KNOWLEDGE, PERCEPTION, PRACTICES AND SOURCES OF INFORMATION ON IMMUNIZATION AMONG MOTHERS/CAREGIVERS OF CHILDREN AGED 12-23MONTHS IN KADUNA STATE, NIGERIA

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DECLARATION

I declare that the work in the dissertation entitled knowledge, perception and sources of information on routine immunization among mothers of children aged 12-23 months in Kaduna State, 2015 was carried out by me in the Department of Community Medicine under the supervision of Dr. S.H. Idris. The information from the literature has been duly acknowledged in the text and a list of references provided. No part of this dissertation was previously presented for award of degree or diploma nor has it been submitted elsewhere for publication.

_____ _____

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CERTIFICATION

This thesis titled **"KNOWLEDGE PERCEPTION AND SOURCES TO INFORMATION ON ROUTINE IMMUNIZATION AMONG MOTHERS OF CHILDREN AGED 12-23 MONTHS IN KADUNA STATE"** by Taiwo, Lydia Abidemi meets regulations governing the award of the degree of Masters in Public Health of Ahmadu Bello University Zaria, and is Approved for its contribution to knowledge and literary presentation.

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DEDICATION

This work is dedicated to all the children who have died or sustained serious disability due to vaccine preventable diseases.

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I want to humbly thank God almighty for giving me the opportunity and grace to successfully complete this project.

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LIST OF ACRONYMS

ANC	Antenatal Care
BCG	Bacillus Calmette--Guérin (vaccine)
DEFF	Design Effect
DPT	Diphtheria-Pertusis-Tetanus (vaccine)
EPI	Expanded Program on Immunization
FIC	Fully Immunized Child
GPEI	Global Polio Eradication Initiates
HBV	Hepatitis B vaccine
Hib	Hemophilus influenza type B
HC	Health Centre
IPDs	Immunization plus Days
MMR	Measles Mumps and Rubella
NFELTP	Nigeria Field Epidemiology and Laboratory Training Program
NGO	Non Governmental Organization
NIDs	National Immunization Days
NPHCDA	National Primary Health Care Development Agency
OPV	Oral Polio Vaccine
PPS	Probability Proportional to Size (Sampling)
RI	Routine Immunization
SIA	Supplementary Immunization Activities
TT	Tetanus Toxoid
VPD	Vaccine Preventable Diseases
WHO	World Health Organization

SUMMARY

Immunization is one of the safest and most effective interventions to prevent disease and early child death. Although, about three quarters of the world's child population is reached with the required vaccines, only half of the children in Sub-Saharan Africa get access to basic immunization. In Nigeria, only 10% of children in the North West geographical region are fully immunized compared to 52% in the South East and South West regions. Immunity gap created by this low immunization coverage in Northern Nigeria favors the emergence and transmission of some vaccine preventable diseases (VPDs) especially measles and polio. Knowledge and perception of mothers/caregivers regarding VPDs favour demand and utilization of immunization services. This study was thus, carried out to assess the knowledge, perception and practices of mothers/caregivers on routine immunization in children aged 12-23 months in Kaduna State, determine the sources of information on routine immunization and other factors associated with uptake of routine immunization among mothers/caregivers of children aged 12-23 months in Kaduna State.

A cross-sectional descriptive study was conducted using multistage sampling technique; 379 eligible mothers/caregivers were recruited. Data collection was done using semi structured interviewer-administered questionnaire to obtain information on socio-demographics, knowledge, perception and practices of mothers/caregivers towards routine immunization and sources of information on routine immunization. Data were analyzed using Epi info™ version 7.

A total of 379 respondents were interviewed. Of these, majority (64.67%) practiced Islam , less than half (41.95%) completed Secondary school while about one-quarter (25.07%) were aged 30-34 years. . In addition, most (64.91%) were unemployed, 92.25% were married while 52.82% were from rural settlements. Among the children whose mothers/caregivers were interviewed,

majority (43.01%) were between aged 16-19months old, 53.30% were females while most (62.80%) fell within the birth order of 2^{nd} -5^{th} child . Only 59 (15.6%) of these children were found to be fully immunized, evidenced by vaccination card history. Furthermore, among the respondents, majority (64.4%) had unsatisfactory knowledge while 55.36% and 54.0% exhibited poor perception and bad practices respectively, regarding routine immunization. Commonest source of information was radio (61.61%). Educational status and good perception of mothers were found to be associated with getting information on routine immunization within 12months prior to this study while Polygamous family setting, unsatisfactory knowledge and bad practices of mothers were independently associated with lack of information on routine immunization.

In conclusion the research showed that mother's educational status, family setting, knowledge, perception and practices about immunization are important factors that influence access to routine immunization information which are ultimately predictors of full child immunization. It is therefore recommended that Kaduna state government should create convenient adult education classes to improve educational status of mothers and be committed to girl-child education. The state should intensify sensitization of mothers/caregivers on routine immunization using radio and television jingles through the Ministry of information to improve their knowledge and utilization of routine immunization service.

Key words: Routine Immunization, information, mothers/caregivers

CHAPTER ONE: INTRODUCTION

1.1 Background

Immunization is one of the safest and most effective interventions to prevent disease and early child death. Although, about three quarters of the world's child population is reached with the required vaccines, only half of the children in Sub-Saharan Africa get access to basic immunization. In recent years, many countries have employed a growing range of strategies to increase both the provision and utilization of immunization services. These experiences are in consonant with the Global Immunization Vision and Strategy (GIVS) of "using a combination of approaches to reach everyone targeted for immunization".[1]

A substantial number of children worldwide do not complete immunization schedules because neither health services nor conventional communication mechanisms regularly reach their communities. In some communities, low immunization rates are associated with families living a long distance from health services, having little access or exposure to large-scale or local media, and low doctor- and nurse-patient ratios (e.g. slum-dwellers in the Philippines and South Africa, nomadic populations in Sub-Saharan Africa, and internal migrants in Brazil, Cameroon, and Mozambique). Underserved communities have consistently shown low immunization coverage.[6]Innovative outreach strategies are needed to particularly target children who are excluded or beyond the reach of immunization services.

Similarly, anti-vaccination information and/or refusal to get children immunized is not new in the world. Historically, populations have rejected immunization due to concerns about vaccine safety as well as political, cultural, and religious reasons.[7]Today, trust and acceptance of immunization faces two new formidable challenges. Firstly, a global, fast-paced communication environment makes it possible for negative publicity and anti-immunization positions to be disseminated quickly worldwide. Localized opposition (e.g., polio campaigns in India and Nigeria), negative publicity surrounding vaccine safety (e.g., MMR vaccination

in the UK), and suspected or real adverse events following immunization are more likely to attract wide media coverage, and spread through the Internet.[8,9] Secondly, increased democratization promotes debates about individual and community rights and choice. Today, democratization offers an environment more conducive to the emergence of challenges to government-mandated programs such as immunization. In a growing "rights" environment in both the developed and developing world, national programs like immunization are more vulnerable to being questioned.[6]

There is an ever widened gap in access to vaccines between developed and developing countries in the past decades. More vaccines have become available, but most developing countries cannot afford the newer vaccines, lack well-functioning systems to deliver them, and have inadequate surveillance systems or study data to determine the burden of disease to motivate decision-makers to adequately fund them. A number of vaccines such as hepatitis B, yellow fever, and haemophilus influenza type B (Hib) are under-utilized due to inadequate funding from Ministries of Health, overstretched health systems, and weak demand from health providers and caregivers[6] (who lack sufficient knowledge about the efficacy of specific vaccines and are unaware of the burden of vaccine-preventable diseases or the availability of vaccines).

The induction of immunity by applying vaccine in children is among the most cost-effective health interventions to reduce child mortality, morbidity, and disability in the world.[10] This is achieved through a routine vaccination schedule for children in Nigeria which are given starting from birth, and are being completed before one year of life by all children as it obtained elsewhere.[11] BCG and OPV0 are administered at birth, while three doses of OPV and pentavalent vaccines (which protect against diphtheria, pertussis, tetanus, hepatitis B and Haemophilus influenzae type B disease) are given at interval of four-week duration; at 6, 10

and 14 weeks, and measles vaccine is given at the age of nine months.[12]Nigerian government introduced pentavalent vaccine into her routine immunization schedule recently (2012).

Nigeria like many countries in Africa is making efforts to strengthen its health system especially routine immunization so as to reduce disease burden from vaccine preventable diseases (VPDs). Such efforts include provision of the vaccines and personnel through the NPHCDA, private or NGO providers', community based participation and the media.

1.2 Problem Statement

Only 10% of children in the North West Nigeria are fully immunized, compared to 52% of children in the South East and South regions despite the numerous vaccination campaigns in place[18].This may be due to social and cultural practices that restrict most women from obtaining basic information on immunization in the North.[25]The low routine immunization coverage in the study area has favored the transmission of wild polio virus with high cases of poliomyelitis. Immunity gap by this low immunization coverage favors the emergence and transmission of some vaccine preventable diseases like measles.[18]

According to the WHO, the persistence of vaccine-preventable diseases in Nigeria can largely be attributed to the under-utilization of available vaccines,[19] and knowledge gaps by the mothers/caregivers which underscores low compliance with vaccination schedules; [many parents are not fully aware of the benefits of vaccination and as a result do not immunize their children against vaccine preventable diseases]. Also, relative distance of communities to the health centers may not allow complete immunization schedules to take place because neither health services nor conventional communication mechanisms regularly reach these communities; which is the case in nomadic communities in Nigeria.

The above scenario is the situation found in Kaduna State, where the inability of the nomadic communities to be reached and participate fully in the RI and SIAs was the reason advanced

by the Kaduna State Government for the outbreak of poliovirus as witnessed in 2012. The cases were reported in Birnin Gwari, Ikara, Igabi, Kubau and Zaria Local Governments.[20]Similarly; rejection of immunization due to concerns about vaccine safety as well as political, cultural, and religious reasons have also been identified to limit effective utilization of routine immunization.

1.3 Justification for the Research

Different studies have shown that knowledge gaps underlie low compliance with vaccination schedules.[2,3,4,5] Mothers/Caregivers are less likely to complete immunization schedules if they are poorly informed about the need for immunization, logistics (time, date, and place of vaccination), and the appropriate series of vaccines to be followed. Although knowledge in itself is insufficient to create demand, poor knowledge about the need for vaccination and when the next vaccination is due is a good indicator of poor compliance.[6]

Tracking, evaluating and assessing the type and quality of information received by mothers would provide a vital tool for understanding routine immunization gaps in the study area.

Thus, it is important to conduct this study to examine the associations between knowledge, perception and the information mothers/care givers receive aside their socio-demographic factors because when up-to-date, complete, and scientifically valid information about vaccines is available, parents can make informed decisions. For example, they need to have access to accurate evidence-based information so that they understand the risks of non vaccination, the importance of community immunity, and the actual risks of complications.[23] Without this information, many mothers may develop a false sense of security and regard immunizations as unimportant.

1.4 Research Questions

1. What are the sources of information on routine immunization in Kaduna State?

2. What is the level of immunization coverage in the study area?

3. What are the socio-demographic factors that influence the acceptance of immunization activities by mothers/caregivers?

1.5 Objectives

1.5.1 General Objective

To determine mothers/caregivers knowledge, perception and sources of information on routine immunization in Kaduna state

1.5.2 Specific objectives

1. To assess the knowledge and perception of mothers/caregivers on vaccine preventable diseases in children aged 12-23 months in the Kaduna State
2. To determine the sources of information on routine immunization among mothers/caregivers of children aged 12-23months in the study area
3. To determine the mothers/caregivers immunization practices based on available information on immunization
4. To assess factors that influence the uptake of routine immunization by mothers in Kaduna State

1.6 Scope of the Study

This study was set out to find the knowledge, perception and sources of information on routine immunization in Kaduna state and limited itself to studying mothers/caregivers whose children were within the age 12-23 months in Kaduna State

1.7 Definition of Terms

Access: the opportunity or right to experience or make use of something.

