CHILDHOOD IMMUNIZATION AND RELATED KNOWLEDGE, PERCEPTION AND ATTITUDE OF MOTHER OF 12-23 MONTHS CHILDREN IN FAGGE LGA KANO STATE

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DECLARATION

I hereby declare that this work is the product of my research efforts undertaken under the supervision of Prof. Mohammed Kabir and Dr. Abubakar Mohammed Jibo and has not been presented anywhere for the award of a degree or certificate. All sources have been duly acknowledged.

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CERTIFICATION

This is to certify that the research work for this dissertation and the subsequent write-up of "Bello Emmanuel Toyin with registration number SPS/12/MPH/00005" were carried out under my supervision.

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DEDICATION

This work is dedicated to the members of my family who gave their time to be part of this study.

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LIST OF ABBREVIATION

BCG – Bacillus Calmette Guerin

DPT – Diphtheria, Pertussis and Tetanus

OPV – Oral Polio Vaccine

NPI – National Program on Immunization

LGA – Local Government Area

MOH – Ministry of Health

MV- Measles Vaccine

UN – United Nations

UNICEF- United Nation Children's Fund

WHO – World Health Organization

YV – Yellow Fever Vaccine

ABSTRACT

Introduction: immunization has been shown to be the most successful and cost-effective public health intervention in the 20th century. However, immunization coverage has remained low in Nigeria although vaccines are provided relatively free by the government. Effort has focused on the health workers, health system and logistics with little attention being paid to maternal factors like knowledge, perception, belief and practices.

Objective: to determine childhood immunization and d related knowledge, perception and attitude of mothers in Fagge LGA Kano State.

Methods: a structural questionnaire was administered to two hundred and four (204) care givers who had children 12-23 month old in Fagge LGA Kano state

Results: forty seven of the caregiver had tertiary education, 33% had secondary education. 18.1% and 2% had primary education. About ninety-six percent of the caregivers knew about routine immunization and the major source of information was the health workers (56.9%). Fifty-five percent of caregivers were aware of the disease for which the child was immunized against while 45% were not ware sixty four point two percent of the caregiver knew the age in which the child should receive immunization. As far of the mother (2%) did not know that a child was supposed to visit the immunization centre to compete immunization. Fifty one percent acknowledged that the risk of adverse effect do not outweigh the benefits of immunization. Ninety two point two percent of the respondents agreed that immunization protected the children against vaccine preventable disease.

Conclusion: most mothers studied have good knowledge, positive perception and uptake of immunization. Material education was significantly associated with knowledge and acceptance of immunization. The findings are important in the design and implementation of childhood immunization programs.

CHAPTER ONE

1.1 Introduction: Immunization is the process by which a person is made resistant to infections and diseases. This is achieved through the administration of vaccines, which stimulate the immune system to protect the person against infection and diseases. Immunization is thus a proven tools for controlling and eliminating live threatening infection, it is cost effective and accessible even to vulnerable members of the society, furthermore it does not involve measure life styles changes.[1]

In 2012, the world health assembly (WHA) endorsed the global vaccine action plan (GVAP). Among the key indicators of GVAP include delivering and sustaining 90% DPT3 national coverage and greater than 80% of DPT3 coverage at sub – national levels by 2015.[3]Global immunization coverage for 2013 showed great variation between regions[1]. Hemophilus influenza type b (Hib) 3 doses coverage showed 90% in the America's and only 27% in south East Asia. Measles, records showed that 84% of children received the first dose before their second birthday, while 148 countries have included a second dose as part of routine immunization. Meningitis, about 150 million Africans was vaccinated by the MenAfricaVac vaccines. Pneumococcal conjugate vaccine showed a global coverage estimated at 25%. Polio, there was 84% coverage with 3 doses globally, though cases are only seen in Afghanistan, Pakistan and Nigeria.[2]

The national primary health care development agency (NPHCDA) is the federal government agency charged with the responsibility of partnering with other agencies to provide immunization programs geared towards immunization coverage of all at risk population in Nigeria[5]. The antigens provided for routine immunization are 1 dose of

Bacilli – CalmetteGuarin (BCG), 1 dose of yellow fever vaccine, 3 doses of DPT, 3 doses of hemophilus influenza b vaccine and 3 doses hepatitis b vaccines, (these last 3 antigens constitute the penta vaccines). Four doses of oral polio vaccines, and 3 doses of pneumococcal conjugate vaccines (kano state not inclusive) and oral vitamin A supplementation.[3,4]

The immunization coverage level and trends are used to monitor the performance of the immunization system.[5] The NDHS 2013 report showed that immunization coverage in Nigeria using the DPT3 indicator was 38%.[6]

Among the main reasons identified for poor coverage includes lack of maternal awareness of immunization services. Other reasons include poor maternal knowledge on immunization and immunizable diseases and negative perceptions about immunization. Thus, maternal attitudinal disposition towards uptake of childhood immunization is shaped by several factors.

