon	
28	Idile melo lo n lo ile igbonse naa	Iye idile ti ko ba pe mewa.....,Idile to pe mewa tabi ju bee lo-----, Nko mo	
29	Nje idile yin lo ina ijoba? Redio asoro ma gbesi? Telifisan Ero ibara-eni-soro alagbeka? Telifoni ori tabili? Ero amomitutu? Telifisan igbalode? Ero amunawa? Ero Amuletutu? Ero iloso? Abibe oyinbo? Ero ayara bi asa?	Ina ijoba Beeni (1), Beeko (2), Redio asoro ma gbesi Beeni (1), Beeko (2)? Telifisan Beeni (1), Beeko (2), Ero ibara-eni-soro alagbeka Beeni (1), Beeko (2)? Telifoni ori tabili? Beeni(1), Beeko(2),Ero amomitutu?Telifisan igbalode Beeni(1), Beeko(2),?Ero amunawa Beeni(1), Beeko(2),? Ero Amuletutu Beeni (1), Beeko (2)? Ero iloso Beeni (1), Beeko (2)? Abibe oyinbo Beeni (1), Beeko (2)? Ero ayara bi asa Beeni (1), Beeko (2)?	
30	Iye owo to n wole fun idile yi losun	5,000-14,999 (1) 15,000-24,999 (2) 25,000-34,000 (3) 35,000-44,999 (4) 45,000-54,999 (5) 55,000 and above (6) DK (98)	
31	Ida melo ni idile yi fi n jeun ninu re losun?	less than 25% (1) 25-50% (2) 50-75% (3) more than 75% (4) not sure (5)	
32	Eniyan melo lo n sise owo ninu idile yi	O ju eyokan(1), Eyokan(2)	
33	Irufe ile naa (wo fun rare) ati Talo ni ibugbe naa	Ile Alamo(1) Ile oni kankere(2) oun miran(salaye)_____ A ni funra wa(1) A ya ile na fun gbigbe(2)	

34	Ni bi osun mesan seyin, nje enikeni ti fi oogun efon si ibugbe yi	Beeni(1) Beeko(2) Nko mo, ti o ba je beeko, koja lo si ibeere 34b	
34a	Ta lo fi oogun efon si ibugbe naa	Osise Ijoba(1) Osise aladani(2) Ajo ti ki se ti ijoba(3) Awon miran(salaye) _____	
34b	Nje idile yi ni apo efon ti won lee ta ti won ba fe sun	Beeni(1) Beeko(2), ti o ba je beeko koja lo si ibeere karun le logbon	
34c	Apo efon melo ni idile yi ni	So iye apo efon	
34d	So fun ki o fi apo efon naa han e	Sakiyesi apo efon naa boya o wa ni tita(1)sakiyesi re boya ko si ni tita(2)Nko rii(3)	
34e	Bi osun melo sehin ni idile yi ti gba apo efon yi (ti o ba je osun kan sehin, koo sile)	Osun kan(1)Osun merin-din-logoji sehin(2)Ko da mi loju	
34f	Ibo lo ti gba apo efon yi	Odo Ijoba(1) Oja(2) odo awon ton ta oogun(3) Ajo ti ki se ti ijoba(4) Ile ise aladani(5) Ibo miran(salaye)	
34g	Igba ti o gba apo efon yi, nje won fi oogun efon si lara ko ba le ma pa efon	Beeni(1) Beeko(2) Ko da mi loju	
34h	Nje enikeni sun sabe apo efon naa moju oni	Beeni(1) Beeko(2), ti o ba je beeko, koja lo si ibeere karun din logooji	
34i	Ta lo sun sabe apo efon yi moju (ko sile)	Iya ati omo(1) Baba nikan(2) Omo nikan(3) Awon Omo miran(4),1&2(5) 1,2&4(5)	
35a	Igba melo lo ma n fo owo re lojumo	Iye Igba _____	
35b	Igba wo lo ma n fo owo re si (ma se wadi, kan fala sidi asayan to ba so)	Ki o to se onje(a) Ki o to fomo lomumu(b) To ba se gbanse tan(c) Ki o to jeun(d) Ti o ba de sile(e) Igba miran(salaye)	
35c	Jowo fi ibi ifowo naa han	Mo foju ri(1)Nko foju ri(2)Ko si ninu ibugbe naa(3)Ko gba mi laye lati foju ri(4)Idi miran	
35d	Sakiyesi boya Omi, Ose tabi oun ifowo miran wa nibe	Omi wa nibe(1) Omi ko si nibe(2)	
35e	Sakiyesi boya Ose tabi oun ifowo miran wa nibe	Ose(sigidi,olomi,oniyefun,teporo)(a) Eeru,Odo,Erupe(b) Kosi nkankan(c)	
35f	Nje o gba idanileko lori owo fifo	Beeni(1)Beeko(2),To ba je beeko, koja lo si ibeere keta-din-logoji	
35g	Nje o le sapejuwe bi o se nfowo yi, iye iseju to nlo lati fowo	O le sapejuwe(1) Ko le sapejuwe(2), So iye iseju _____	
36	Nje enikeni n mu Siga ninu idile naa	Beeni(1) Beeko(2)To ba je beeko, koja lo si ibeere okan-din-logooji	
37	To ba je beeni, ta lo n mu Siga ninu idile naa	Baale(1) Iya(2) Elomiran(salaye) _____	
38	Igba melo ni eni naa ma n mu siga ninu ile yi	Ojoojumo(1) Ose-ose(2) Osoosu(3) Ko to osu(4)	
39	Nje ile iwosan kankan wa ni ilu yi	Beeni(1) Beeko(2) To ba je beeko, koja lo si ibeere 42, ko damiloju ...98	
40	Bi wakati melo ni o ma lo lati de ile iwosan naa	<30min(a), 1/2 hour -1 hour(b) >1 hour - 2 hours (c) >2 hours(d) OS _____ 96	

41	Bawo ni ile iwosan naa se gina si ile odoyin si	<1 km (a), 1- 5km (b), 6-10km (c). >10km OS _____ 96	
42	Nje e ni imo lori Awon nkan wonyi, (A) Ilera oyun, (B) Fifomo lomu (c) Itoju omo owo (D) Ounje omode (E) Ajesara	Beeni (salaye) _____ (1) beeko (2) b). Beeni (salaye) _____ (1) beeko (2), c). Beeni salaye) _____ (1) beeko (2), d). Beeni (salaye) _____ (1) beeko (2), e). Beeni(salaye) _____ (1) beeko (2)	
43	Nje o n samulo awon eto to wa ni ile iwosan	Beeni (1) Beeko (2) salaye ti o ba je beeko _____	

APA-KETA- BI A SE N JE ONJE WA LONA TO LE GBA SARA LOORE

A se ibeere wonyi lati wadi igba ti omo yi ma n jeun si ati irufe onje ti o ma nje, E jowo e so otito iru onje ti o ma nje nipa fifi amin sori nombra to ye. E seun fun ifowosowopo ati akoko yin.