Cluster survey: A survey in which, after the population under study has been subdivided into clusters, some subjects from selected clusters are observed.

Coverage level: Percentage of fully immunized children with valid doses by one year of age.

Design effect: A measure of variability due to selection of survey subjects by any method other than simple random sampling.

Drop–out rate: Percentage difference in coverage between BCG and measles (card or card and history).

EPI service utilization: The extent to which immunization services provided by health workers is being patronized by mothers and their children.

Fully immunized child: A child who has received all the prescribed vaccine doses considered to protect the child from vaccine preventable diseases.

Immunization: A process whereby a vaccine is injected or introduced into a child to confer immunity to the child against a specific disease.

Immunization centre: A place where mothers and their children attend immunization session.

Immunization cluster sampling technique: A household survey done in a number of clusters of a predetermined number of children to assess immunization services.

Immunization strategy: A well defined method employed by health workers to meet mothers and their children for immunization services to be executed.

Infant immunization coverage: The percentage of children under one year (12 months old) who have been vaccinated.

Information: It is definite knowledge acquired or supplied about something or somebody or the collected facts and data about a specific subject.

Knowledge: A familiarity, awareness or understanding of someone or something, such as facts, information, description or skills which is acquired through experience, education or learning.

Partially immunized child: Is a child who has missed at least one dose of any of the prescribed antigens.

Practice: The actual application or use of an idea, belief or method as opposed to theories about such application of use.

Perception: A way of regarding, understanding or interpreting something; a mental impression.

Reasons for failure to immunize: Reasons why children and mothers do not come or attend or return for immunization session.

Utilization: To make use of something, or find a practical or effective use for something

CHAPTER TWO: LITERATURE REVIEW

2.1 History of Immunization

The use of immunization to prevent disease predated the knowledge of both infection and immunology. In about 600 BC, Chinese were accustomed to using smallpox material inoculated through the nostril to prevent the disease in a process, known as "variolation" which took a variety of forms. Inoculation of healthy people with a tiny amount of material from smallpox sores was done in many Asian countries at that time. And the knowledge about disease was vague. However, Hippocrates, the father of Medicine was able to described mumps, diphtheria, epidemic jaundice, and other conditions, in 400 BC.[27]

In 1798, Edward Jenner published his work on the development of a vaccination that would protect against smallpox. Two years earlier, in 1796, he had first speculated that protection from smallpox disease could be obtained through inoculation with a related virus, vaccinia or cowpox. He tested his theory by inoculating eight-year-old James Phipps with cowpox pustule liquid recovered from the hand of a milkmaid, Sarah Nelmes in a process known as "vaccinia". The boy caught cowpox. However, when the boy was exposed to smallpox eight weeks later by Jenner, the child did not contract the disease.[28]

During the nineteenth century, there were many theories of diseases, but Louis Pasteur was the first to propose "The Germ Theory of Disease" in 1877. He went ahead to create the first live attenuated bacterial vaccine (chicken cholera) in 1879. Robert Koch in 1882 identified the tubercle bacillus as the cause of tuberculosis, subsequently called Koch's bacillus. The diphtheria toxin was discovered by Emile Roux in 1888.[27] Passive serum therapies were developed through the scientific contributions of many, including Emil Von Behring who developed the first effective therapeutic serum against diphtheria and Paul Ehrlich who developed enrichment and standardization protocol, which allowed for an exact determination of quality of the diphtheria antitoxins. Tetanus toxoid was introduced in 1914

following the development of an effective therapeutic serum against tetanus by Emil Von Behring and Shibasaburo Kitasato.[27]

In a related development, in 1927 Bacille Calmette-Guerin (BCG) vaccine was first used in newborns, having been developed by Albert Calmette and Camille Guéérin in 1921. BCG (live-attenuated *Mycobacterium bovis*) represented the only vaccine against tuberculosis.[22]

Goodpasture's demonstrated in 1931 how virus can grow in cell culture which was further developed and shown to be able to grow virus in the medium, thus paving the way for the subsequent production of viral vaccines.[22] Oral polio vaccine types 1 and 2, developed by Albert Sabin and grown in monkey kidney cell culture were licensed for use in the U.S in 1961. In 1960, Sabin introduced the monovalent live oral poliovirus vaccine followed by its trivalent type in 1963[29]. This is the most commonly used polio vaccine today. Live attenuated measles virus vaccine was also licensed in the U.S in 1965. The recommended age for routine administration was changed from 9 to 12 months of age.[27]

Following the tremendous success associated with vaccine development and especially the successful eradication of smallpox; in 1974 the Expanded Program on Immunization (EPI) was created by WHO, in a bid to provide vaccination to most of the world's population before the first birthday.[30] The six diseases chosen to be tackled under this initiative were tuberculosis, diphtheria, tetanus, pertussis, polio and measles. It was not until 1988 that the WHO recommended that yellow fever vaccine be added to the national immunization programme of those countries where it is endemic. Later in 1992 the World Health Assembly recommended hepatitis B vaccination for all infants.[31]

2.2 Benefits of Immunization

Global immunization coverage has never been higher. More than 100 million children are immunized each year against tuberculosis, polio, measles, diphtheria, tetanus, pertussis,

hepatitis B, Haemophilus influenzae type B, and, in some countries, yellow fever. These vaccines save an estimated 2.5 million lives each year. The benefits of vaccines go beyond protecting children from disease. One recent study in the Philippines showed that children who received vaccines were not just healthier throughout childhood but also scored significantly higher on language, math, and verbal reasoning tests.[32]

This must have been the reason why Nigeria conducted an important mass campaign in late 2011 to deliver a new meningitis vaccine. Similarly, in 2012, Nigeria began a three-year, phased rollout of the pentavalent vaccine, which protects against diphtheria, tetanus, pertussis, hepatitis B, and Haemophilus influenza b. Introduction of the pneumococcal and rotavirus vaccines are expected to begin in 2014 and 2015 respectively.

Efforts to eradicate polio are at an all-time high as the country fights to escape being one of the three polio endemic countries in the world. Beyond reducing child mortality, research shows that increasing vaccine access will have a positive impact on Nigeria's economy.

Researchers at the Johns Hopkins Bloomberg School of Public Health International Vaccine Access Center estimate that achieving 90% coverage with vaccines against five diseases (Hib, pneumococcal, measles, pertussis, rotavirus) would save more than 600,000 lives and avert U.S. $17 billion in economic losses for Nigeria over the next ten years, lifting millions out of the vicious cycle of illness and poverty. Nearly 200 countries around the globe have endorsed a shared vision—known as the Decade of Vaccines—to extend the benefits of vaccines to every person by 2020 and thereby save more than 20 million lives. The eradication of polio is an early and important priority. This international collaboration has generated the Global Vaccine Action Plan (GVAP), a roadmap for extending the delivery of a basic package of vaccines, making vaccines that are available in richer countries accessible in the developing world, and supporting vaccine research and development.[33]

2.3 National Program on Immunization (NPI) in Nigeria

The National Program on Immunization (NPI) is one of the components of Child Survival Programs. NPI was designed to ensure that vaccination facilities are distributed to wider community coverage, using various means such as health education, provision of vehicles, the cold chain technique etc. It was introduced in Nigeria in 1979. It was initially known and called Expanded Program on Immunization (EPI) based on its adoption from WHO. To give it a national outlook and show Federal Government commitment, the Federal Govt. established an agency called NPI under Decree 12 in August 1997. This is to effectively control the occurrence of all vaccine preventable diseases through immunization and provision of vaccine and other consumables. The focus is on prevention, control and eradication of the following vaccine preventable disease in Nigeria i.e. tuberculosis, measles, diphtheria, pertussis, neonatal tetanus, cerebrospinal meningitis, yellow fever and polio. These were targeted through immunization service delivery and this was done by administration of vaccine to susceptible target. NPI aim the following group of people: Children of age 0-11months, all pregnant women and women of reproducing age group.[34]

The World Health Assembly launched the Global Polio Eradication Initiative in 1988 and declared the year 2000 as the target year by which to achieve poliomyelitis eradication. After aggressive mass immunization backed up by effective routine immunization, cases of poliomyelitis reduced from 350 000 in 165 countries in 1988 to 355 occurring mainly in three countries — Nigeria, Afghanistan, and Pakistan — by 2013. Nigeria in line with this global concern enacted a policy towards the eradication of polio, meningitis and others through SIAs/Catch-up campaigns (IPDs, LIDs, Child Health Week etc) which is usually planned and regularly carried out based on needs and result of coverage surveys, to improve routine immunization coverage and control out-break situations e.g. Meningitis, measles, and yellow fever. Similarly, supplemental TT activities for women of childbearing age, Polio Eradication

and Measles elimination activities are planned and carried out annually until the goals/objectives are met.[13]NPI has a sole responsibility of supervising and enhancing routine and supplemental immunization activities in Nigeria. This is done periodically in many states in the form of National Immunization days (NIDs), local immunization days (LIDs), immunization plus days (IPDs) and child health week all targeted at boosting immunization coverage and mopping up and reaching every child (including those children in hard to reach areas) irrespective of their immunization status.

Nigeria is signatory to the declaration on the survival, protection and development of children, which was articulated at the 49th World Health Assembly in 1988. Following the Federal Government Health Sector Reform, NPI was merged with the National Primary Health Care Development Agency (NPHCDA) in May, 2007. In Nigeria, all three levels of government (Federal, State and Local) are important partners, committed to the formulation of strategies and support for the implementation of an effective immunization program. To target national interests and priorities, the government provides vaccines and immunization services free to all eligible populations, through functional PHC centers government and private health facilities. Government ensures the provision of vaccines and the use of a national immunization schedule in order to attain optimal protection against childhood killer diseases and other vaccine preventable diseases for:

i. Eligible children 0–11 months.
ii. Eligible children 0-59 months.
iii. Women of child bearing age 15–49 years.[13]

2.4 Immunization schedule in Nigeria

One of the principles in the administration of NPI vaccines to children is that vaccine protection must be provided before they attain ”the high risk age” for the diseases and this must be done to as many children as possible (95%) to achieve herd immunity. NPI policy is

based on the epidemiological pattern of the diseases in the country, the availability of vaccines and the operational capacity of the National Program on immunization[35]. The schedule is such that a child receives one dose of Bacille Calmette-Guerin (BCG), Oral Polio Vaccine (OPV0), Hepatitis B Vaccine (HepB0) at birth; OPV1, Pentavalent1, Pneumococcal Conjugate Vaccine (PCV1), HBV1, IPV at 6 weeks; OPV2, Pentavalent2, PCV2, HBV2 at 10 weeks; OPV3, Pentavalent3, PCV3, HBV3 at 14 weeks, Measles and Yellow Fever at 9 months and lastly Vitamin A at 15 months.