Maternal challenges associated with uptake childhood immunization impacts immunization coverage's. Exploring these challenges will assist in appreciating the constraints which mothers of 12–23 months old children encounter in the quest of immunizing their children and thus strategizing on overcoming these challenges.[7,8]

1.2 Problem Statement

Immunization prevent about 2 – 3 million death every year and countless number of morbidities and disabilities.[1]In 2013, 112 million infant worldwide were fully immunized, this approximates to about 84% coverage, about 21.8 million infant missed out on basic immunization. [1,2] The

benchmark for routine immunization coverage using DPT3 indicator is 90% and 80% at sub – national levels, but the situation in Kano state is far from ideal, the NDHS report of 2013 showed DPT3 coverage of 18.9% for Kano state, other antigens coverage were not better. BCG antigen coverage was 27.5%, measles antigens 25.3%, andpolio3 antigen was 57.9% .[6]This clearly shows the huge deficit in coverage level of the various antigens levels in Kano state.

Maternal knowledge and attitude about immunization and immunizable diseases is known to influence immunization coverage, but what remain unclear is which is a stronger influence, the perceived benefits of immunization or the perceived risks of not being immunized.[9]

This study is aimed at obtaining community based information on

Knowledge, perception and attitude of mothers of 12-23 months old children towards immunization and immunizable diseases, and how these affect levels of immunization coverage's.

1.3 Rationale/justification of the study

Determining the immunization coverage is a proxy for monitoring performance of the immunization system .[5]Since this proposal aim to explore the demand side of the immunization system, it thus attempt to highlight contextual issues giving rise to demand side barriers to immunization uptake. Identifying demand side barriers to immunization uptake will guide future strategies to enhance immunization coverage in children with its accompanying public health benefits.

Theories and Concept

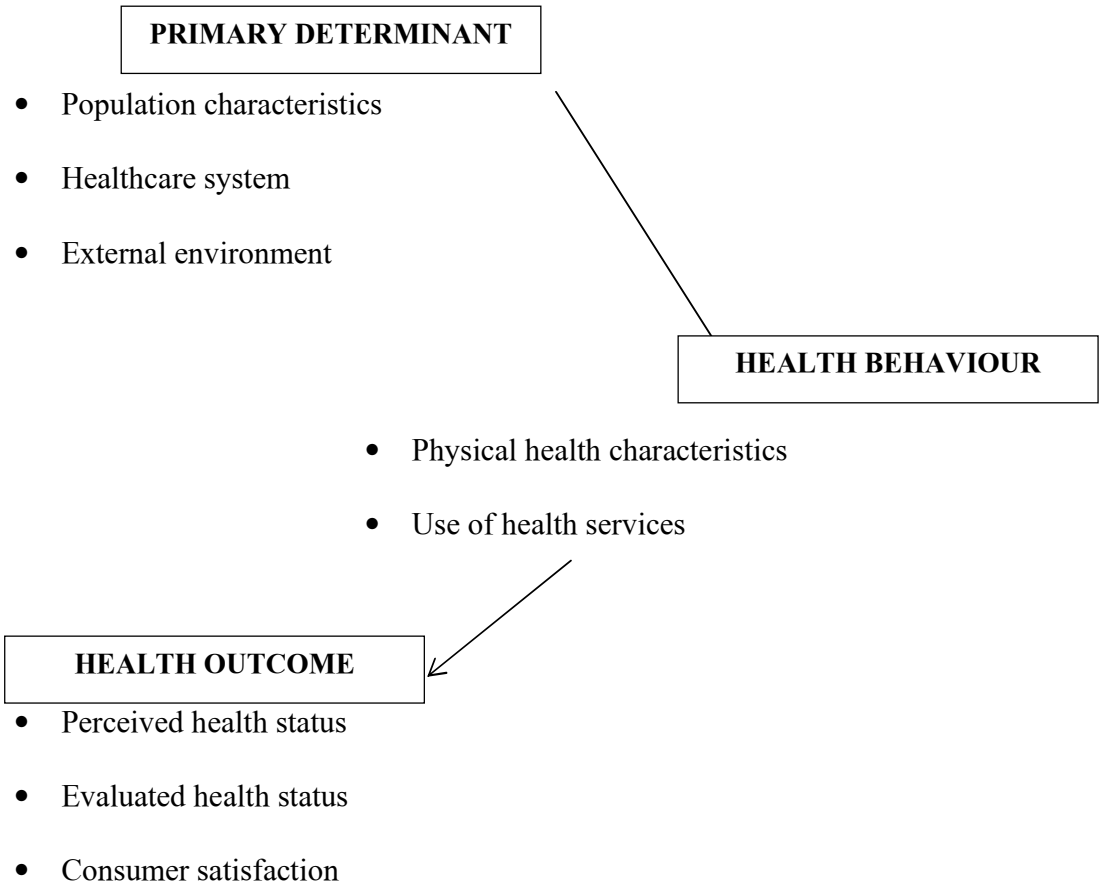
Theory of knowledge acquisition. Knowledge acquisition typically involved the process of acquiring, processing, understanding and recalling information. The primary component of knowledge acquisition theory is that people are born without knowledge and thus acquire knowledge continuously throughout one's life time. Knowledge acquisition is done through visual, aural and tactile signals that a person receives via his or her senses; once signals are received they are encoded into information which lead to building a cognitive model called a schema. Cognitive dissonance occur when somebody notices features that do not match the schema for a known cognitive model.[10,11]