S/ N	IRUFE ONJE/OMI	beeni	Ko je Rara	Lo Ojojumo				Lo Ose				Lo Osu				DK	
				1x	2x	3x	>3x	1x	2x	3x	>3x	1x	2x	3x	>3x		
	Nje Omo yi jeun tabi mu omi	1	0														
1	Omi lasan																
2	Eso tabi omi Eso																
3	Omi ti a fa lati ara Eran,Eja ati Efo																
4	Wara-Alagolo(a)Oniyefun(b)Wara oojo(c)																
5	Onje omode-NAN(a)SMA Gold(b)My Boy(c) Frizo(d) Lactogen(d) Peak Milk(e) Cow and Gate (f) and so on																
6	Omi miran(salaye)																
7	Yougort																
8	Ice cream																
9	Oun mimu bi- Bornvita, Milo, Caffein, Tea.																
10	Ounjeomodeto n ta loja bi- (A)Cerelac,(B)Nutrien(C)Frisolac H.(D)Weatabixand so on, specify																
11	Bredi, Iresi,Noddle,Asaro,Ogi,Agbado ise, Conflakes, Custard, Golden Mom tabi Ounje miran ti a fi agbado se																
12	Elegede, karooti,Eso-kabeeji,Igba,Ewa-kokondo,Oun miran.																

13	Oun Ogbin- (A)Isu sise, Asaro isu,Isu dindin,(B)- Iyefun-Amala. Ege(C)Lafun,(D)Gaari, (E)Fufu,(E)Anama funufun sise,Dindin, (G)Odunkun, sise, Dindin,(H)Koko,sise,Dindin,Ounje miran ti a se latara oun ogbin.																	
14	Awon Efo Elewe bi-Amunututu,Ugu,Ewedu,Ewuro																	
15	Eso- Mongoro, Ibepe, Osan, bbl																	
16	Eso tabi Efo miran-Ogede-wewe,Ogede-Agbagba,water-melon (eso-bara),Apu,Ewa-alawo-ewe,Avocado(piha oyinbo),Tomato																	
17	Edo, Kindinrin, Fuku, tabi Inu Eran miran																	
18	Eran-Nama, Elede, Agbo, Ewure, Adiye, Pepeye,Eran miran																	
19	Eyin																	
20	Eja tutu tabi gbigbe tabi Eja Onipe, Ede, Akan, salaye boya sise ni, sisun, didin-omiran to yato.																	
21	Ounje ti a fi ewa se tabi epa-Ewa, Asaro, Moimoi, Akara, Alapa, Gbegiri, Akara oyinbo,Epa,gruel, Epa Kasu tabi omiran																	
22	Wara tabi ounje miran ti a fi omu Malu se																	
23	Ounje okele miran																	
24	Ora ati Epo-Bota, magarin, mayonnaise, Epo																	
25	Awon Ipapanu- Bisikiti, pofu-pofu																	
26	Nje Omo yi n je ounje Okele, eyi ti o le die, tabi ounje ti ko le- ni ana nigba osan tabi ni asale? (beeni (1) beeko (0) If NO Skip 27)	Ti o ba je beeni; iru ounje Okele tabi to le die, tabi ounje ti ko le- ni omo yi je _____	Melo lo je _____ O to bi elo _____	Iwon ounje _____														
27	Igba melo ni omode yi ma n je ounje okele tabi ounje ti o le die, ounje ti ko le- ni ana nigba osan tabi asale?		Igba melo _____	DK														

APA KARUN- ETE TI OMODE FI WALAAYE

Asa ti omode fi n jeun, bo se gbabere ajesara si ati awon oun asara lore ti o nje. Nisisyi mo fe beere nipa omo ti o bi ni odun marun seyin. (A o soro nipa abigbeyin re).

S/ N	Questions and filters	Options	Cod e
1a	Igba melo ni e ti loyun seyin	Iye igba _____	
1b	Igba melo ni e ti loyun laarin odun marun seyin	Iye igba _____	
2a	Melo ninu won ni e bi laaye(wadi fun abiku tabi oyun ti o baje)	Iye ti e bi laaye _____ (iye abiku tabi oyun ti o baje _____)	
2b	Nje o ti bi okurin tabi obinrin ti o wa laaye sugbon ti o pada ku? (Ti o ba je beeko, beere fun eyi ninu awon omo naa ti o ke tabi gbiyanju lati wa laaye sugbon ti o pada ku).	Beeni (1) Beeko (2)	
3	Melo omo ti o ti pe omo odun (<5) ni e ni bayii (beere lati mo iye awon to ti ku tabi to wa laaye)	Iye to wa laaye _____ (1) Iye to ti ku _____ (2)	
3a	Ti a ba ni eyi ti o ti ku, beere fun idi re ti o fi ri bee		
3b	Ti a ba ri eyi ti o ti ku, beere fun ojo ori to je ko to ku	Ko to odun kan(1), Odun kan si omo ti o tip e marun (2) omo to ti ju odun marun lo (3)	
4	Igba ti e loyun omo yi, nje e fe lati loyun nigba naa	Beeni (1) Beeko (2)	
5	Se oun se ise ni igba ti e loyun omo yi.	Beeni (1) Beeko (2)	
6a	Nje o lo si ile itoju awon alaboyun ni igba to wa ninu oyun	Beeni(1)Beeko(2)	
6b	Ta ni eni ti o ri nibe (Beere lati le mo iru eni gangan ti o ri, ki o si ko gbogbo eni ti o so sille)	Osise eto ilera- Dokita (a) Noosi/Agbebi (b) Osise eto ilera (c) agbebi (d) Oni isegun ibile(e) Elomiran (96)	
6c	Nibo lo ti gba itoju alaboyun ninu oyun (Beere lati mo gbogbo ibi ti o ti gba itoju fun oyun naa).	Ile re (a) Ile miran(b) Ile iwosan ijoba(c) Ile iwosan aladani(d) Ibo miran(salaye)	
6d	O ti wa ninu oyun to bi osu melo nigba ti o koko gba itoju fun oyun naa	Iye osu _____ Nko mo (98)	
6e	Igba melo lo gba itoju ninu oyun naa	Iye igba _____ Nko mo (98)	
6f	Se o gba abeere ajesara tetanus toxoid (TT) ninu oyun naa	Beeni (1) Beeko (2) ti o ba je beeni, igba malo le gba _____	
6g	Se o gba abeere ajesara IPT (SP) ninu oyun naa	Beeni (1) Beeko (2) ti o ba je beeni, igba malo le gba _____	
6h	Se o gba abeere ajesara TT ni igba Kankan ko to ni oyun naa	Beeni (1) Beeko (2) ti o ba je beeni, igba malo le gba _____	
7	Nibo le bi omo yi si	Ile iwosan ijoba(1) Ile iwosan aladani(2)Ile agbebi ti mission (3) Ile agbebi ti ibile(4) ile yin (5) Ibo miran(salaye) (96)	
8	Ta lo gbe bi yin	Osise eto ilera- Dokita (a) Noosi/Agbebi (b) Osise eto ilera (c) agbebi ti mission (d) Oni isegun	