2.5 Factors Affecting Full Child Immunization

2.5.1 Mothers' characteristics

Several factors are known to influence immunization of children both in the developed and developing countries**.**

In a study conducted in Nigeria, the relationship between childhood immunization and maternal education was significant and indicated that children whose mothers have primary education are less likely to be immunized than those whose mothers do not have any education.[36] Household socio-economic status was found to be strongly correlated with child immunization. The data however showed that poor households were significantly less likely to immunize their children compared with wealthier households and furthermore, living in a household headed by a woman constitutes a significant disadvantage for child immunization.[36]

Similarly, another study noted that 20% of mothers interviewed in Iji Nike in Enugu East Local Government Area (LGA) did not immunize their children against measles mainly due to the mothers not understanding the immunization schedule. Fifty percent (50%) of these mothers had either primary education or no formal education at all while only 6% had post secondary education.[79] Mother's characteristics have a profound influence and are the most known determinant factors of full child immunization. Different studies have shown that

mothers with lowest education and unemployed were less likely to complete a child immunization.[37,38] Education empowers a woman to access relevant health services, interact effectively and assimilate information relating to prenatal care, childhood immunizations and nutritional needs.[39]

2.5.2 Child Characteristics

Child characteristics like sex of child, birth order of the child, place of delivery and antenatal care (ANC) follow up could influence immunization coverage among children were identified to play a major role in full immunization of children.[46] In a study conducted in 2004 to identify factors that determine the receipt of full series of diphtheria–pertussis–tetanus vaccines (DPT3) among children aged 12-35 months in the Northern part of Nigeria; it was found out that fixed effects of the child's characteristics were statistically dependent on child's characteristics.[60]

2.5.3 Societal cultural background

Vaccination uptake is considered to be highly culturally sensitive, influenced by local perception on childhood diseases and decisional processes in households[45]. While some authors in African communities[42-44], attribute low achievement of immunization coverage to cultural discrepancies, some etiological consideration regarding preventable disease have even been identified as "cultural prejudices".[46]

2.5.4 Religious and political influences

Religion is a significant predictor of childhood immunization with Islamic religious affiliation being associated with lower odds of immunization. Knowledge about immunization by some parents is poor and the knowledge they have is habitually incorrect.[24] Parents do refuse to take their children for immunization, mainly because they want to protect their children from being harmed.[47, 48] Another well-known case in point concerns Nigeria, where in 2002–2003 rumors went round that the OPV was being used to lower the fertility of

young Muslim girl. This brought polio immunization to a halt for 12 months in several states. In July 2003 it called for OPV to be suspended, claiming to have evidence that it was contaminated with 'anti-fertility substances.[49] The result of the boycott was a nationwide polio epidemic that ultimately spread to 20 previously polio-free countries in Africa, Asia, and the Middle East.[11] Also, groups in India (certain Hindu and Muslim) have believed that vaccination is a concealed method of family planning, primarily targeting Muslims and Hindus.[47]

The political campaign that resulted in allegations that the polio vaccines were contaminated with anti-fertility agents was very successful in creating lasting fear in the minds of a great number of Muslims in northern Nigeria.[50]

2.5.5 Socio-economic status

Higher socio-economic condition of the parent is also associated with greater probability of the child being vaccinated under routine immunization program compared to mass vaccination campaigns.[51] There is a strong association between low socioeconomic status and under immunization. The association is probably mediated through the many factors related to poverty. Children from poor settings for instance, often have uneducated mothers, parents with low income and many siblings. Ignorance of health services and transportation difficulties is also common among the poor.[52] Socio-economic status of individuals strongly controls the behavior of individuals and thereby controls health-seeking behavior and ultimately child survival.[40] In addition, higher socio-economic status is associated with better health.[41] Rural–urban inequities is also another factor of immunization coverage and is certainly linked to supply-related factors, e.g. accessibility to vaccination facilities, provision of childhood immunization services, and demand-related factors such as the knowledge and attitude of mothers. About 38% of children in urban areas are reported to be more than twice as likely as rural children (16%) to be fully vaccinated.[12, 40,]

2.6 Access to Health Facilities

Health facilities access like antenatal care and place of delivery are other factors that are associated with the immunization status of children. Studies indicate that mothers who attend ANC and give birth at health facility are more likely to fully vaccinate their children as antenatal clinic is a means for women to be aware of immunization.[53,54] It is also similar to a study done in Columbia on the uptake, behavioral and attitudinal determination of immunization of hepatitis B among infants which showed that immunization was significantly associated with suggestion from health care practitioners.[55] A study done in Niger Delta area of Nigeria revealed that there was an association between the place of delivery and immunization status of a child.[56] A child born in a health unit was significantly more likely to have been vaccinated with BCG which is given immediately after birth, and to be up to date with their vaccination compared to a child delivered at home.[57] However, the health facilities in most PHC in the country are not devoid of problems. For instance, among steps for expanding access to RI, one of the most critical yet often neglected actions is identifying or updating the health facility catchment area map. This tool defines the communities being "served by" the health facility, thus helps the health facility plan and monitor immunization services for the community. Increasing access to routine immunization (RI) services by a health facility is an ongoing process which cannot be accomplished by a onetime effort.[58]

Before expanding services in a health facility that is accessible, it is important to first make sure that fixed services in a health facility are fully functional and friendly. It is also critical that the health workers are well trained, which includes good interpersonal communication skills and a clean working environment. Obstacles preventing access to RI include: lack of trained health staff, dilapidated buildings and health worker absenteeism. The LGA must regularly maintain and renovate its existing health facilities. Low cost expenditures can result

in increased access to RI services from the existing health facilities. Increasing access requires a well defined catchment area by the health facility. This allows for easier implementation and more accurate monitoring, and also for better linkage with the community.[58]

2.7 Concept of Compliance

Compliance is cooperative performance and adherence to prescribed therapy as recorded in the clinic record at a given period and that compliance criteria included among other things frequency of keeping clinic appointments.[59] According to Ajayi[60] compliance is the client's physical presence at the health unit or hospital on the appointment day to receive the prescribed care. In the context of this study, the term compliance is defined or conceptualized as receiving the required number of doses of vaccines at the appropriate age as shown on the immunization schedule and recorded in the child's record card. Non compliance may lead to a negative outcome on the ongoing immunization campaign in the country. The number of wild polio virus cases were recorded during the first quarter of 2006 which was over 200% higher than what was recorded during the same period of 2005, this was believed to be the result of poor quality campaigns, erroneous data and pockets of non-compliance linked to limited understanding of the need for multiple doses of OPV.[61]

Child's illness, procrastination and lack of knowledge about immunization and where to obtain services have often been cited by parents as the reason for non-compliance to RI[62]. Similarly, myths, rumors, ignorance and suspicion are major factors found to hinder routine immunization. In their study they found out that 16% of the population believes diseases are caused by evil spirit, witchcraft and heat. Twenty five percent (25%) have never heard of measles immunization. Also 27% did not believe immunization was effective while 4% were not allowed to go for immunization by their husbands. The remaining 28% felt that immunization was not necessary because the child was not sick.[63]

2.8 Vaccine Coverage and Drop-Out Rate

Innovative funding mechanisms have been put in place to help developing countries increase immunization coverage and provide new vaccines that can save even more lives. Governments have stepped up to the mark, with increasing budgets on vaccines and immunization since the year 2000. Many governments are demonstrating strong and effective leadership and national ownership of their immunization programs – a key requisite for ensuring the long-term sustainability of immunization investments.[23] Community participation is a key factor in raising vaccine coverage. Creating awareness of and public demand for the benefits of immunization is an essential component of an active immunization program in most countries.

WHO estimates that 2 million child deaths were prevented through vaccination in 2003 and immunization continues to be amongst the most successful and cost–effective public health interventions. The number of developing countries estimated to have met the target of the UNICEF medium-term strategic plan of 80 percent coverage for DPT3 in every district increased from 42 in 2002 to 45 in 2003. Nonetheless 89 developing countries have developed strategies for reaching hard-to-reach group with immunization.[11] Since 1985 expanded program on immunization (EPI) coverage has realized a worldwide increase as reported by WHO but in Nigeria much is yet to be done to achieve the targeted expectations[11] especially in the North.

2.9 Sources of Information to Mothers/Caregivers on Routine Immunization in Nigeria

Access to communication has been recognized as one of the most important factors in the improvement of maternal and child health services.[64]Mother's knowledge about immunization was found to be a predictor of full immunization in urban and rural areas of Nigeria.[65]This includes knowledge about symptoms of vaccine preventable diseases, immunization schedule and the importance of immunizing their children. The knowledge can

be acquired at antenatal care (ANC), community, private organization (e.g. IMMUNIZATION basics/Nigeria (IMMbasics) other NGOs, Religious houses, etc. High coverage of ANC and repeated contacts between the woman and the health services offer many opportunities for providing evidence based interventions likely to affect maternal, fetal and neonatal health and survival.[66]

Education is another tool that can aid mothers/caregivers to access relevant information on routine immunization. Similarly, education empowers a woman to access relevant health services, interact effectively and assimilate information relating to prenatal care, childhood immunizations and nutritional needs.[67] Studies mentioned that maternal education is a significant determinant of child health and no other factor has such impact. It was also observed that maternal education as the strongest independent factor for protection against childhood mortality.[68] Another study found that there was an obvious significance in children's vaccination pattern with mother's education level. It was also found that mothers who completed at least primary level of education were 1.7 times more likely to have their children fully immunized compared to those who had no education.[38]

Since 2009, Nigeria engaged the active support of traditional and religious leaders to support immunization in the country, especially in the campaign on the eradication of polio. The nation in 2011, had recorded progress in terms of reducing the number of endemic polio viruses in the country and also improvement in the routine immunization service delivery.[69] These progresses were attributed to the engagement of traditional and religious leaders. The community heads and heads of religious groups usually prompted children to be vaccinated through persuasion and not coercion of the mothers or caregivers.[69]

In a study that assessed willingness of mothers to receive SMS reminders for immunization services in Lagos, the result was greeted with good tidings as most mothers indicated an interest in receiving the remainder.[24] If this development can be embraced in the North it may

give hope with regard to increase in immunization coverage in the region. Because generally, non-attendance for immunization appointments remains a challenge to healthcare managers, and providers and studies have shown that reminders are effective in improving clinic attendance and increasing childhood immunization rates.[70]

2.10 Community Involvement and Communication of Information on Immunization

Childhood diseases may only be known through proper information dissemination to the mothers/caregivers in an atmosphere that is conducive for them. It has been shown that mothers are often very willing to have their children vaccinated, if convenient and good quality services are available. Community participation in the immunization program results in higher coverage, reduced left-outs and dropouts and ultimately reduction in the number of cases of vaccine preventable diseases (VPDs)[41] because; an informed community has confidence in the immunization program and therefore supports and demands immunization services and also provision of immunization services is tailored to the community's context (time, place and convenience).[71]

PHC staff can succeed in communicating information on routine immunization only by establishing regular dialogue with community. Partnership with communities is a crucial element of any strategy to reach the hard-to-reach. Where communities know their rights, are aware of the benefits of health services, and know where, when and how to access them, vaccination coverage is higher.[72] Health service communication with communities must be appropriate in content, language and mode of transmission, based on an understanding of how communities access and share information.[73] For example, mass media may reach wealthier and urban households but may be less effective in reaching poor and rural households.[72] Instead, ensuring that information is shared where communities normally gather and that messages are relevant for different population groups is likely to be more effective.[73]

Low immunization coverage has always been attributed to poor community mobilization and participation for the programs. However, a study found that immunization coverage in the rural community surprisingly better than that of the urban community, which was attributed to better community mobilization and participation in the delivery of immunization services.[74]

CHAPTHER THREE: METHODOLOGY

3.1 Background of the Study Area

The study area is Kaduna State which was created in 1976 from the Northern Central State with its capital at Kaduna. It shares boundaries with Niger State to the West, Zamfara,

Katsina and Kano States to the North, Bauchi and Plateau State to the East and the FCT and Nasarawa State to South.[75]

Kaduna State, the third most populous state in Nigeria, is in the North West geographical zone. It is the twelfth largest State in Nigeria accounting for some 5 percent (48,473 square kilometers) of Nigeria's total land mass. It is culturally diverse with a projected population of 7,589,699 people[76] (projection from 2006 Census) and a population density of 130 people per sq km and an annual rate of increase of around 3 percent. The State has 23 Local Government Areas (LGAs) and politically, it is further divided into 3 Senatorial zones: Kaduna South Senatorial zone, Kaduna North Senatorial zone, and Kaduna Central Senatorial zone with 255 wards and over 1000 health facilities. It has rural and semi- urban settlements in most of the LGAs.[77]

3.1.1 Health status

The leading cause of ill health and death in children within the State is communicable diseases: malaria, diarrheal diseases, respiratory tract infections and childhood vaccine preventable diseases topped the list. Mothers died frequently from complications of pregnancy and childbirth: anemia, obstetric hemorrhage, obstructed labor, sepsis and other reproductive health problems. Malaria was associated with 70 percent of illnesses in pregnancy and though the use of insecticide treated nets (ITNs) is known to be an effective preventive measure; their utilization is still low in the State.[77] Kaduna is situated in the epidemic belt of cerebro-spinal meningitis which has the highest fatality rate among the acute diseases. Kaduna's HIV/AIDS prevalence rate is 6 percent of the population of the State.[77]

3.1.2 Poverty in Kaduna State

Poverty level in Kaduna State increased from 67 percent in 2001 to 95 per cent in 2013.[78] Poverty is associated with lower health status and increased vulnerability; the poor are far

more likely to experience environmental and social conditions that contribute to poor health and an increase in risk of accident, injury, illness and death.[77]

3.1.3 Health facilities and accessibility

Kaduna has five tertiary hospitals, 28 secondary hospitals, over 1,000 Local Government facilities (PHCs) and an estimated 656 private sector facilities. Majority of the Government owned facilities conduct facility based sessions on routine immunization. Some of them do outreaches to the hard to reach areas. The under 5 populations is about 1,536,988.[78]

In the year 2006, several State Government hospitals benefited from major rehabilitation work. However, available resources were not adequate for the number of facilities in the state. This resulted in inadequate staffing of most facilities, poor maintenance of infrastructure inadequate services such as electricity, water supply and sewage, and inadequate supplies of equipment, drugs and consumables. However, scaling down the facilities to a manageable number had political implications for the government at both state and local government levels.[78]

Staff training was another key issue as some health workers operated without the requisite knowledge and skills, especially at PHC level. Continuous maintenance and upgrading of technical skills and expertise, as well as supervisory and managerial skills, needed to be satisfactorily carried out in an integrated and holistic way across the state.