Concept of Perception. Current concept of perception is embedded in the subject of cognitive psychology. Perception involved both physical senses (Smell, Hearing, Touch, Taste and Proprioception) and cognitive process involved in interpreting these senses. Current perspective on perception focus on the specific way human minds interpret stimuli from various senses and how this interpretation affect behavior.[12]

Theory of Attitude In psychology, an attitude is an expression of favor or disfavor toward a person, place, thing, or event (the attitude object). In other words attitude is the expression of evaluation summation of ideas, events, objects or people. There are several theories and models of attitude, some of these include the ABC model, the Meta – cognitive model. The ABC model describes the components of attitude as affect, behavior and cognition. The affective component of attitude is the emotional reaction one

has toward an attitude object. The behavioral component of attitude is the way one behaves when exposed to an attitude object .The cognitive component refers to the thoughts and beliefs one has about an attitude object. The meta-cognitive model of explains that attitude is governed by a rethinking process and that attitude must be in harmony with our belief and knowledge network, once attitude conflicts with these network i.e. cognitive dissonance occurs and that humans have an inner drive to restore harmony through the rethinking process. Attitude is a way of being in a position or tendencies to respond a situation in a particular manner. This is an intermediate variable between the situation and the response to this situation. It helps explain that among the possible practices for a subject submitted to a stimulus, that subject adopts one practice and not another. Attitudes are not directly observable as are practices. It is worth noting that attitude do not always translate to behavior, infact intension are better predictors of behavior. Behaviors are the observed action in response to a stimulus[13, 14]

Conceptual Framework based on Anderson model of health services utilization.[15]



1.4 Research Questions

1. What do mothers of 12 – 23 months children in fagge LGA know about childhood immunization and immunizable diseases?
2. What is the perception of mothers of 12 – 23 months old children in fagge LGA about childhood immunization and immunizable diseases?

3. What are the challenges associated with uptake of childhood immunization in Fagge L.G.A?

1.5 General Aim and Specific Objectives

General Aim: to determine childhood immunization, and related knowledge, perception and attitude of mothers in Fagge L.G.A Kano State.

Specific Objectives

1. To assess knowledge and perception of mothers of 12 – 23 months old children in Fagge L.G.A on childhood immunization and immunizable diseases.
2. To determine the attitude of mothers of 12-23 months old children towards uptake of childhood immunization.
3. To identify challenges associated with uptake of childhood immunization in Fagge L.G,A.

CHAPTER TWO

2.0 **LITERATURE REVIEW**

2.1introduction

Access to immunization services does not necessarily translate into uptake of services; key factors necessary for uptake of immunizations services include knowledge about immunization and a positive attitude towards it. This knowledge should include knowing the benefits of immunization, the diseases it prevents, the time frame for the various routine immunization schedules and the consequences of immunization refusal to the person in question and to the community at large.[16]

The main reasons for poor coverage are related to immunization services and to parental knowledge and attitudes. The most frequently factors associated to low coverage are access to services, health staff attitudes and practices, reliability of services, false contraindications, parents' practical knowledge of vaccination, and fear of side effects, conflicting priorities and parental beliefs. Family demographic characteristics.[16]