	ibile(e)Elomiran _____ (96)		
9	Bawo lo se bi omo na	o bi fun ra re (1) ise abe na se (2) pelu iranlowo awon oni segun oyibo (3)	
10	Bawo lo se pe to ki o to kuro nibi ti o bimo si	Wakati _____ Ojo _____ Ose _____ Nko mo _____ (98)	
Infant feeding practices and postnatal care			
11	Bawo lo se pe to ko to fomo lomu lehin igba to bi omo tan	Esekese(1) Iye wakati _____ (2) Iye ojo _____ (3)	
11a	Nje omo naa mu omi omu akoko lehin igba ti a bi	Beeni(1)Beeko(2)	
12	Nje omo yi mu nkan miran yato si omu laarin ojo meta akoko ti a bi	Beeni(1) Beeko (2) Ti o ba je beeko koja lo si ibeere ketala (13)	
12a	Kini oun miran ti a fun omo naa mu (ko gbogbo re sile)	Wara miran to yato si omu(a) Omi(b) Omi to ni suga ninu(c)Omi ti oni adalu suga ati iyo ninu (d)Awon oun ti a se ni mimu fun omo owo(e) Tea, oun miran salaye	
13	Leyin osun meji ti o ti bimo, nje o gba oogun vitamin A (bi iru eleyi- fi capsule won)	Beeni (1) Beeko (2)	
14	Nje o si n fun omo yii lomu / se o fun omo yii lomi ri	Beeni (1) Beeko (2)	
15	Se ti omo yii ba beere lo ma n fun lomu ati ounje	Beeni (1) Beeko (2)	
16	Igba wo lo koko fun omo yii ni omi mu	Ko to pe Osu merin (1) Osu merin (2) osu marun (3) Osu mefa (4) O ju osu mefa lo (5)	
17	Igba wo lakoko fun omo yii ni oun mimu miran tabi onje ti o yato si omu	Ko to pe Osu merin (1) Osu merin (2) osu marun (3) Osu mefa (4) O ju osu mefa lo (5)	
18	Nje omo naa mu oun mimu to jade lati inu igo ti ori re da bi ori omu lana tabi ni ale ana	Beeni (1) Beeko(2) Nko mo	
19a	Nje o ma n mu omo re lo fun ayewo lorekore ni ile iwosan	Beeni,(1) to ba je beeni ibo le man lo _____ Beeko(2)	
19b	Nje o ma n mu omo re lo fun ayewo ni ile iwosan ni igba ti ara re ko ba da	Beeni,(1) to ba je beeni emelo le ti lo _____ Beeko(2)	
Child immunisation, health,and nutrition			
20	Jowo so fun mi boya omo yi ti bawon kopa ninu eto abere ajesara Kankan ri (bi ayajo igbabere ajesara tabi ayajo eto ilera awon omo wewe)	Beeni (1) Beeko (2) Nko mo. (98)	
20a	Nje o ni kaadi tabi iwe palabe ibi ti won ko abere ajesara ti omo yi gba si?	Beeni(1) tesiwaju ni ibeere kokan le logun (21); Beeni nko ri(2) tabi ko si kaadi (3) koja lo si ibeere ketalelogun (23);	