3.2 Study Design

A cross-sectional descriptive study design was used, with the data collection using a semi structured interviewer-administered questionnaire.

3.3 Study Population

All mothers/caregivers whose children were within the age 12-23months in Kaduna State

Inclusion criteria: Mothers/care givers of children aged 12-23months who consented

Exclusion criteria: - Mothers/caregivers that were too sick to participate

- Mother/caregivers that are not available at the time

3.4 Sample Size Determination

The minimum sample size was calculated from the population using the formula[45].

$$\mathbf{n= \frac{Z\alpha^2 pq}{d^2}}$$

Where,

Zα= is the appropriate value for the standard normal deviation for the desired confidence

=1.96

d = is the level of significance/sampling error (0.05)

q= is 1-p.

p = Proportion of mothers with knowledge on immunization from a study conducted in Zamfara state 34%.[25]

Sampling size (n) therefore, was calculated as

$$\frac{1.96^2 \text{ x } 0.34 \text{ x } 0.66}{0.05^2} = 345$$

n = 345

Therefore, $N \approx 379$ (with 10% non response rate)

Minimum sample size for study was 345. This was however raised to 379 to allow for 10% non-response.

3.5 Sampling Technique

A multi-stage sampling technique was employed using the 3 senatorial zones in Kaduna state

Stage 1: Two LGAs (Rural and Semi-urban LGA) were selected from each senatorial zone using simple random sampling.

Stage 2: Two wards were selected from each of the six LGAs using simple random sampling.

Stage 3: Two settlements were selected from each of the 12 wards using simple random sampling.

Stage 4: Selection of respondents was done by spinning a bottle to identify the first household and one questionnaire was administered to contiguous households until sixteen (16) questionnaires were completed in each ward.

The sample size (379) was shared among selected LGAs, by using proportional allocation

The breakdown is as follows:

6 LGAs x 2 wards x 2 Settlements x 16 Households (1Respondent from each household)

3.5.1 Local Governments of Kaduna State by Senatorial Zones

1) Kaduna north zone:	**No of Wards**
Ikara,	11
Kauru	10
Kubau	10
Kudan	10
Lere	11
Makarfi	10
Sabon Gari	11
Soba	11
Zaria	13
2) Kaduna central zone:	
Birnin Gwari	11
Chikun	12

Giwa	11
Igabi	12
Kaduna North	12
Kaduna South,	13
Kagarko,	9
Kajuru,	11

3) Kaduna south Zone:

Jaba	9
Jema'a	12
Kachia	12
Kaura	10
Sanga	11
Zangon Kataf	11

The LGAs were selected from the three political zones of the state through a simple random sampling technique, without replacement (by balloting). The rural and semi-urban LGAs were ranked separately in each political zone and then randomly selected. The following combinations were therefore, selected:

- Kaduna north zone: Makarfi and Sabon gari
- Kaduna central zone: Gari Giwa and Kaduna North
- Kaduna south zone: Kachia and Jema'a in Zone three.

3.6 Grading of Mothers Knowledge, Perception and Practices

3.6.1 Knowledge on Routine Immunization

There were 7 variables on knowledge. Two options (True or false) were given for each variable on knowledge of mothers/caregivers towards routine immunization. Every correct answer "True" was scored 1 point while and incorrect answer "No" was scored 0 point

3.6.2 Perception

Eleven (11) variables were assessed for perception; all questions asked were in the negative perspective so the scores were given as: "Strongly agree;" (0 point), "Agreed"; (1 point), Disagreed; (2 points) and "Strongly disagreed"; (3 points)

3.6.3 Practices

For mothers' practices, there were 7 variables assessed with only 2 options (Yes/No). Variables 1-4 were asked in the negative perspective so, mothers who answered "No" (for variables number 1-4) were scored 1point each while those who answered "Yes" were scored 0 point each. For variable number 5-7, mothers who had institutional delivery, attended ANC up to 3X and encouraged/advised other women to vaccinate their children were scored 1 point each.

Method of grading knowledge, perception and practices of respondents

Terms	Number of variables	Range of scores	Grading
Knowledge	7	0-7	Satisfactory knowledge - 4-7 (55% - 100%) Unsatisfactory knowledge- 0-3 (0%-43%)
Perception	11	0-33	Good perception - 16-33 (49%-100%) Poor perception - 0-15 (0%-45%)
Practices	7	0-7	Good practices - 4-7 (55%-100%) Bad practices - 0-3(0%-43%)

3.7 Data Collection Techniques and Tools

Data were collected using a semi-structured interviewer administered questionnaire which was administered at the household level.

- Data collectors were trained to administer questionnaire
- Questionnaire
  - Socio-demographic factors
  - Sources of information on RI
  - Child's immunization record
  - Reasons for not immunizing children
  - Knowledge of mothers/caregivers on immunization
  - Perception towards RI
  - Sources of information on RI

3.8 Training

Twelve (12) research assistants, two per local government (with minimum health qualification, i.e. JCHEW) were recruited and trained by the researcher for 2 days in order to standardize data collection procedures for the purpose of this study. The following areas were covered under training;

- Interview skills,
- Community entry skills,
- Definition of Nursing Mother, Mother and Caregivers
- Translation of the questions into Hausa and English,
- Criteria for the selection of Mothers/Caregivers and Children,
- Field work and pre-testing,
- Selection of starting point and subsequent households for interviews using the bottle spinning for direction.

3.9 Pre-Testing

Having selected the study LGAs, the survey instrument (questionnaire) was pre-tested in Zaria, where Questions found to be unclear or unnecessary were modified or deleted accordingly. Appropriate corrections were captured subsequently to establish validity and reliability.

3.10 Data Management

3.10.1 Management of variables

All completed questionnaires were checked for completeness and consistencies of variables.

3.10.2 Statistical Analysis

Data were entered, cleaned and analyzed using Epi info^{TM} version 7. Descriptive statistics using absolute numbers for Univariate (simple percentages, range and measures of central tendency (mean, median) were used as appropriate. Also Bivariate analysis (Odds ratio and Chi2) were determined between variables and $p \leq 0.05$ was considered statistically significant and lastly multivariate analysis was conducted using logistic regression.

3.11 Ethical Considerations

Verbal and written consent were obtained from the participants. The purpose and importance of the study was explained to participants in the language they understood best before filling of the questionnaires. Consent form was given to all respondents to sign and they were given the opportunity to opt out of the study after explaining what was expected of them. No Personal identifiers were used for data storage. All data collected were secured and kept in a password enabled computer. Ethical clearance was obtained from Kaduna state Research ethics committee of Kaduna State Ministry of health.

3.12 Limitations of the Study

The survey did not explore other factors such as level of knowledge and perception of health care personnel on routine immunization, especially because they play important roles in immunization activities.

CHAPTER FOUR: RESULTS

4.0 Results

This section highlights results obtained from the quantitative analysis of respondents. A total of 379 questionnaires were administered based on the sample size determined and the response rate was 100%. The uni-variate analysis presents frequencies and percentages of their responses. The results are that of the socio-demographic characteristics of respondents, Socio-demographic characteristics of studied children, details of information received on routine immunization and knowledge, perception and practices of respondents on routine immunization. Bi-variate analysis results are presented to show the relationship between the socio-demographic characteristics, knowledge, perception and practices of respondents with the information received on routine immunization within the past 12 months.

Table 1: Socio-demographic characteristics of respondents

Characteristics	Frequency	Percent (%)
Age group (years)		
15-24	31	8.2
20-24	83	21.9
25-29	91	24.0
30-34	95	25.1
35-39	49	12.9
40-44	30	7.9
Mean age 28.6 SD ± 6.6		
Religion		
Christianity	134	35.4
Islam	245	64.6
Educational level		
Primary	67	17.7
Secondary	48	12.7
Tertiary	80	21.0
Koranic	159	42.0
None	25	6.6
Occupation		
Unemployed	246	64.9
Trading	69	18.2
Farming	22	5.8
Employed	42	11.1
Marital status		
Single	6	1.6
Married	361	92.2
Divorced	9	2.4
Widowed	1	0.3
Separated	2	0.5
Family setting		
Polygamous	234	65.8
Monogamous	127	35.2
Settlement type		
Semi-urban	193	50.9
Rural	186	49.1

A total of 379 respondents were interviewed majority practice Islamic religion (64.6%), completed Secondary education (42%) unemployed (64.9%), and married (92.3%).

Table 2: Socio-demographic characteristics of children aged 12-23months

Characteristics	Frequency	Percent (%)
Age (months)		
12-15	109	28.8
16-19	163	43.0
20-23	107	28.2
Mean age 17months (SD 5months)		
Sex		
Female	202	53.3
Male	177	46.7
Birth order of child		
1	106	28.0
2-5	238	62.8
>5	35	9.2

Majority of children whose mothers were interviewed were between age 16-19months old (43.0%), fifty three percent (53.3%) of the studied children were females. The children who fell between birth order 2-5 were over sixty two percent (62.8%) and only nine percent (9%) were found to be above 5^{th} birth order.

Table 3: Information received on routine immunization

Characteristics	Frequency	Percent (%)
Received information on RI within the past 12months		
Yes	112	29.6
No	267	70.4
Types of information received on routine immunization		
Benefits of routine immunization	83	74.0
Schedule of routine immunization	15	13.4
Side effects of routine immunization	4	3.6
Cannot remember any	10	9.0
Main Source of information on routine immunization		
Health Facility	23	20.5
Radio	69	61.6
Television	9	8.0
Newspaper	1	0.9
Town announces	0	0.00
Mosque	2	1.8
Church	3	2.7
Community meetings	5	4.5

Majority (70.5%) of the respondents did not get information on routine immunization within the past 12months. Out of those that had information, majority (74%) were about benefits of routine immunization with the common source of information being radio (61.61%).

Table 4: Knowledge on routine immunization

Characteristics	Yes (%)	No (%)
Immunization protects against vaccine preventable diseases	65.0	35.0
TB, pertussis, Diphtheria, Tetanus, Polio and Measles are all vaccine preventable diseases	35.5	64.5
BCG and Measles are not taken together at birth	19.6	82.4
Vaccines are either taken orally subcutaneous or intramuscular	4.8	95.2
Immunization prevents early child death and disability	11.6	98.4
Child immunization should be completed within the first 12months of life	64.8	35.2
Sickness does not prevent a child from tolerating vaccine	48.0	52.0

Seven (7) variables were used to determine mothers' knowledge on routine immunization. Majority of respondents (98.4%) were not aware that immunization prevents early child death and only 4.8% of respondents knew the correct route of administering vaccine.