2.2 Routine immunization (RI) coverage for 12-23 months

The age of the child at the time of vaccination and the adherence to the vaccination schedule are attributes of immunization which must be borne in mind when assessing coverage, since children vaccinated too late or too early, have limited chances of benefiting from the vaccination

process.[17]Vaccination coverage is calculated as the percentage of persons in a target age group who received a vaccine dose. Administrative coverage is the number of vaccine doses administered to those in a specified target age group divided by the estimated target population. Vaccination coverage surveys estimate vaccination coverage by visiting a representative sample of households with children in a specified target age group e.g. 12–23 months. Vaccination dates are transcribed from the child's home-based record or are recorded based on caregiver recall of immunization events.[4]

Since 1974 when the World Health Organization (WHO) established the Expanded Program on Immunization, global coverage of the four core vaccines (BCG vaccine diphtheria-tetanus-pertussis vaccine DTP, polio vaccine, and measles vaccine) has increased from less than 5% to greater than 84%, Coverage with the third dose of DTP vaccine (DTP3) by age 12 months a key indicator of how well an immunization system is performing. Estimated global DTP3 coverage for 2013 was 84%. Global coverage estimates for the second routine dose of measles-containing vaccine (MCV2) was reported to be 35% by the end of the second year of life. [4]

The WHO global vaccine coverage report for 2013 variation between regions. Showed Europe has DPT3 coverage of 96%, BCG 95%, Measles containing virus (MCV1) antigen 95%, polio3 96%. The Africans region showed the following coverage value for the following antigens DPT3 75%, BCG 83%, MCV1 74%, Polio3 77%.[4]For Nigeria and Kano state, the NDHS report of 2013 showed Nigeria had the following coverage values DPT3 38%, BCG 51%, MCV1 42%, Polio3 42%, while Kano state had the following value DPT3 18.9%, BCG 27.5%, MCV1 25.3% and Polio3 57.9%.[8]

2.3 Knowledge and perception of mothers on childhood immunization

The knowledge and perception on immunization influences mothers and caregivers health seeking behaviour which translate increased uptake of immunization by their children. This was aptly demonstrated by Saddiqi, N. and others (2010) using a cross-sectional survey , utilizing World Health Organization's 7 x 30 cluster sampling strategy, carried out in peri-urban Karachi, Pakistan where the objective was to evaluate the relation between the knowledge of mothers about EPI vaccinations and their infant's coverage. Effect of other socio-demographic variables on mothers' knowledge and child's coverage was also assessed. A total of 210 mothers (7 per cluster) were identified and interviewed. The number and proportion of mothers correctly identifying the seven EPI diseases were as follows; Tuberculosis 57 (27.1%), Diphtheria 53 (25.2%), Pertussis 71 (33.8%), Tetanus 70 (33.3%), Measles 85 (40.5%), Polio 91 (43.3%) and Hepatitis B 65 (31.0%). Only ninety four (44.8%) children were appropriately vaccinated for their age. Using multivariate analysis the conclusion was that mothers' knowledge about EPI vaccination in peri-urban Karachi was quite low and not associated with their children's EPI coverage. Mothers' educational status, however, was significantly associated with increased Child's coverage. [18] In another cross sectional descriptive study carried out in Ahmedabad India , in 2010, higher literacy level in mothers was again demonstrated to be associated with improved knowledge on immunization. Low literacy level of mothers was found to be a matter of worry, since many of them don't know about the diseases for which their child is being immunized ,they are ignorant about the timings of vaccinations, but some of them follow the Immunization card schedules. On the contrary, mothers with higher level of literacy showed the following results on the various vaccine preventable diseases (VPD) Poliomyelitis was highest, as 85% of women could tell that it is a VPD. Knowledge of women regarding Hepatitis B

& Pertusis was lowest i.e. 15% and 10% respectively. The knowledge of women in all educational strata when compared with that of Illiterate women showed highly significant difference indicating that those who were educated had clear lead in knowledge about VPD. It is pertinent to note that the source of knowledge for VPD for most respondents was attributed to mass media in 35% of the cases while the health workers were responsible for imparting knowledge in 47% of the respondents.[19]

Studies in Tanzania and Ethiopia have clearly highlighted the importance of maternal knowledge in uptake of immunizarion.

Joyce Lyimo showed in her study in 2011 that there is a relationship between low uptake of vaccination and caretaker's not knowledgeable of the month of vaccination and importance of supplementary vaccination. This relationship with knowledge emphasizes the effect of health seeking behaviour and exposure to knowledge among the mothers/caregivers.[20]

Perception of mothers/ caregivers toward health institutions has an association with immunization coverage, Tadesse and others clearly demonstrated this in their study of 2008 in southern Ethiopia whereby they demonstrated a negative perception was likely to decrease immunization uptake by two times. They also re-emphasized findings by other studies on importance of mothers/caregivers knowledge on immunization uptake. They also demonstrated that Mothers who knew the schedules of vaccine were 3 times more likely to vaccinate their children fully than mothers who didn't know the vaccination schedule; also mothers knowledge about vaccination schedule had significant association with completion of immunization.[21]