21	Ko ojo ti a ko sara kaadi na sile(1)Ko 98 si alafa ibi ti a ko ojo si(2)Ibi ti omo naa gba abere ajestasra de- boya o kan gba abere naa funwon igba die ni – Boya o gba abere naa de oju iwon-Boya ko gba abere naa rara		<table border="1"> <tr> <td></td> <td></td> <td>Ko ojo ti a ko sara kaadi na sile(1)Ko 98 si</td> <td>BCG</td> <td>OPV_n</td> <td>HEP B₀</td> <td>OPV₁</td> <td>Penta₁</td> <td>PCV₁</td> <td>DPT₁</td> <td>HEP B₁</td> <td>OPV₂</td> <td>Penta₂</td> <td>PCV₂</td> <td>DPT₂</td> <td>HEP B₂</td> <td>OPV₃</td> <td>Penta₃</td> <td>PCV₃</td> <td>DPT₃</td> <td>HEP B₃</td> <td>MEASLES</td> <td>Vit. A 1st</td> <td>YF</td> <td>VA S 2nd</td> <td>Zinc</td> <td>Conjugate ACSM</td> <td>Polio booster dose</td> </tr> <tr> <td>Ojo ibi omo</td> <td></td> <td>D a y</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Iwon omo ni igba ti a bi</td> <td></td> <td>M o n t h</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>Y e a r</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>																Ko ojo ti a ko sara kaadi na sile(1)Ko 98 si	BCG	OPV _n	HEP B ₀	OPV ₁	Penta ₁	PCV ₁	DPT ₁	HEP B ₁	OPV ₂	Penta ₂	PCV ₂	DPT ₂	HEP B ₂	OPV ₃	Penta ₃	PCV ₃	DPT ₃	HEP B ₃	MEASLES	Vit. A 1 st	YF	VA S 2 nd	Zinc	Conjugate ACSM	Polio booster dose	Ojo ibi omo		D a y																											Iwon omo ni igba ti a bi		M o n t h																													Y e a r																										
		Ko ojo ti a ko sara kaadi na sile(1)Ko 98 si	BCG	OPV _n	HEP B ₀	OPV ₁	Penta ₁	PCV ₁	DPT ₁	HEP B ₁	OPV ₂	Penta ₂	PCV ₂	DPT ₂	HEP B ₂	OPV ₃	Penta ₃	PCV ₃	DPT ₃	HEP B ₃	MEASLES	Vit. A 1 st	YF	VA S 2 nd	Zinc	Conjugate ACSM	Polio booster dose																																																																																																								
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21a	CHECK 21:		BCG TO Measles all recorded (1) Other specify.....(go to 22)																																																																																																																																
22	Nje omo naa gba abere ajestasra ti a ko ko sile; tabi eyi ti o gba layajo ojo abere ajestasra ti a ko kosile. Ko beeni sile ti oludaun ba daruko irufe abere ajestasra ti a ko kosile		Beeni (1) beere siwaju si; koja lo si ibeere kerinlelogun (25) tabi beeko (2) koja lo si ibeere kerinlelogun (25) Nkomo...98																																																																																																																																
23	Nje omo yi tile ti gba abere ajestasra Kankan ri ti o le dabo bo lowo ilugbadi aisan; pelu abere ti a fun omo naa layajo ojo igbabere ajestasra		Beeni (1) ti o ba je beeni koja lo si ibeere kerinlelogun (24) Beeko (2) ti o ba je beeko koja lo si ibeere karun dinlogun (25). Nkomo (98)																																																																																																																																
23a	Ti o ba je beeko kilode ti omo yi o se gba abere ajestasra kankan (ko gbogbo idi ti won ba so ki o wa koja si ibeere 25)		Mi o ni asiko lati gba omo mi lo (a) Olewu fun omo mi (b) esin mi o gba laye(c) mi o mo igba ti won gba (d) ile mi jinna si ile iwosan(e) iwa awon eleto ilera (f) OS (96)																																																																																																																																
23b	Nje o je didan ki omo yin o gba abere ajestasra Kankan?		Beeni (1) ti o ba je beeni salaye _____ Beeko (2) ti o ba je beeko, salaye _____ ko koja lo si ibeere kerinlelogun (24)																																																																																																																																
23c	Se e le san owo fun abere ajestasra naa ti won o ba fun yin ni ofe mo		Beeni (1) Beeko (2)																																																																																																																																
24	Jowo so fun mi ti omo yi ba ti gba ikankan ninu awon abere ajestasra wonyi:		Beeni (1) Beeko (2) Nko mo... (98)																																																																																																																																
24a	Abere idabo boo mo lowo iko efee ti won maa n gba fun won lapa tabi lejika ti o si ma n ni oju apa. Tabi boya o gba abere ajestasra Kankan nigba ti a ti bi omo naa																																																																																																																																		
24b	Atola ropa-rose ti a ma n to si won lenu		Beeni (1) Beeko (2) ti o ba je beeko koja lo si ibeere kerinlelogun E (24E). Nko mo... (98)																																																																																																																																
24c	Nje o gba abere ropa-rose naa fun laarin ose meji akoko ti a bi omo naa		Ose meji akoko (1) Lehin ose meji akoko (2)																																																																																																																																
24d	Igba melo ni a gba abere ropa-rose yi fun		Iye igba _____																																																																																																																																

24e	Nje omo naa gba abere marun ninu okan (PENTAVALENT injection)	Beeni (1) Beeko (2) ti o ba je beeko koja lo si ibeere kerinlelogun G (24G). Nko mo... (98)	
24f	Igba melo ni a gba abere marun ninu okan (PENTA) fun omom naa	Oye igba _____ Nko mo	
24g	Nje omo naa ba won gba abere itan (DPT) ti a maa n gba fomo nigbakan naa pelu itola ropa-rose	Beeni (1) Beeko (2) ti o ba je beeko koja lo si ibeere kerinlelogun I (24I). Nko mo... (98)	
24h	Igba melo lo gba abere yi	Oye igba _____ Nko mo	
24i	Nje o gba abere HEP B sidi nigbakan naa ti o gba abere itan	Beeni(1) Beeko(2) ti o ba je beeko koja lo si ibeere kerinlelogun K(24k) Nko mo. (98)	
24j	Igba melo lo gba abere yi	Oye igba _____ Nko mo	
24k	Nje omo naa gba abere ti a ma n gba fomo losun mesan lati dena aisan inarun (measles injection)	Beeni(1)Beeko(2)Nko mo	
24l	Nje o gba abere ti a maa n gba fun omo losun mesan ti o ma ndena aisan iba ponju (yellow fever injection)	Beeni(1)Beeko(2)Nko mo	
25	Laarin osun mefa sehin, nje omo naa lo oogun vitamin A iru eleyi (fi iru oogun naa hann fun)	Beeni(1) Beeko(2) Nko mo...98	
25a	Ti o ba je beeni, iye iwon melo ni a lo fun	Iwon kan(1) Iwon meji 2) Nko mo...98	
25b	Bawo lo se ma n ri oogun aropo ounje naa	Ile ise ilera ti ijoba(1) Ajo eleto ilera(2) Ibo miran salaye	
25c	Nje iya omo naa da oogun aropo onje (Vitamin A) mo	Beeni(1) Beeko(2)	
25d	Awon onje ti a ti ma nri Vitamin A melo ni iya omo naa le da mo	Kosi(1) Eyokan(2) Meji(3) Meta(4) Merin(5)	
25e	Nje iya omo na mo ise le to le sele ti a ba lo/je ounje to le fun wa ni Vitamin A	Omo o ni tete dagba(1) Ko ni reran lale(2) Aisan welewele(3) Iku(4) Nko mo... 98	
26	Ni nkan bi ojo meje sehin, nje omo naa lo oogun asara omo lore (sprinkles with iron or any MN powder) bi iru eleyi. Fi iru bee hann fun	Beni(1) Beeko(2) Nko mo... 98	
27	Ni nkan bi ojo meje sehin, nje omo naa lo awon oun amara ji pepe (therapeutic feeds) bi iru eleyi. Fi pali iru bee han fun	Beni(1) Beeko(2) Nko mo... 98	
28	Nje omo naa gba abere ajasara ti a ko ko sile; tabi eyi ti o gba layajo ojo abere ajasara ti a ko kosile. Ko beeni sile ti oludaun ba daruko irufe abere ajasara ti a ko kosile	Beeni (1) beere siwaju si; koja lo si ibeere kerinlelogun (25) tabi beeko (2) koja lo si ibeere kerinlelogun (25) Nkomo...98	
	Nje a lo oogun aran fun omo naa ni nkan bi osun mefa sehin	Beni(1) Beeko(2) Nko mo... 98	
29	Nje omo naa ti yagbe gbuuru ni nkan bi ose meji sehin	Beeni(1)Beeko(2)-ti o ba je beeko koja lo si ibeere ogbon (30)	
29a	Nje eje wa ninu igbe naa	Beeni(1)Beeko(2) Nko mo... 98	
29b	Mo fe mo bi a se fun omo naa lomi to nigba to n yagbe naa(pelu omu)	Die(1) O Kere gan ni(2) Bakan naa(3) O po ju bee(4) A ko fun ni nkankan mu(5) Nko mo... 98	
29c	Nigba ti omo yi yagbe gburu, nje won din ounje re ku	Die(1) O kere gan ni(2) Bakannaa(3) O po ju beelo(4) A ko	