Symptoms/complications of vaccine preventable diseases mentioned by the respondents are shown in the Figure below

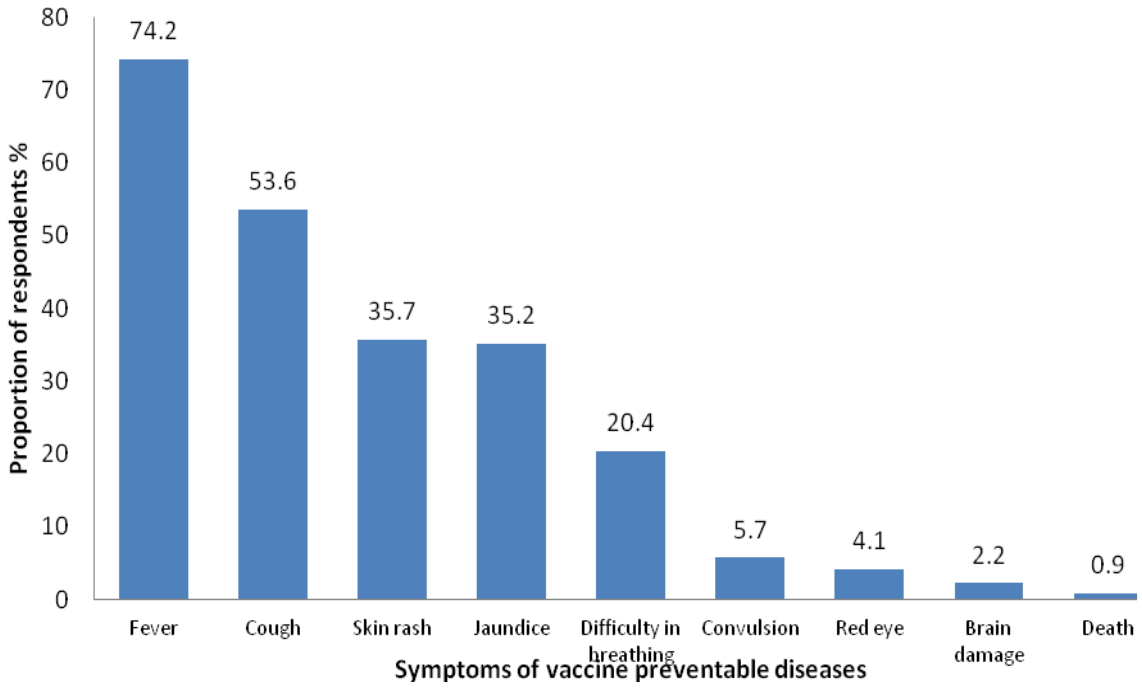


Figure 1: Knowledge of symptoms of vaccine preventable diseases

Of of the 379 respondents, fever (74.2%) was the commonest symptoms of vaccine preventable diseases mentioned by the respondents, followed by cough (53.6%). Some (0.9%) of the respondents believe VPD could lead to death.

Table 5: Graded knowledge on routine immunization

Knowledge	Frequency (n=379)	Percent (%)
Satisfactory knowledge	135	35.6
Unsatisfactory knowledge	244	64.4

After grading all variables used to assess knowledge, only about thirty six percent (36%) of respondents had satisfactory knowledge after grading as majority of them (64%) had unsatisfactory knowledge.

Table 6: Perception towards routine immunization

Characteristics	Strongly agree (%)	Agree (%)	Disagree (%)	Strongly disagree (%)
Our problem is malaria not immunization	26.4	45.6	15.6	12.4
Going for immunization is a waste of time	10.6	13.7	31.9	43.8
I do not take my child for immunization because my child is not sick	16.4	7.9	37.5	33.2
Going to my farm/trade/office is more important to me than taking my child for immunization	7.9	12.1	40.6	39.0
I do not like going for immunization because health care workers are unfriendly	39.6	27.2	20.1	13.2
I do not believe in immunization and will not take my child for immunization	25.9	23.5	28.2	21.1
It will be more convenient if health care workers can bring other vaccines to our houses just as in polio campaigns	31.7	33.5	17.2	17.7
Parents should be allowed to get exemption from vaccination on religious grounds	26.4	38.0	18.5	17.2
Immunization can cause infertility later in life	25.3	24.3	25.9	24.5
Getting multiple shots in one visit can overload a child's system	47.5	23.7	15.0	13.2
Do not trust health care provider's advise	18.5	11.6	33.8	35.4

Over forty five percent (45.6%) of respondents agreed that their problem is malaria and not immunization. While forty four percent (44%) of respondents strongly disagreed that going for immunization is a waste of time, forty eight percent (48%) of them strongly agreed that getting multiple shots in one visit could overload a child's system.

Table 7: Graded perception towards routine immunization

Perception	Frequency (n=392)	Percent (%)
Good perception	175	44.6
Poor perception	197	55.4

After grading all variables assessed for perception, majority of respondents (55%) had poor perception on routine immunization as compared to one hundred and seventy five (45%) who had good perception.

Table 8: Practices on routine immunization

Characteristics	Frequency	Percent (%)
Accept only polio vaccine during campaigns and not RI vaccines		
Yes	103	27.2
No	276	72.8
Child took traditional concoction in place of vaccine		
Yes	50	13.2
No	329	86.8
Prayed for child instead of taking vaccine		
Yes	201	53.0
No	178	47.0
Needed husband's permission before taking child for vaccination		
Yes	282	78.1
No	79	21.9
Place of delivery		
Institutional delivery	117	30.9
Non-institutional delivery	262	69.1
Attended at least 3 antenatal clinic during the pregnancy of this child		
Yes	48	12.7
No	331	87.3
Encouraged others to take their children for vaccination		
Yes	92	24.3
No	287	75.7

Seven variables were graded for practices of respondents. Majority (79%) of the respondents needed their husband's permission to vaccinate their children. Seventy three percent (73%) of respondents agreed to accepting vaccines for their children during campaigns but do not go to health facilities for routine immunization. Fifty respondents (13%) gave traditional concoction to their children in place of vaccine. Less than half (31%) of respondents had institutional as majority of them had non institutional delivery.

Table 9: Graded practices on routine immunization

Characteristics	Frequency (n=379)	Percent (%)
Good Practice	175	46.2
Bad Practice	204	53.8

After grading of all seven variables on immunization practices, less than half (46%) of respondents have good practices as opposed to two hundred and four (53.8%) respondents who had bad practices.

Table 10: Vaccination coverage for specific routine immunization antigens documented on vaccination card

Antigens	Immunization card Freq (n=177) (%)
At Birth	
BCG	177 (100%)
OPV 0	177 (100%)
HBV 0	177 (100%)
At 6 Weeks	
OPV 1	70 (39.5%)
DPT 1	68 (38.4%)
HBV 2	63 (35.6%)
At 10 weeks	
OPV 2	177 (100%)
DPT 2	177 (100%)
At 14 weeks	
OPV 3 (given at 14 weeks)	102 (57.6%)
DPT 3 (given at 14 weeks)	59 (15.6%)
HBV 3 (given at 14 weeks)	101 (57.1%)
At 9 months	
Measles (given at 9 months)	59 (15.6%)
Yellow fever (9 months)	61 (34.5%)

The coverage for the specific routine immunization antigens were gotten from both immunization card and maternal history but only the documented records on immunization cards were accepted to be valid.

Of all the 177 respondents who had their children's immunization cards, all (100%) of them had BCG, OPV0 and HBV0. DPT (Pentavalent vaccine) coverage were; 68(38.4%) DPT1, 177(100%) DPT2 and 59(15.6%) DPT3.

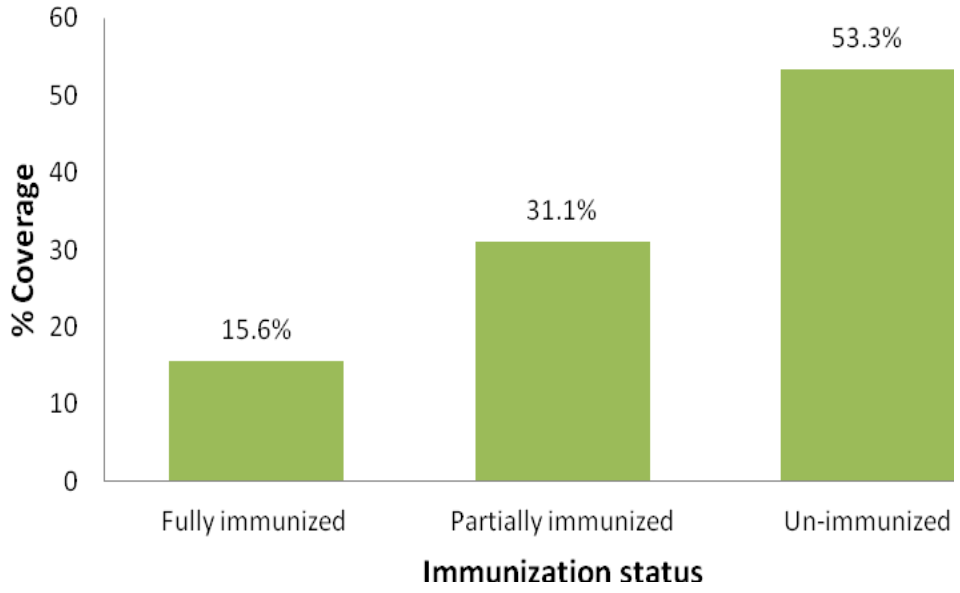


Figure 2: Immunization status of aged 12-23 months in Kaduna State, Nigeria

Over all, only 59 (16%) of respondents completed their children's immunization schedule as opposed to 118 (31%) who partially immunized and 202 (53%) who did not immunize their children with any vaccine.

Table 11: Vaccination status of children studied based on card and maternal recall

Vaccination status	Maternal recall/report Freq (n=379) (%)	Immunization card Freq (n=379) (%)
Unimmunized	112(29.6)	202(53.3)
Partially immunized	121(31.9)	118 (31.1)
Fully immunized	**146 (38.5)**	**59 (15.6)**

By maternal recall, 146(38.5%) of mothers claimed their children were fully immunized while only 59(15.6%) of them fully immunized their children as evidenced by vaccination card history.

Table 12: Association between getting information on RI within 12 months prior to study and immunization status of children

Received information on RI within 12 months prior to study	Vaccination coverage		Odds ratio(CI)	P-value
	Yes Freq (n=59) (%)	No Freq (n=320) (%)		
Yes	59(52.7)	53(47.3)	6.19 (3.60-11.50)	0.0021
No	0(0.0)	267(100.0)		

Respondents that received information on RI within 12 months prior to the study were 6 times likely to have immunized their children than those that did not receive any information.

The figure below shows the different reasons why mothers/care givers of children aged 12-23 months do not immunize or complete their child's immunization.