In Lagos, southern Nigeria, studies have demonstrated mothers have a fairly good knowledge on immunization. Abidoye, A.O. and Odeyemi, K.A. demonstrated this in their study. Using a Descriptive cross sectional study method they showed majority of the respondents interviewed, knew about BacilleCalmette Guerin (BCG), oral polio, dipthteria, pertusis and tetanus (DPT), in the following respective percentages 89.5%, 85.5%, 78.5%, 71.0%, 73.5% . and 95.5% of them perceived immunization to be beneficial. On the knowledge of the diseases that these vaccinations prevent, only 54.5% of these respondents actually knew the diseases that these vaccinations prevent in their children. Most of these respondents had secondary school education. Most (62%) of the respondents were between the ages of 26 and 36 years and 37% of their children were less than one year old. The study finally highlighted poor knowledge on yellow fever, measles, hepatitis B virus (HBV), and meningococcal vaccinations respectively and suggested the use of health education to raise public awareness.[22]

In a end line survey carried out by Partnership for Reviving Routine Immunization in Northern Nigeria (PRRINN) in 2011,

"increase in knowledge about the immunization schedule across the three states between base line and end line surveys; knowledge of each of the three immunization times increased at least 4-fold (from an average of 15% to more than 60%)", this reflects a significant improvement In knowledge on immunization by caregivers. The average uptake for at least one immunization across the three states was 69%, compared to a base line figure of 32%, while uptake of immunization for four immunization doses was 60% compared to an average base line of about 20% in 2009. The improved knowledge base was reflected on the improved trend of immunization uptake between 2009 to 2011 in areas covered by this survey.[23]

2.4 The attitude of mothers of 12-23 months old children towards uptake of childhood immunization

Ruhul Amina and others (2012) showed that being knowledgeable about immunization and high literacy level in caregivers does not automatically translate to high immunization uptake, but rather the attitude of the caregiver is a predictive factor on uptake of immunization in presence of this two demand side attributes. In their study , using mixed method design they showed that the population of Dili (capital of Timor-Leste republic)despite high literacy rates and relatively good access to immunization services and communication medium , vaccination uptake was poor due to a multitude of factors which influence health care-seeking behavior. These include cultural beliefs and practices, levels of education and health knowledge, service accessibility, gender roles, and out-of-pocket expenses for clients. These factors ultimately influence the attitude of mothers and caregivers towards immunization uptake.[24]Bofarraj, M,M(2008) showed in his study that fear for immunization due to poor knowledge is what informs the negative attitude towards immunization. This relatively linear association he illustrated using a cross sectional survey of nonrandomized sample, of 200 mothers were interviewed at primary health care clinic at Al-Beida City Libya, 19% (n =38) of those who did not fully immunize their children as when due, developed a negative attitude due to fear that immunization will negatively affect the health of their children, a notion arising from poor knowledge.[25]

A study commissioned by the National Programme on Immunisation (NPI) in 2006 which examined knowledge, attitude and perceptions regarding vaccination in 11 states in northern Nigeria, investigators concluded that the attitude of most mothers/caregivers towards immunization services is positive and they rely on the efficacy of the vaccine to protect against

disease; there was a poor attitude towards polio immunization because of rumors and free immunization services [26]. This negative attitude to polio seen in northern contrast sharply with that seen in southern Nigeria as shown in the study of Abidoye, A.O. and Odeyemi, K.A. where uptake of polio was 87% .[22]

Studies in Nigeria have shown that factors related to maternal knowledge and attitudes, leads to complete non-vaccination of children aged 12-23 months, while problems associated with supply side of the immunization system leads to partial non-vaccination.[16]Omotara B,A. and others (2012) through series of focus group discussions posited in their study that the attitudinal difference between young mothers and the elderly caregivers as regards immunization, while both are aware of immunization, their attitude contrast sharply, while the young mothers have a good disposition towards immunization and are soliciting for other incentives like drugs for other ailments to enhance their participation in immunization programs, the elderly caregivers are cautiously optimistic about immunization program, the elderly caregivers hinge their attitudinal posture to dearth in information from health workers. Their study also outlined the fact that cultural factors influences attitudinal disposition towards childhood immunization.[27]

2.5 Challenges Associated with uptake of Childhood Immunization

The availability of immunization services does not automatically translate to uptake of childhood immunization, but rather several factors determines whether the service is utilized or not. Those factors that act as barriers to uptake of childhood immunization are situated in the demand and supply side of the immunization system operating in an environment. World Health Organization (December 2009) report on *Epidemiology of the Unimmunized Child* highlighted

reasons for non completion of a child's immunization schedule, these reasons are related to the immunization system in 45% of cases, 26% cases are from family characteristic, 22% are from parental attitude and knowledge and 7% arise due to limitation from immunization related information. While reasons adduced for a totally unimmunized child were related to the immunization system in 32% of the cases, 42% were related to parental attitude and knowledge, 21% to family characteristics and 5% are related to communication and information i.e. lack of media/radio exposure, poor communication due to perceived provider rudeness or a lack of trust in him/her, the dissemination of inadequate or incorrect information by health care worker, and a lack of community involvement in the expanded program on immunizations[28].