		fun lounje rara (5) A dawo ounje duro(6) Nko mo... 98	
29d	Nje a gba itoni lori bi a ati se le gba itoju fun igbe gbuuru na	Beni(1)Beeko(2) Nko mo... 98	
29e	Nibo lo ti gba itoni ati itoju naa	Ile iwosan ijoba(a) Ile iwosan alagbeka(b) Awon osise eto ilera ti o n kaakiri(d);Ti Aladani-Ile iwosan aladani(d) Odo awon onimo oogun(e) Ibi ti a n ta oogun(f) Dokita aladani(g) Ile iwosan alagbeka(h) Babalawo(j) Ibo miran to yato	
29e(i)	Odo awon onimo oogun/ Ibi ti a n ta oogun, nje a)Nje won se ayewo fun omo naa ni ibi ti a ti gba itoju fun a). Nje o gba itoni lori iru oogun ti a lo fun omo naa b. Boya o tile mo iru oogun pato ti o ye ki o ra ti o si lo si ile oogun lo ra ni	a). Beni(1) Beeko(2) Nko mo... 98 b). Beni(1) Beeko(2) Nko mo... 98 c). Beni(1) Beeko(2) Nko mo... 98	
29f	Ibo ni o ti koko beere fun itoni fun itoju	Ibi akoko _____	
29f(i)	Ojo melo lehin igba ti igbe gbuuru bere lo to beere fun itoni tabi gba itoju(Ti o ba je ojo kannaa ti o bere, ko 00 sile	Iye Ojo _____	
29g	Nje won fun ni eyikeyi mu ninu awon ti a daruko wonyi ni igbakugba lehin igba ti igbe gbuuru naa ti bere- (A)Omi ORS-(B)Omi ti ijoba gba wa niyanju lati maa fun won nile	a). Beni(1) Beeko(2) Nko mo 98 b). Beni(1) Beeko(2) Nko mo 98	
29h	Nje a tun fun omo naa ni nkan (A) Zinc tablets? [B] Zinc syrup) miran mu lati da igbe naa duro	a). Beni(1) Beeko(2) Nko mo 98 b). Beni(1) Beeko(2) Nko mo 98	
29i	Ibo lati ra	Government hosp.a) private hospital b) NGO c) pharmacy d) OS	
29k	Se awon nkan miran tu wa ti a fun omo naa mu lati da igbe naa	Beeni(1) Beeko(2) Nko mo 98	
29l	Kini awon nkan miran ti a fun omo naa mu lati da igbe naa	Pill or syrup antibiotic (A) zinc (B) Antibiotic (C), Non-antibiotic (D), Home remedy/Herbal medicine (E) OS _____ (96)	
30	Nje omo naa ti ni aisan iba ni nkan bin ose meji sehin	Beeni(1) Beeko(2) Koja lo si ibeere kejilelogbon (32); Nko mo	
31	Nigba to saisan iba naa, nje won gba eje re fun ayewo	Beeni(1) Beeko(2) Nko mo	
32	Nje omo naa ti ni aisan iko ni nkan bi ose meji sehin	Beeni(1) Beeko(2) Nko mo	
32a	Nigba ti omo naa ni aisan iko yi, nje eemi re goke si tabi nira si	Beeni(1) Beeko(2) Nko mo	
32b	Nje mimi re to goke tabi mimi pelu agidi na wa lati aya tabi imu didi	Aya nikan(1)Imu nikan(2)Mejeji(3)Ibo miran salaye--- Nko mo	
33a	Mo fe mo bi ati nfun omo na lomi tabi omu to ninu idubule aisan(ti omi ti a fun o ba to, beere siwaju si)	Omi die(1)O kere gan(2)Bakannaa(3)O po si(4)A ko fun ni oun Kankan mu(5)Nko mo	
33b	Nigba ti o wa ninu aisan yi nje won din ounje re ku, tabi iwon ounje ti o nje tele, tabi ju be lo, tabi a ko fun ni onje rara	Onje die(1)O kere gan(2)Bakannaa(3)O po si(4)A ko fun ni ounje rara(5)Nko mo	
33c	Nje o gba itoni tabi itoju fun omo naa lati ibikibi	Beeni(1)Beeko(2)	
33d	Nibo lo ti gba itoni tabi itoju naa. Beere siwaju si	Ile iwosan ijoba(a) Ile iwosan alagbeka(b) Awon osise eto ilera ti o n kaakiri(d);Ti Aladani-Ile iwosan aladani(d) Odo awon onimo oogun(e) Ibi ti a n ta oogun(f) Dokita aladani(g) Ile iwosan alagbeka(h)	