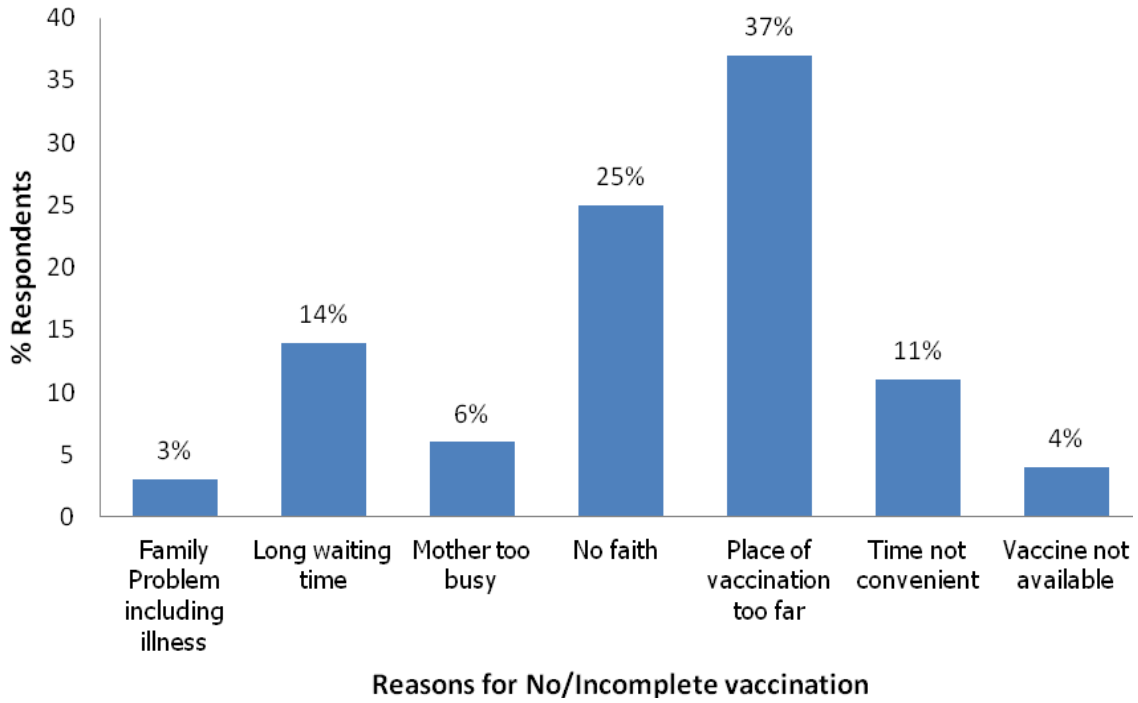


Figure 3: Reasons for incomplete or no vaccination among the studied children

Thirty seven percent (37%) of respondents do not vaccinate or complete their child's immunization because the place of immunization was too far while twenty five percent (25%) of them have no faith that immunization will protect their children against vaccine preventable diseases. Only four percent (4%) of the respondents did not vaccinate or complete their child's vaccination because vaccine was not available.

Table 13: Decision making about immunization

Decision maker	Frequency (n=379)	Proportion (%)
Husband	238	62.8
Jointly	87	22.9
Self	36	9.5
Father in-law	20	5.3

Respondents were asked about who takes decision on whether their children should be vaccinated or not. Husbands of most respondents 238(63%) decided whether the children should be vaccinated or not. A total of 87(23%) of the respondents jointly decided with their husbands and 36(9%) respondents said decisions were taken by the mothers alone.

Table 14: Associations between respondents' socio-demographic data and information on routine immunization

Characteristics	Have information on RI		Odds ratio(CI)	P-value
	Yes Freq (n=112) (%)	No Freq (n=267) (%)		
Age(Yrs)				
>28	44(23.3)	145(76.7)	1.84(1.17-2.87)	0.0342
≤28	68(35.8)	122(64.2)		
Religion				
Islam	74(30.2)	171(69.8)	0.91(0.58-1.46)	0.1252
Christianity	38(28.4)	96(71.5)		
Educational Status				
Educated	67(52.3)	61(47.7)	3.42(2.11-3.67)	0.0040
Not Educated	45(17.9)	206(82.1)		
Employment Status				
Not Employed	107(31.8)	230(68.3)	0.29(0.11- 0.76)	0.0313
Employed	5(11.9)	37(88.1)		
Marital Status				
Not Currently Married	5(27.8)	13(72.2)	1.10(0.38-3.15)	0.1501
Currently Married	107(29.6)	254(70.4)		
Family Setting				
Polygamous	45(22.5)	155(77.5)	2.04(1.29-3.21)	0.0010
Monogamous	60(37.3)	101(62.7)		
Settlement Type				
Semi-urban	46(28.8)	147(76.2)	1.76(1.12-2.75)	0.0050
Rural	66(35.5)	120(64.5)		

Respondents aged 18-28 years old were 1.8 times more likely to have had information on RI in the past 12 month and the relationship was statistically significant. Educated respondents and those living in the semi-urban areas were 3.4 and 1.76 times more likely to have had information on routine immunization than those not educated. Religion and marital status of respondents in relation to having information on RI in the past 12 months prior to this study were statistically significant.

Table 15: Association between knowledge and having information on routine immunization

Knowledge	Have information on RI		Odds ratio(CI)	P-value
	Yes Freq (n=112) (%)	No Freq (n=267) (%)		
Unsatisfactory knowledge	92(33.7)	152(62.3)	0.26(0.15-0.50)	0.0001
Satisfactory knowledge	20(14.8)	115(85.2)		

Ninety- two (33.6%) of respondents with unsatisfactory knowledge of immunization had no information on RI compared to twenty (14.8%) respondents who had satisfactory knowledge. This difference was found to be statistically significant.

Table 16: Association between perception and mothers having information on routine Immunization

Perception	Have information on RI		Odds ratio(CI)	P-value
	Yes Freq (n=109) (%)	No Freq (n=263) (%)		
Good perception	43 (24.6)	132(75.4)	2.55(1.60-4.05)	0.0011
Poor perception	66(33.5)	131 (66.5)		

Respondents with good perception had more information (33.5%) on RI than respondents with poor perception (24.6%). This difference was found to be statistically significant.

Table 17: Association between practices and having received information on routine Immunization

Practices	Have information on RI		Odds ratio(CI	P-value
	Yes Freq (n=112) (%)	No Freq (n=267) (%)		
Good Practices	80(45.7)	95(54.3)	0.51(0.29-0.90)	0.0000
Bad practices	32(15.7)	172(84.3)		

Respondents with good practices had more information (45.7%) than respondents with bad practices (15.7%). This difference was found to be statistically significant.

Table 14: Unconditional Logistic Regression to assess factors associated with access to information

Term		Odds Ratio	95%	C.I.	Coefficient	P-Value
1.	Age group (>28/≤28)	1.5596	0.9706	2.5061	0.4444	0.2420
2.	Educational status (Yes/No)	**1.9029**	**1.1053**	**3.2761**	**0.6434**	**0.0203**
3.	Employment status (Yes/No)	2.3858	0.8898	6.3969	0.8695	0.0840
4.	Family setting (Polygamous/Monogamous)	**0.3454**	**0.2027**	**0.5885**	**-1.0630**	**0.0001**
5.	Settlement Type (Semi-urban/Rural)	1.5465	0.9619	2.4865	0.4360	0.0719
6.	Knowledge on RI (Unsatisfactory/satisfactory)	**0.3323**	**0.1963**	**0.5625**	**-1.1018**	**0.0000**
7.	Perception of mothers (Good/poor practices)	**2.6044**	**1.5038**	**4.5106**	**0.9572**	**0.0006**
8.	Practices (Bad practices/Good Practices)	**0.4904**	**0.2725**	**0.8824**	**0.0174**	**0.0001**

Educational status and good perception of mothers were found to be associated with getting information on RI within 12months prior to this study while polygamous family setting, unsatisfactory knowledge and bad practices of mothers were independently associated with lack of information on routine immunization within 12months prior to this study.

CHAPTER FIVE: DISCUSSION

Immunization of children has remained an outstanding preventive measure against vaccine preventable diseases (VPDs) in modern medicine. However, information on routine immunization received by mothers and caregivers may make or mar its successes. Proper communication and dissemination of information on immunization to mother/caregiver cannot be overemphasized. Exclusion of well-planned communication on immunization issues will lead to inadequacy in meeting and sustaining coverage goals in hard-to-reach populations and to indemnify trust in vaccines used in routine immunization in some communities. Access to quality information on immunization by mothers or caregivers has a direct effect on awareness and vaccination rates in several countries where mass media is accessible and widely consumed,[1, 2] and from other sources.[13, 22]

The result of this study showed that most respondents are between the ages 30-34years (Mean= 28.6 SD= ±6.6), this was very similar to separate studies conducted in Ahmedabad in India and in southern part of Nigeria where the mean ages were found to be (28.6%) and (27.3%) respectively. [80,81] Although there was no significant association between maternal age and getting information on RI (CI= 0.97-2.51), the study showed that women older than 28 years had higher chance (OR=1.84) of getting information on RI than the lower age, similar to findings from studies conducted in Sudan and Ibadan.[8, 9] respectively. This could be because older mothers have better experience, know the effects and the importance of immunization on children than younger women.

Majority of the respondents practiced Islamic religion (64.64%) and were housewives (64.91%) which contrasted slightly with a study where Muslims were found to be (61.8 %) and housewives (65.6%)[21]. Furthermore, respondents that completed secondary school in this study were (41.95%), married (92.25%) while 52.82% of the respondents reside in rural settlements.

The socio-demographic characteristics of the children indicated that majority of children whose mothers were interviewed were between age 16-19months old (43.01%), females (53.30%) with birth order between 2-5 (62.8%).The sex of the child did not significantly affect the uptake of immunization in this present study and this is similar to other studies.[7,13,14] Sex can predict immunization status only if the child is from a society where gender inequality is prevalent. Birth order could have a close relationship with immunization status but such relationship was not explored in this study.

The educational status of the mothers in the study shows that 66.2 % having no formal education explained the low literacy level of women in the North West.[4] It is believed that low educational level of women tend to put their children at risk of health hazards.[3] Those educated were found to be more likely to have had information on RI than those without education (OR= 2.7) and hence likely to have had their children immunized. This finding was consistent with different other studies, where maternal education was a significant predictor of completeness of immunization because highly educated mothers were found to be more aware of the importance of immunization.[5,6] This study however was in contrast with a study which found no significant relationship between immunization status and mothers' educational level. [7]

The result of this study indicated that majority of the respondents (70.5%) did not get any information on routine immunization. The organization saddled with the responsibility is the National Orientation Agency (NOA) in collaboration with National Primary Health Care Development Agency (NPHCDA) and the Ministry of information. One of its main responsibilities is to provide adequate support to the states and local governments for them to run continuous awareness-building initiatives, as an important aspect of community mobilization.[25] Of the few (29.5%) respondents who received information on RI within 12 months prior to this study, only 13.4% of respondents received information on the Schedule

of routine immunization in their community. This could have increased the tendency for missed immunization or high dropout rate which might have caused the poor information access and poor immunization coverage. Majority of them (74.1%) got information on the benefits of routine immunization in their communities. This information could have influenced mothers that completed their children's immunization schedule to do so (OR=6, CI=3.60-11.50). The finding is similar to a study carried out in Turkey.[82] However, the information on the benefits of immunization alone may not be sufficient to achieve the desired coverage needed in the state. Poor impact of grassroots awareness-creating interventions in the studied communities is reflected in the limited knowledge and understanding of immunization amongst parents.[25]

On the sources of information 12 months prior to this study, majority (61.61%) got information from radio. This could be explained based on the fact that a significant proportion (52.8%) of respondents are rural dwellers who most often than not rely on radio as a means of getting information concerning the outside world. This influenced their likely hood of higher participation in getting RI information (OR= 1.76, CI= 1.1-2.8) than the semi-urban respondent. Awareness through the radio and television have increased vaccination rate in several countries where mass media is accessible and widely accessed as seen in two separate studies.[83, 84] This result is however not consistent with the finding in a research which showed that about 65% of women got their information on routine immunization at the antenatal clinics.[47] Our result did not reflect the role of health facility/health care workers in the provision of quality information on RI when compared with a study where it was observed that awareness of RI may be attributable to the quality of information provided to mothers at the health facilities.[65]

Utilization of available information on immunization was better achieved by the currently married women (29.6%) from this study. There was a statistical association (p= 0.38)

between women currently married and living with their husbands than those that are not. It could possibly be explained by the fact that majority of those interviewed were housewives (64.9%) and their husbands gives them moral support and possibly provide the means of getting information on routine immunization like the radio, television or even transportation fare to the health facilities.[83]

Mother's knowledge about immunization was found to be a predictor of full immunization in urban and rural areas of Nigeria[47, 64]. The results of this study showed that over all, only 35.6% of respondents have knowledge on routine immunization. This is similar to a study where maternal knowledge on immunization was also low (34%).[25]

Although majority of respondents knew that immunization protects children against vaccine preventable diseases (66.8%) and basic childhood immunization should be completed within 12 months of age (88.5%), only a few (4.2%) of the respondents knew the various routes of administration of vaccines and (6.6%) that vaccine preventable disease can cause serious disability and even death. Most of the respondents knew that fever (74.2%) and cough (53.6%) is the commonest symptoms of VPDs. These findings are similar to the findings in another study where despite poor knowledge of mothers generally on routine immunization, majority (66.0%) are aware that vaccines are effective in preventing VPDs, the study also showed that fever (57%) and cough (48%) were the commonest symptoms of VPDs.[25]

Maternal perception on routine immunization varied, as shown from the results of this study. Majority of the respondents (72.0%) indicated that their problem was malaria not immunization. In the same vein, majority of the respondents (66.9%) felt health care workers were unfriendly and (65.2%) felt routine vaccinations should be conducted from house to house. There were variations on responses to perceptions by the respondents from the findings; a significant proportion (69.2%) of the respondents trust the health care's advise while (64.4%) felt they should be exempted from taking vaccines based on religious beliefs.