Family characteristics i.e. illiterate caregivers, low socio-economic status, living in large family/having older siblings, and belonging to a minority group/low caste or migrant status. And if the household is a long distance from the nearby health facility , they are known to influence immunization uptake .Education level of mother or maternal caregiver was most frequently associated with a child's vaccination status.[28]

Data from the growing up in Ireland survey is used highlight a strong socioeconomic gradient in childhood vaccination. Household level variables such as socioeconomic status, household structure, income and entitlement to publicly funded care are found to contribute substantially to immunizationuptake.[29] Ahmed, S and others(2012) showed the influence of socioeconomic status (SES) on immunization uptake in a study carried out in Peshawar, Pakistan where it was shown that the immunization level even though below international benchmark, but levels of immunization of children of people with higher SES was higher than those with lower SES.[30]Clouston,S and others (2009) corroborated this fact in a study carried out in Madagascar ,

and went further to postulate on the dangers apparent in such situations when unchecked.[31]In Nigeria Oyefara, J,K (2014), also showed socioeconomic status influence immunization uptake. In a study carried in Lagos Nigeria. A total of 265 respondents were randomly sampled for the survey using multistage random sampling technique. Analysis of data using univariate, bivariate, and multivariate statistical techniques on the generated data revealed significant relationship between women's level of education and full immunization of their children. Specifically, 38.9% of women without any formal education had fully immunized their children compared with 86.9% of women with secondary education. In addition, 90.9% of women who assessed themselves to be average on wealth assessment compared with 45.3% of the poor had fully immunized their children. this emphasizes the need for an all encompassing approach that will involve all social classes and communities on child immunization to have more than 90% immunization coverage ensure minimal morbidity and mortality from vaccine preventable diseases. [32] Other factors acting as barrier to uptake of immunization related to family characteristics e.g. Clashes of immunization days with the economic activities of mothers, especially the market days, and long distance trekking to immunization centers.[33]

The role of Parental attitude and knowledge towards the influencing uptake of immunization has being shown by Tadesse H (2008)., Saddiqi N (2010) and Omotara,B,A. (2012) in their separate studies.[18, 21, 27]Amina, R,and others (2012) further explained using qualitative research methodology the role played by some health workers in enhancing the promotion of negative attitude towards uptake of immunization.[24] The contribution of post immunization complication to negative parental attitude towards immunization uptake was said to be negligible according to Amina, R, , this was supported by the findings of Jegede AS, and Owumi BE (2013).[24, 33]

The reasons or factors linked to immunization systems were access and/or distance to services,` missed opportunities for immunization, low health worker experience/knowledge, and unavailable vaccines or supplies. Issues relating to access to services included perceived cost of services, cost of transportation, and lack of health insurance. Distance to services was most frequently identified as a reason for low vaccine uptake by caregivers living in rural and/or remote communities, often in locations without a health facility or where outreach services were not conducted on a regular basis. Nevertheless, in a few articles, duration of travel time in an urban setting was noted as a reason for low vaccine uptake. Many children remained under-vaccinated due to missed opportunities, which included not having vaccination card at the time of the clinic visit, vaccinator absent at the designated time of immunization services, and children receiving curative services only (i.e. the child's immunization status was not assessed). Additionally, contraindications to vaccinations were incorrectly interpreted; and children for whom vaccinations were otherwise appropriate were not vaccinated. Although less frequently reported, under-vaccinated children linked to mothers with a lack of or limited access to prenatal or antenatal care.[28]