	Babalawo(j) Ibo miran to yato		
33 d(i)	Lati ile itoogun; a). nje won wo oruko b). nje o gba itoni lori iru oogun to ye ko ra c). boya o tile ti mo iru oogun to ye ko ra, ti o si lo ra		a). Beeni(1) Beeko(2) Nko mo... 98 b). Beeni(1) Beeko(2) Nko mo... 98 c). Beeni(1) Beeko(2) Nko mo... 98
33e	Nibo lo ti koko gba itoni tabi itoju		Lo koodi fun ibere yi lati (33d)
33f	Ninu idubule aisan naa, nje omo naa tile lo oogun Kankan rara		Beeni(1) Beeko(2) Nko mo... 98
33g	Iru oogun wo gangan ni omo naa lo(ko oruko oogun to ba daruko sile)	Antimalarial drugs; Sp/fansidar amalar/maloxine (A), Chloroquine- (b), Amodiaquin (C), Quinine (D) ACTs (E) Antibiotic Pill/syrup(F) Injection(G) Aspirin(H) Paracetamol (I) Ibuprofen(K) OS	X, DK (Z)
33h	Bawo lo se pe to ki omo naa to lo oogun ninu idubule aisan naa	Ojo kannaa(1) Ojo keji(2) Ojo keta(3) Ojo kerin(4) Nko mo	
33i	Ojo melo lomo naa fi lo oogun naa(ti o ba lo fun ojo meje tabi ju bee lo, ko sile		Iye Ojo _____ Nko mo... 98
34	Igba ti omo yi yagbe kehin bawo ni a se pale igbe naa mo	Omo naa lo ile igbanse(1) A da sinu ile igbanse(2) A da igbe naa sinu koto(3) A gbe igbe naa sinu ibi ti a n dale nu si(4) A bo mole(5) a fi igbe na sile si gbangba(6) A da sinu odo(7) tabi si ib miran(salaye)	
35	Nje e ti gbo nipa oogun to sese jade ti a n pe ni 'ORS', e le lo fun itoju igbe gburu		Beeni(1)Beeko(2)
36	Nje e gba iwe ojo ibi fun omo naa		Beeni(1)Beeko(2)Nko mo
36a	To ba je bee, nibo ni e ti gba iwe fun	Odo ajo eleto ikaniyan(1)Ijoba ibile(2)Ile iwosan aladani(3)Ibo miran salaye	
36b	Beere lati ri iwe ojo ibi naa		Mo ri(1)Nko ri(2)
37	Ni nkan bi osun mejila sehin, nje idile yi ti gba iranlowo oogun tabi owo fun omo yi, eyi ti a ko san owo fun	Ko si(1)Latodo Ijoba(2)Latodo Aladani(3)Latodo awon Elesin(5)Latodo awon ti n saanu(6)Latodo Ilu(7)Tabiibomiran-salaye	
38	Ona miran wo lo n gba lati toju omo yi ti o ba saisan		Ra oogun fun ra mi(1)Isegun ibile(2)Ona miran-salaye
39	Nje omo yi ti wa ni idubule aisan fun igba pipe ri		Beeni(1) Beeko(2) to ba je beeko skip to 40
39a	Bawo ni aisan naa se pe to		Osun kan(1)Ko to osun meji(2)O ju osun meji(3)
40	Nje eleito ilera Kankan ti so fun o ri nipa bi o se le dana oyun nini?		Beeni(1) Beeko(2)
40a	Nje o ti gbogbo tabi se o ti ri ona kanknan ti a le fi dana oyun nini?	Beeni(1) Beeko(2) to ba je beeni bawo ni a) TV b)radio c) newspaper / magazine d) town crier e) posters OS	
40b	Nje o n se oun Kankan tabi lo oogun Kankan lowolowo lati lee dena oyun nini		Beeni(1)Beeko(2)
40c	Nje awon osise eleto ilera ti salaye ona ti a le gba dena oyun fun e ri		Beeni(1)Beeko(2)
40d	Ona wo lo n gba lati dena oyun nini, kale mo won	Te loda (1) IUD(2) Abere(3) Yiyi ile omo pada(4) Lili oogun(5) Roba idaabo bo(6) Fuke-fuke(7) Sisa fun ibalopo(8) Ona igbalode miran(9) Ona ibile miran(10)	
40e	Nibo lo ti ri ona igbalode yi gba gbehin		Ile iwosan ijoba(a) Ile iwosan alagbeka(b) Awon osise eto ilera ti o n kaakiri(c),Ile iwosan aladani(d) Odo awon onimo oogun(e) Ibi ti a n ta oogun(f) Ibo miran to yato

APA KEJE-AGBEYEWO BI O SE NJE ONJE TI N SARA LOORE SI

S/N	IWON	IYA	OMO
1	Imo Ako tabi Abo		Okunrin(1)Obirin(2)
2	Ojo ori	Odun	Osun ati Ojo ti a bi
3	Iwon-wiwuwo	kg	Kg
4	Iwon-Giga	M	Cm
5	Won iwo re ti o ba sun sile tabi ti o ba duro		Ni idubule(1)Ni iduro(2)Nko won
6	Iwon aarin apa		
7	Iwon omo nigba ti a bii/ tabi iwon ti iya omo lero pe o won	Kg_____ Nko mo__	Ti ko ba mo, wo boya omo natobi tabi o kere loju
8	Bi a se bi omo naa		Bibi were(1)Bibi pelu ise abe(2)
9	Nje o loyun	Beeni(1)Beeko(2)	
10	Nje omo naa wa ni ihoho	Beeni(1)Beeko(2)	

E seun fun ifowosowopo ati akoko yin.

APPENDIX III

Focus Group Discussion Guide


Introduction


The moderator introduces herself, the topic of discussion and the importance of the discussion. Assurance of confidentiality would be expressed to the participants.

Questions to be discussed:

1. Have you heard about child survival? Probe: could you expatiate more?
2. What do you understand by child survival interventions?
3. List the child survival intervention that you know
4. List the child survival intervention that your under-five child received: probe further are there other intervention that your child has been exposed to
5. Could you tell me the limitation of assessing these interventions in your community?
Probe: Is this the only one? Could you tell me other limitations?
6. Could you tell me the limitation to the uptake of these interventions?
Probe: Is this the only one? Could you tell me other limitations?
7. What do you think are the benefits of these interventions
Probe: is there other benefits apart from the once you have stated.
8. Could you tell me what you think (recommendation) will improve the uptake of these interventions for under-five children in our communities

APPENDIX IV ETHICAL CLEARANCE

 **INSTITUTE FOR ADVANCED MEDICAL RESEARCH AND TRAINING (IAMRAT)**
College of Medicine, University of Ibadan, Ibadan, Nigeria.