The mis-conception of some respondents in this study possibly resulted in some of them having poor access to information on routine immunization as analysis showed that there was a significant association (OR=2.6) between mothers with good perception and having received information on routine immunization within the twelve months prior to the study. Some respondents identified some traditional means by which childhood illnesses were prevented in the community other than immunization. These traditional methods were sometimes mixed with orthodox methods because of strong ties with culture and religion.[19] However, a qualitative study in contrast, revealed a negative perception towards traditional medicine among caregivers of under 5 years with the majority believing that it cannot prevent childhood illnesses. [20]

There is a likely hood that immunization services provided by government through the Primary Health Centers may not be accessed by mothers/caregivers due to the distance of health facility. This may relate to a finding in this study where a significant proportion (65.2%) of respondents felt that routine vaccinations should be conducted from house to house. This finding is consistent with a study that showed those living farther away from a health facility have poor perception towards immunization services [15] and another study identified distance as a factor that influences individuals' use of basic health services, especially in rural, developing country settings [17]

Furthermore, what might possibly have reduced access and utilization of immunization may be traced to the maternal practices as regards ANC visit and place of delivery. The results indicated that only 12.9% of respondents attended ANC up to 3 times while pregnant with the index child. This could explain why majority of the respondents did not get information on RI because antenatal clinic is known to be a convenient avenue for women to get information on routine immunization program.[11] This study indicated that a significant proportion of respondents (69.1%) had non institutional delivery. A mother who delivers in the health

facility is more likely to get information and vaccinate her child than mothers who delivers outside the health facility. This could possibly explain why all (100%) the mothers who took their children for immunization and had their child's vaccination cards, received BCG, OP0 and HBV0 even though some of them did not complete their children's immunization schedule. Similar findings have been reported in previous studies.[10, 56, 58]

Logistic regression model built on all significant variables (ie Age, Educational status, Employment status, Family setting, Settlement type, Knowledge, Perceptions and Practices) revealed that maternal education and good perception were independently associated with access to information on routine immunization. On the other hand, mothers from polygamous family setting, those with unsatisfactory knowledge or those with bad practices of RI did not get information on routine information and could possibly not have immunized their children. Findings of this study are consistent with findings of many similar studies that assessed factors determinants of RI information and child vaccination. For example, findings in two separate studies found that children whose mothers have primary education or non are less likely to be immunized than those whose mothers have post primary education.[46, 53]Also, different studies conducted in Burkina Faso, Thailand and South West Nigeria revealed that vaccination uptake is considered to be highly culturally sensitive, influenced by local perception on childhood diseases and decisional processes in households[45, 55, 56, 85]

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Access to quality information on immunization by mothers or caregivers has a direct effect on awareness and vaccination rates. This study found majority of children whose mothers were interviewed were between age 16-19months old (43.01%), females (53.30%) with birth order 2-5 (62.80%).

Majority of respondents have unsatisfactory knowledge (64.4%) and perception (55.4%) towards routine immunization and analysis proved that mother's educational status, family setting, knowledge, perception and practices about immunization are important factors that influence access to RI information which are ultimately predictors of full child immunization. This study found the main source of information within 12 months prior to study to be via radio.

Accepting polio vaccine during campaigns and not routine immunization, taking concoctions and praying in place of vaccine, delivering outside the hospital setting and not completing immunization schedule were some of the bad practices of majority (54%) of mothers/caregivers in Kaduna State. This also was found to be associated with poor access to information on immunization.

6.2 Recommendation

The following recommendations were made based on the findings from this study.

6.2.1 General recommendations

NPHCDA government should:

- Re-strategize methods of creating awareness to change bad perceptions and practices on RI among people of the state.

6.2.2 Specific recommendation

1. The Kaduna State Ministry of Education and Agency for Mass Education should collaborate to improve the literacy level of the people
2. State Ministry of Education should create convenient adult education classes to improve educational status of mothers
3. Kaduna State government should divert resources specially for girl-child education in the state
4. It is recommended that all Health Centers and Health Personnel should encourage and educate the parents about the values and benefits of the vaccination and vaccine preventable diseases and its consequences to children's health
5. Kaduna state government, through the Ministry of Information should intensify sensitization of mothers/caregivers to improve their knowledge on Routine Immunization through Radio and Television jingles
6. Local government authority should provide the parents with some health information by distributing printed materials such as brochures, pamphlets and leaflets in local languages.

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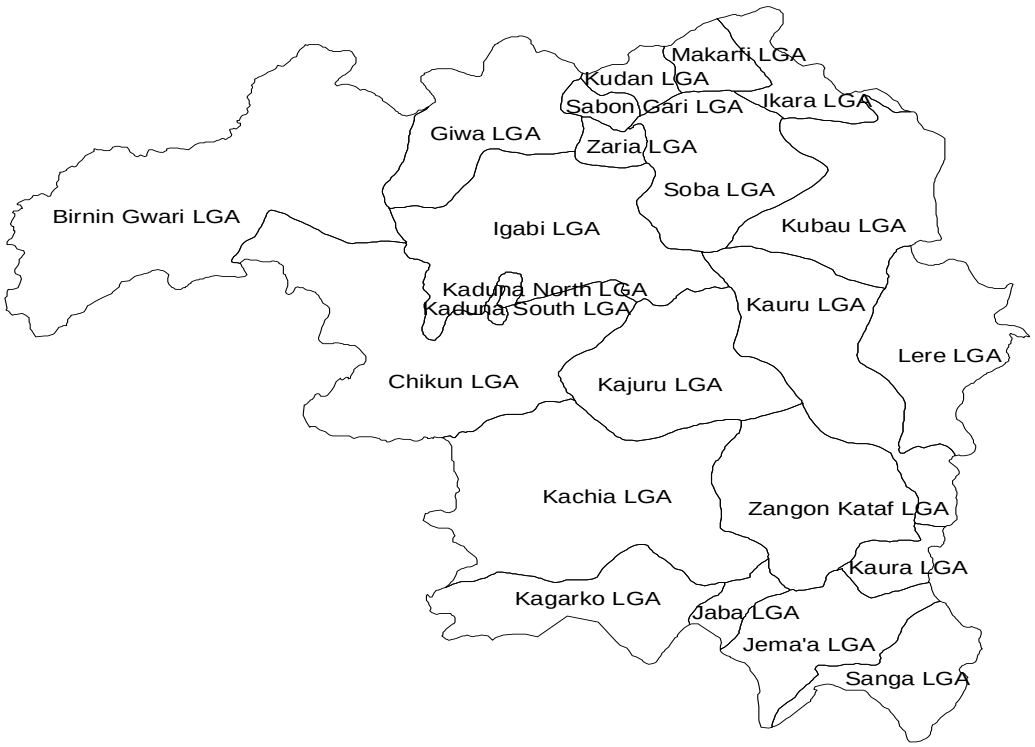
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APPENDICES

Appendix 1: Map of Kaduna State showing the 23 lgas



Appendix 2: Time line

S/N	ACTIVITY	2014 APRIL	2014 MAY	2014 JUN	2014 JUL	2014 AUG	2014 OCT	2014 NOV	2015 FEB	2015 MAR	2015 JUN	2015 OCT	2016 JAN	PERSON(S) RESPONSIBLE
1	Development of Proposal/data collection tools													Researcher
2	Ethical approval Kaduna state MOH													Researcher
3	Recruitment/Training of research assistants													Researcher
5	Pretest													Research team
6	Questionnaire administration													Research team
7	Data entry & analysis													Researcher
8	Report writing													Researcher
9	Pre-internal thesis defense (Abuja)													Researcher/ University/ NFELTP
10	University internal & external thesis defense													Researcher/ University/ NFELTP

Appendix 3: Ethical clearance

MINISTRY OF HEALTH, KADUNA STATE

All Communication to be addressed to:
THE HON. COMMISSIONER
Quoting Reference and Date
Telephone: 234-248048
Website: ttp://www/moh.kd.gov.ng.
Email: info@moh.kd.gov.ng.

Independence Way,
P.M/;B 2014
Kaduna.
Kaduna State, Nigeria.

HEALTH RESEARCH ETHICS COMMITTEE KADUNA STATE MINISTRY OF HEALTH.

Our Ref: ..... Date.....

Your Ref:.....

.....

.....

.....

MINISTRY OF HEALTH RESEARCH ETHICAL CLEARANCE

ACCESS AND UTILIZATION OF INFORMATION ON IMMUNIZATION AMONG MOTHERS/CAREGIVERS OF CHILDREN AGED 12-23 MONTHS IN KADUNA STATE.

Name of investigator:	DR. LYDIA TAIWO
Address of investigator:	Nigeria Field Epidemiology and Laboratory Training Programme, Federal Ministry of Health 50, Halleseiisi Street, Asokoro Abuja
	Ahmadu Bello University, Zaria
Date of Receipt of Application:	24th October, 2014
Date of Ethical Approval:	24th November, 2014
Research period:	November 2014 to October 2015

- You are kindly requested to give researcher maximum cooperation during the period of research'-
- However it is mandatory for researcher to submit his findings to the State Ministry of Health, Kaduna.

F.A. KURAH (MRS)
SECRETARY, ETHICAL COMMITTEE

Appendix 4: Consent form

KNOWLEDGE, PERCEPTION AND SOURCES OF INFORMATION ON IMMUNIZATION AMONG MOTHERS/CAREGIVERS OF CHILDREN AGED 12-23 MONTHS IN KADUNA STATE

Names and affiliations of researchers: This study is being as a thesis to be submitted to Ahmadu Bello University, Zaria, for the award of MPH-field epidemiology.

Sponsors of research: This study is sponsored by the researcher and NFELTP

Purposes of research: To determine the knowledge, perception and sources of information on immunization among mothers/caregivers of children aged 12-23 months in Kaduna State

Procedure of the research, what shall be required of each participant and approximate total number of participants that would be involved in the research: A participant will be chosen from each household through balloting. Each participant will be interviewed regarding their knowledge, perception and sources of information one immunization. In total we expect to recruit 379 participants into this study.

Expected duration of research and of participants' involvement: In total, we expect you to be involved in this research for less than 1 hour.

Risk(s): There is no anticipated risk from the study.

Costs to the participants, if any, of joining the research: Your participation in this research will not cost you anything.

Benefit(s): The goal of this research is to know how information on immunization affects immunization status find the factors associated with getting infected with the HIV.

Confidentiality: All information collected in this study will be strictly confidential; no identifier that can be linked to you will be used in any publication or reports from this study.

Voluntariness: Your participation in this research is entirely voluntary.

Consequences of participants' decision to withdraw from research and procedure for orderly termination of participation: You can also choose to withdraw from the interview at any time. However the researchers promise to make good faith effort to comply with your wishes as much as is practicable.