Missed opportunities are a source of challenge for immunization uptake. In a study conducted in India , the following situation was enunciated, of 30 unimmunized children, 67% were females, 87% were born at home, 64% were of birth order 3 or more and 57% belonged to the low SES. Being unaware about the need for immunization (64%) and fear of adverse events (20%) were the major factors for the child remaining unimmunized. Other reasons for the child remaining unimmunized were rumors, the mother being busy, the distance to the session site and the lack of faith in immunization services. Of the 34.8% Partially Immunized children, the major reasons for not completing immunization were fear of Adverse Events (18%), lack of information about the

next due date for vaccination from the health staff (18%), being unaware of the need for returning for complete immunization (16%), and the mother being too busy to take the child for vaccination (15%). The other contributing factors were the child being ill, delaying vaccination for another time, and rumours and misinformation regarding contraindications. A DPT1-DPT3 dropout rate of 27.1% was observed in the present study. Dropout rates were higher in of very low SES 32.0% and 31.9% in low caste population groups when compared to the overall dropout rates. When evaluated in relation to place of immunization, higher dropout rates were noted for immunization sessions performed at government health facilities (38.9%) in comparison to outreach session sites through the government system (26.1%) and private health facilities (25%). The majority of immunization services for all the antigens were being performed at outreach session sites. The study findings revealed low hospital/Primary Health Center (PHC) immunization rates for all antigens including BCG (13.3%) and OPV zero dose (7.6%) vaccination. The authors opined that these challenges reflects a problem of access and specifies the need for community mobilization, involvement of local opinion makers and Information Education and Communication (IEC) activities before immunization sessions.[34] In a study to quantify missed opportunities for immunization, and reasons for their occurrence and to evaluate the extent of inappropriately given vaccine doses, a hospital based study carried out in Kenya, showed missed opportunities for immunization rate accounted for 3% of 12-23 months clinic attendee .[35] In Nigeria, studies for missed opportunities was undertaken by Abdulraheem I. S and other (2011) .Using a cross sectional survey, their study showed about two third (62.8%) of the children were not fully immunized by one year of age, 33.4% had experienced a missed opportunity for immunization and 36.4% were partially and incorrectly immunized. Parents objection, disagreement or concern about immunization safety (38.8%), long

distance walking (17.5%) and long waiting time at the health facility (15.2%) are the most common reasons for partial immunization.[36]

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study area

Fagge is one of the 44 LGA that make up Kano state. Fagge LGA area lies on lat.12.0067^0 N and 8.5222^0 N in the eastern outskirt of old Kano city with its headquarter in the suburb of waje. It is about 300 metres east to the ancient wall of Kano, and is bounded to the north by Ungogo LGA, to the east and southwest by Nassarawa LGA, to the west by Dala LGA and to the south by Municipal LGA. It has an area of 21 km ^{2}, and has ten political wards namely Fagge A, B, C, D, E, Kwachiri,Yammata, Rijiyarlemo, Sabongari east and west. It has a projected population of 251,517 for 2014 (based on the 2006 census). The Hausa and Fulani are the main ethnic groups, with Yoruba and igbo and other Nigerian tribes mainly located in the Sabongari wards. Islam is the predominant religion, the Christian's are mainly located in the Sabongari wards. Commerce and trading is the main occupation , there is a well-established artisan industry involved in leather works, black smiting, and tailoring. Most of the houses are of the traditional setup with multiple occupancy. There are 8 public health facilities with several other private health outfits. The health seeking behavior is both orthodox and Islamic medical alternatives. The traditional bone setters also maintain a visible presence.[37, 38, 39.]

3.2 Study design

A descriptive concurrent mixed method design was used.

Mixed method design is defined as a research method that is focused on the research questions. Concurrent type of mixed method research has the dual advantages of qualitative studies (in-depth details) and quantitative studies (trends and generalization).[40]

The WHO 7 X 30 cluster sampling technique was used for quantitative data collection.

3.3 study population

The study population includes children 12 to 23 months old and their mothers/caregivers.

Inclusion and exclusion criteria

Inclusion criteria; All mothers and caregivers of 12 – 23 months old children that are resident fagge LGA during the study period was eligible for the study.

Exclusion criteria; Mothers and caregivers who refuse consent.

Those who are on short term visit to Fagge LGA.

3.4 Sample size determination

-The sample size for the 12 – 23 month children was 210 since the WHO 30 x 7 sampling technique was used.

3.5 Sampling technique

-To determine the childhood immunization of 12 – 23 months old children in Fagge L.G.A, The WHO 30 x 7 cluster sampling technique was used. This is a two stage sampling technique[41].A

list of all the streets in each of the ten political wards in Fagge LGA was obtained. In the first stage three streets which represent the clusters i.e. the primary sampling units, was randomly selected from each of the political wards, thus corresponding to thirty randomly selected clusters for Fagge LGA. Probability proportionate to size sampling method would employed in street sampling i.e. streets with more houses have higher probability of selection. In the second stage seven houses was selected from each cluster. The first household was selected randomly and subsequent household was selected in a sequence until a total of 7 eligible children in the age group 12-23 months are selected from each cluster.