 Director: **Prof. Catherine O. Falade**, MBBS (Ib), M.Sc, FMCP, FWACP
Tel: 0803 326 4593, 0802 360 9151
e-mail: cfalade@comui.edu.ng lillyfunke@yahoo.com

UI/UCH EC Registration Number: **NHREC/05/01/2008a**

NOTICE OF FULL APPROVAL AFTER FULL COMMITTEE REVIEW

Re: Determinants of and Effect of Behavioural Change Communication (BCC) on child Survival among under-five children in South-Western, Nigeria

UI/UCH Ethics Committee assigned number: **UI/EC/15/0427**


Name of Principal Investigator: **Bamisaye O. Bukola**
Address of Principal Investigator: Department of Human Nutrition,
College of Medicine,
University of Ibadan, Ibadan

Date of receipt of valid application: **12/11/2015**
Date of meeting when final determination on ethical approval was made: **N/A**

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

This approval dates from **19/02/2016 to 18/02/2017**. If there is delay in starting the research, please inform the UI/UCH Ethics Committee so that the dates of approval can be adjusted accordingly. Note that no participant accrual or activity related to this research may be conducted outside of these dates. *All informed consent forms used in this study must carry the UI/UCH EC assigned number and duration of UI/UCH EC approval of the study.* It is expected that you submit your annual report as well as an annual request for the project renewal to the UI/UCH EC early in order to obtain renewal of your approval to avoid disruption of your research.

The National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the Code including ensuring that all adverse events are reported promptly to the UI/UCH EC. No changes are permitted in the research without prior approval by the UI/UCH EC except in circumstances outlined in the Code. The UI/UCH EC reserves the right to conduct compliance visit to your research site without previous notification.



Professor Catherine O. Falade
Director, IAMRAT
Chairperson, UI/UCH Ethics Committee
E-mail: uiuchec@gmail.com

Research Units • Genetics & Bioethics • Malaria • Environmental Sciences • Epidemiology Research & Service
• Behavioural & Social Sciences • Pharmaceutical Sciences • Cancer Research & Services • HIV/AIDS

APPENDIX V
Field Pictures



Mothers answering questions at baseline



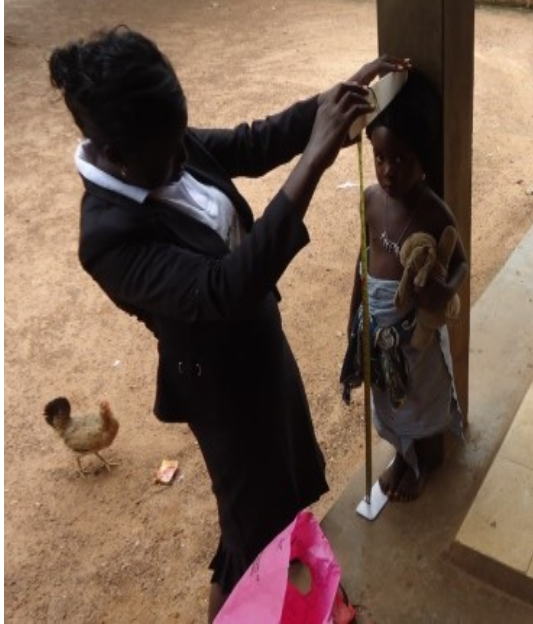
Training Session for Research Assistants



Mothers undergoing BCC sessions



Administering post-intervention questionnaire to mothers



Measuring

Weight, Height and Length respectively



Measuring Mid Upper Arm Circumference



Mothers receiving long lasting insecticide treated nets

“I am afraid of the interventions being given, I don't want my son to be given an expired drug/vaccine or even be given an over dose”...



“My belief does not allow me to expose my child to these interventions because we don't use the Health Center”...

Focus Group sessions

Some mothers are afraid of over dose, for instance I didn't take my last child for measles vaccination because she had already received several interventions and I felt that it will be too much for her to bear



"I don't have money to pay in Health Centre for my child to receive the intervention that is why I sometimes kept my child away from it and use traditional medicine instead" ...



"I did not want to expose my child to the risk of paralysis because my younger sister became paralysed after receiving measles vaccination and she has been like that till date, so I have to protect my child from this" ...

Focus Group sessions continued

APPENDIX VI CONTENT OF PICTORIAL FLIP CHARTS AND CARDS USED

What do you need to do to ensure the safety of you and your baby during and after pregnancy?



1. Every pregnancy is special. All pregnant women need at least four prenatal care visits to help ensure a safe and healthy pregnancy.
2. The risks associated with childbearing for the mother and her baby can be greatly reduced if a woman is healthy and well-nourished before becoming pregnant.
3. Every pregnant woman must be assisted at childbirth by skilled birth attendant and have timely access to specialized care if complications occur.
4. Post-natal care for the mother and child reduces the risk of complications.
5. Smoking, alcohol, drugs, poisons and pollutants are harmful to pregnant women, the developing fetus, babies and young children.

Why is it important for your child to be immunised?



1. Immunisation is urgent. Every child should complete the recommended series of immunisations.
2. Early protection is critical; the immunisations in the first two years are particularly important.
3. A child who is not immunised is more likely to become sick, permanently disabled or undernourished, and could possibly die.
4. It is safe to immunise a child who has a minor illness or a disability or is malnourished.
5. A new syringe must be used for every person being immunised.



**Don't Forget,
Vaccination
Your baby must get!**

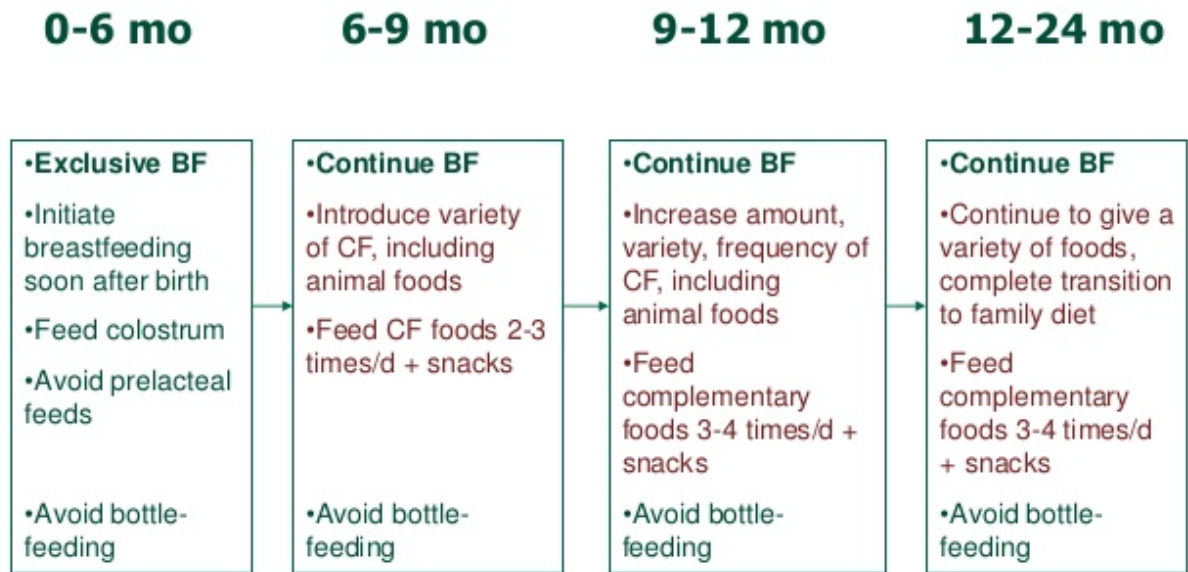
Adapted from WHO (2014)