Statement of person obtaining informed consent:

I have fully explained this research to _____ and have given sufficient information, including about risks and benefits, to make an informed decision.

Date: _____ Signature: _____

Name: _____

Statement of person giving consent:

I have read the description of the research or have had it translated into language I understand. I understand that my participation is voluntary. I know enough about the purpose, methods, risks and benefits of the research study to judge that I want to take part in it. I understand that I may freely stop being part of this study at any time. I have received a copy of this consent form to keep for myself.

Date: _____ Signature: _____

Name: _____

Witness' signature (if applicable): _____

Witness' name (if applicable): _____

This research has been approved by Ahmadu University, Zaria, Ethics Committee and Kaduna State government.

You can contact the principal investigator,

Dr. Lydia A. Taiwo,
shallisbabe@yahoo.com 08025522003

Appendix 5: Questionnaire (data collection tool)

SECTION 1: SOCIO-DEMOGRAPHIC DATA OF MOTHERS

1. How old are you? (In years)……..

2. What is your religion? (a) Islam (b) Christianity (c) Traditional religion (d) others (specify)……

3. What is your highest level of Education? (a) None (b) Koranic (c) Primary (d) Secondary (e) Tertiary

4. What is your primary occupation? (a) Housewife (b) Trading (c) Farming (d) Teaching (e) Others……

6. Marital status? (a) Single [ ] (b) Married [ ] (c) Divorced [ ] (d) Widowed [ ] (e) Separated [ ]

7. How many wives does your husband have, including you? .....

SECTION 2: CHILD INFORMATION

8. Age of index child? ……..

9. Sex of the child? Male [ ] Female [ ]

10. Birth order (position) of the child ……

11. Did you receive ante-natal care during the pregnancy of this child? Yes [ ] No [ ]

If no, skip to question 14

12. Where did you receive ante-natal care when you were pregnant for this child?

(a) Health centre [ ] (b) General Hospital [ ] (c) Chemist [ ] (d) Traditional Birth Attendant's [ ] (e) Home [ ] (f) others (specify)……

13. How many doses of tetanus toxoid (TT) injection did you received during the pregnancy of this child who is 12-23months? (a) None [ ] (b) One [ ] (c) Two [ ] (d) Three

14. Where did you give birth to the child in question? (a) House [ ] (b) Health centre [ ] (c) General Hospital [ ] (d) Traditional Birth Attendant's home [ ] (e) others (specify)……

Now I will like to ask you some general questions on immunization. Please be truthful about your responses.

SECTION 3: AWARENESS ON ROUTINE IMMUNIZATION

15. In the last 12 months, did you receive any information on routine immunization? Yes [ ] No [ ]

If no, proceed to 18

16. What type of information did you receive on routine immunization? (a) Benefit of routine immunization [ ] (b) Schedule of routine immunization [ ] (c) Side-effects of routine immunization [ ] (d) other information (specify)……

17. What is the source of the information on routine immunization? **(Interviewer indicate all that is mentioned)**

(a) Health facility [ ] (b) Radio [ ] (c) Television [ ] (d) Newspaper [ ] (e) Town announcer [ ] (f) Mosque [ ] (g) Church [ ] (h) Community meetings [ ] (j) others (specify)…..

SECTION 4: KNOWLEDGE AND PERCEPTIONS ON IMMUNIZATION AND VACCINE PREVENTABLE DISEASES

18. What is the purpose of childhood immunization? (a). To protect childhood diseases [ ] (b). To cure diseases in children [ ] (c). To prevent diseases in children [ ] (d). Others (specify)……

19. Which of the following are vaccine preventable diseases? **(Interviewer indicate all that is mentioned)** Tuberculosis [ ] Poliomyelitis [ ] Hepatitis B [ ] Diptheria [ ] Pertusis (Whooping Cough) [ ] Tetanus [ ] Measles [ ] Yellow fever [ ] Meningitis [ ] Malaria [ ] Cholera [ ] others (specify)…… Don't Know [ ]

20. Please tell me symptoms/signs that will make you think your child has the following vaccine preventable diseases **(Tick all that is mentioned; Interviewer should not prompt/ do not read out the list)**

Symptoms/presentation	**Measles**	**Polio**	**Tuberculosis**
Fever			
Cough			
Skin rash			
Limb paralysis			
Difficulty in breathing			
Jaundice			
Vomiting after bouts of coughing			
Red and discharging eye			
Catarrh			
Weight loss			
Death			
Others(specify)			

21. How many times should a child be taken to a health facility to complete his/her routine immunization? ……

22. At what age (or at what time) should a child receive his/herroutine immunization? (**Interviewer, only one response allowed for each visit)**

	First	Second	Third	Fourth	Last
Age in months/at birth					

23. Please mention the common side-effects of childhood vaccines that you know **(Interviewer indicate all that is mentioned but do not read out the list)**

(a) Fever [ ] (b) Rash [ ] (c) Swelling at injection site [ ] (d) Injection abscess [ ] (e) Pain at injection site [ ] (f) Don't know any [ ] (g) convulsion [ ] (h) Paralysis [ ] (i) others …….

24. Immunization can cause infertility later in the life of the child? Yes [ ] No [ ]

25. Immunization prevents allchildhood diseases? Yes [ ] No [ ]

26. Childhood vaccines are safe for children? Yes [ ] No [ ]

Perception variables	Strongly agree	Agree	Neither agree or disagree	Strongly disagree	Disagree
27. How confident are you in the safety of routinely received childhood immunizations?					
28. Do you think immunizations are for keeping children healthy?					
29. I trust the vaccine advice my child's main health care provider gives me.					
30. My child's main healthcare provider is easy to talk to.					
31. Parents should be allowed to get exemption from vaccination for their child on religious ground even if it were clear that it raised the risk of disease for the child and everyone else					

32. Do you trust the government to set policy for childhood vaccines?					
33. Getting multiple shots in one visit can overload a child's immune system					
34. The use of outreach is helping to increase coverage for immunization					
35. Routine immunization is sufficient to reach all children for immunization					
36. If mothers attend antenatal care at health facility they are more likely to immunize their children					
37. If mothers deliver their babies in health facility they are more likely to use immunization services provided there					
38. Day-to-day activities of the mother affects their attending clinic for immunization as scheduled for the child					
39. The level of education of the mother is important in increasing the use of immunization services					
40. Age of the mothers plays an important role in the use of immunization services					
41.Immunization is expensive					

42. How effective do you think childhood vaccines are in preventing diseases that they are supposed to prevent?

(a) Very effective [ ] (b) Effective [ ] (c) Somehow effective [ ] (d) Not effective at all [ ] (e) I don't know [ ]

43. Do you think there are local preparations that can serve as substitute for immunization to prevent childhood diseases? Yes [ ] No [ ]

If yes, Please mention the local preparations? .....

SECTION 5: IMMUNIZATION EXPERIENCE

44. Please what are the activities carried out in the clinic/health facility when you take your child for immunization services?

……

……

45. Which of the mentioned activities do you consider a waste of time and why?

.....

46. When you go to the clinic for your child's immunizations, did the nurse ever refuse/ delay immunizing your child because of the following reasons? (a) Child too young [ ] (b) Clinic has no vaccine [ ] (c) No syringes available [ ] (d) others [ ]……

47. Has your child ever gone to the clinic few days after the date of his/her vaccination appointment? Yes [ ] No [ ] if no go to Q49

48. If yes, did the nurse ever refuse/ delay immunizing your child for this reason?

Yes [ ] No [ ]

49. Has your child ever gone to get immunization when he/she had cold/catarrh, diarrhea or fever? Yes [ ] No [ ] **If no go to Q51**

50. If yes, did the nurse ever refuse/delay immunizing your child for this reason?

Yes [ ] No [ ]

51. Have you ever missed vaccination for your child? Yes [ ] No [ ]

If no go to Q53

52. If yes, what are your reasons **(Interviewer do not read the list, circle all that is mentioned)**

(a)Too far **(**b) No money (c) Too busy (d) No permission from husband (e) Vaccine out of stock (f) others (specify)

53. What is the average number of hours you spend in the clinic when you go for immunization? .....

54. Do you consider the time you spend in the clinic to be (a) too long (b) short (c) Adequate (d) others (specify?)

55. Do you pay for the services? Yes [ ] No [ ]

56. If yes, how much do you pay? .....

57. Do you think it's too expensive?

SECTION 6: ATTITUDE TOWARDS ROUTINE IMMUNIZATION (INDICATE THE RESPONSES)

Attitude variables	**Strongly agree**	**Agree**	**Neither agree or disagree**	**Strongly disagree**	**Disagree**
58. Our major problem is malaria and not polio so immunization is not my priority					
59. To me going for immunization is a waste of time					
60. I will not take my child for immunization because my child is not sick					
61. I need the permission of my husband to take my child for immunization					
62.Going to my farm/work/trade is more important to me than taking a child to health facility for immunization					
63. I do not like to go to health facility for immunization of my child because the health workers are not friendly					

64. I cannot trek to health facility for my child's immunization because I do not have means of transportation to the health facility which is far from my house					
65. I do not believe in immunization and will not take my child for immunization					
66. I want health facility to come to my house to give immunization to my child as I do not have time/do not like to go the health facility					

Now I want to ask you some questions about the immunization of your child who is under five

SECTION 7: ACCESS AND UTILIZATION OF INFORMATION IN RELATION TO IMMUNIZATION COVERAGE

67. Did you ever take this child to health facility to receive routine immunization?

Yes [ ] No [ ]

If no, ask question 64 and then skip to question 70

68. Why didn't you take this child to health facility to receive routine immunization?

Please mention the reason(s) ……

(Interviewer skips to question 70 after asking question 64)

69. How many times did you take this child to health facility to receive routine immunization? 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ]

70. Which of these vaccines did this child received? **(Interviewer describes the vaccines to the mother and then ticks as appropriate)**

Age	**Vaccines**		
At Birth	BCG ☐	OPV0 ☐	HBV1 ☐

6 Weeks	PENTA1 ☐	OPV1 ☐	HBV2 ☐
10 Weeks	PENTA2 ☐	OPV2 ☐	HBV3
14 Weeks	PENTA3 ☐	OPV3 ☐	
9 Months	Measles ☐	Yellow Fever ☐	

71. Do you have a card where this child's routine immunization is recorded? Yes [ ] No [ ]

If the mother does not have the card, ask why? ----------

72**. If yes**, please can I see it? ***(Interviewer record the vaccines and the date at which the vaccines were given)***

(If the child received all the recommended vaccines go to question 74 if not ask question 73

73. Why did you take this child to receive some vaccines and not the other vaccines?

(a) Lack of information (tick all that applies):

I. Unaware of need for immunization

II. Unaware of need to return for 2nd or 3rd dose

III. Place and/or time of immunization unknown

IV. Pass experience of effect of immunization

V. Others (specify)……

(**b) Lack of motivation (tick all that applies):**

I. No faith in immunization

II. Place of immunization too far

III. Time of immunization inconvenient

IV. Vaccine not available

V. Mother too busy

VI. Family problem, including illness of mother

VII. Child ill – not brought

VIII. Child ill – brought but not given immunization

IX. Long waiting time

X. Other (specify)……

(c) PHC centres and its workers within the environs

I. It is not accessible to me

II. The workers are not friendly

III. They workers collect money

IV. The vaccine is out of stock

SECTION: DECISION MAKING

74. Who decides whether or not to immunize your children? **(Interviewer indicates one)**

(a) Self [ ] (b) Husband [ ] (c) Jointly with husband [ ] (d) Father-in-law [ ]

(e) Mother-in-law [ ] (f) Religious leader (g) Others (specify)……

75. Do you need your husband's permission before you can take your child to the health facility for immunization? Yes [ ] No [ ]

76. Did you advice someone to take her child for immunization in the last 12 months? Yes [ ] No [ ]

76. Will you take your next child to the health facility to receive routine immunization? Yes [ ] No [ ]

(If no) Please mention the reasons why you won't take your next child to the facility to receive immunization? ……