Is it important for you to exclusively breastfeed your child for the first six months of life?



Is breastmilk only appropriate for your child after six months of age?

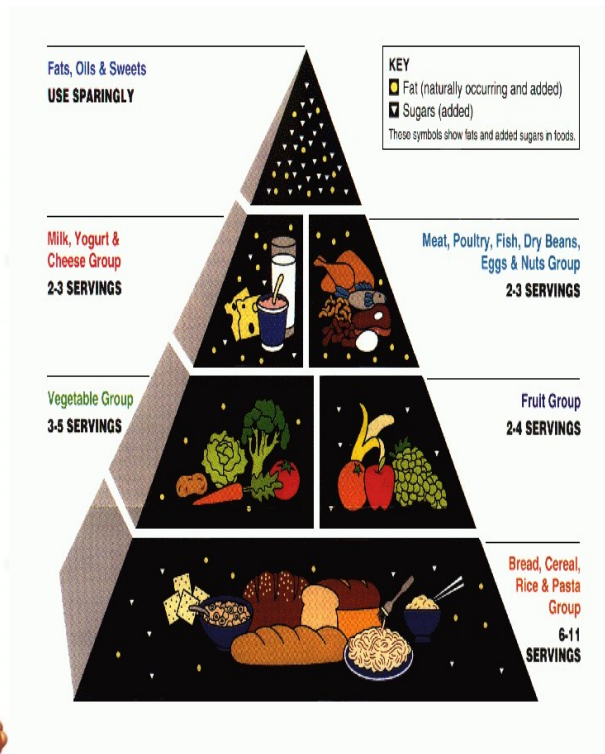
The Continuum of Infant and Child Feeding



What do you think happened to this child? Why is the leg in this picture swollen?



What do you think should constitute you and your child's daily diet?



HYGIENE:

Let's Wash Our Hands!

Whooshy washy!
Wet our hands
Under running water
Add some soap and
Rub them hard
Don't miss any part!
Between our fingers
Under the nails
Kil germs without fail
Front and back
And round the wrist
No germs will be missed!
They may hide
But we shall seek
So we will not fall sick!
Splishy splashy
Bye bye germs
Down the drain they squirm
With clean towels
We dry our hands
Now let's show our friends!

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Remember to wash our hands:

After using
the toilet

After sneezing
or coughing

After playing
with pets

After sports or
playing outside

Before eating



Keep your environments clean!

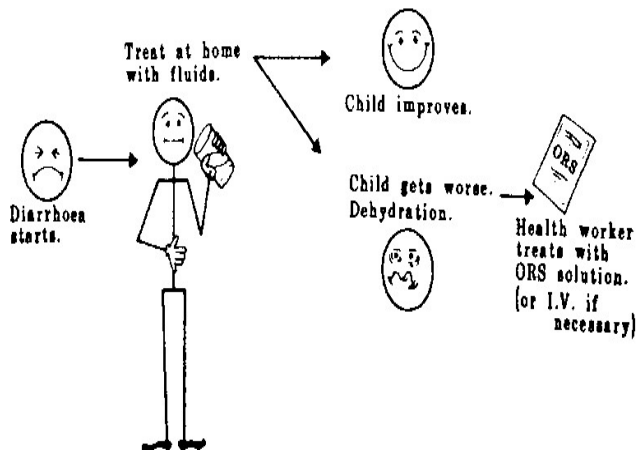
- All family members, including children, need to wash their hands thoroughly with soap and water after any contact with faeces, before touching or preparing food, and before feeding children.
- Safe disposal of all household refuse helps to prevent illness.
- All water that people drink and use should come from a safe source or be purified.
- Food, utensils and preparation surfaces should be kept clean and away from animals.
- Food should be stored in covered containers.

How do you prevent and treat diarrhoea?



- Keep your hands clean always
- Wash fruits and vegetables
- Refrigerate and always cover food
- Eat well-cooked food
- EBF for the first six months of life and adequate CBF after six months can reduce the risks associated with diarrhoea.
- Vaccination, vitamin A and zinc supplementation can reduce the risk of diarrhoea.

A child with diarrhoea should receive oral rehydration salts (ORS) solution and a daily zinc supplement for 10–14 days



DANGER SIGNS: Refer immediately if-

- Child did not improve within 3 days
- There is increase in the number of stools
- Develops very watery or bloody stools
- Severe vomiting
- Marked reduction in urine output
- Develops high grade fever
- Decrease in alertness or consciousness

WHEN YOU OR YOUR CHILD EXPERIENCE ANY OR SOME OF THESE (a COUGH, COLDS,AND MORE SERIOUS ILLNESSES)

WHAT WILL YOU DO?



1. You can help prevent pneumonia by making sure babies are exclusively breastfed for the first six months and that all children are well nourished and fully immunised.
2. Coughs may be signs of a serious problem take child to the nearest health facilities.
3. A child who is breathing rapidly or with difficulty should be referred to a health facility
4. A child with a cough or cold should be kept warm and encouraged to eat and drink as much as possible.

What is this?



What does it cause?



Why are they sleeping under the net?

In your own view is this important?

Malaria is transmitted through the bites of some mosquitoes.

A child with fever should be taking to the nearest health facility for prompt and appropriate treatment.

Sleeping under an insecticide-treated mosquito net is the best way to prevent mosquito bites.