-The mother and the caregivers was sampled purposively for qualitative interviews.

3.6 Data collection methods

The tools for data collection will include

1. Structured questionnaires with mostly closed ended questions will be used to collect quantitative data
2. In-depth interviews with key informants (religious, political and traditional leaders) and focus group discussion was used to elicit the narratives of mothers and caregivers of 12 – 23 months old children, on the challenges associated with uptake of childhood immunization in Fagge L.G,A.

   The questionnaires for quantitative data was divided into five parts, the first part would collect information on the socio-demographic profile of the respondents, while the remaining part of the questionnaire would assess knowledge, perception and attitude of mothers/caregivers on childhood immunization uptake and immunizable diseases , and finally the immunization status of 12 – 23 months old children in Fagge LGA.

3.9. Plan for Data Management

3.9.1 Measurement of Variables

Quantitative variables like knowledge, attitude and perception was operationalized. Likert Scale is a five (or seven) point scale which is used to allow the individual to express how much they agree or disagree with a particular statement.

Validity and reliability of the survey instrument would be determined by a pilot test on the 5.0% randomly selected participants The goal of the pilot study is to validate the instrument and to test its reliability. The results of the pilot survey will help establish reliability, face and content validity of the questionnaire.

Qualitative data management involves (1)data organization (2) data reduction to allow for summarization and categorization (3) pattern and themes are identified and linked .

3.9.2 Statistical analyses

When the data was collected, they were crosschecked and entered into a personal computer. Data was analysed using MINITAB version 12.21. Microsoft word and Microsoft excel (2010) was used for creating tables, charts, and graphs. A quantitative variable was summarized using appropriate measures of central tendency and variability. Categorical variables was presented as frequencies and percentages. Bivariate analysis was involved in the use of the chi-square test for assessing the significance of associations between categorical groups. The level of significance will be set at $P < .05$.

3.10 Ethical consideration

Administrative, traditional and informed consent was sought from the respective authorities. Co-operation of the respondents was sought by explaining the aims and objectives of the study to them as well as the fact that their responses will be handled confidentially and was used only for the purpose of the study. Names and any form of identification of the respondents was not request in order to ensure that the respondents remained anonymous and hence ensuring confidentiality.

3.11 Limitation

Vaccination status of children taken from mothers' recall are prone to bias

CHAPTER FOUR:

RESULTS

Two hundred and four questionnaires were administered to mothers and caregivers of 12-23 months old children in Fagge LGA. All the two hundred and four (204)) questionnaires were completed and returned, giving response rate of 100%. All the mothers and care givers were females.

4.1. Socio-demographic Characteristics of Respondents

Majority of the respondents are between the age of 26-35years (47.6%) with mean and standard deviation of 28.8 ± 6.5 years. The respondents were also predominantly Muslim and Hausa Fulani, 187 (91.7%) and 154 (75.5%) respectively. Although majority of respondents had tertiary education 95 (46.6%), but up to 174 (85.3%) were un-employed. Similarly majority of the respondents are married 174 (85.3%)

Table 1: Socio-demographic Characteristics of Respondents

Variable	Frequency/Percentage
Age (Years)	
15 -25	76 (37.3)
26 – 35	97 (47.6)
36 -50	31 (15.2)
Mean ± SD = 28.8 ± 6.5	
Religion	
Islam	187 (91.7)
Christianity	17 (8.3)
Ethnicity	
Hausa/Fulani	154 (75.5)
Yoruba	27 (13.2)
Igbo	11 (5.4)
Others	12 (5.9)
Educational Status	
Quranic Only	37 (18.2)
Primary	4 (1.9)
Secondary	68 (33.3)
Tertiary	95 (46.6)
Occupation	
Un-employed	124 (60.8)

Trader	11 (5.4)
Civil servant	69 (33.8)
Marital Status	
Married	174 (85.3)
Single	6 (2.9)
Divorce	14 (6.9)
Widow	10 (4.9)

4.2. Socio-demographic Characteristics of Index Child

Majority of the respondents had between 1- 4 children 134 (70.1%), with median and range number of children being 4 and 7 respectively. Most of the children were delivered in general hospitals 67 (32.8%). The index children are predominantly females 106 (52.0%), and majority of the index children are between 12-17 months (82.4%) with mean and standard deviation of 14.9 $\pm$ 2.8.

Table 2: Socio-demographic Characteristics of Index Child

Variable	Frequency/Percentage
Age (Months)	
12- 17	168 (82.4)
18 -23	36 (17.6)
Mean ± SD = 14.9 ± 2.8	
Sex	
Male	98 (48.0)
Female	106 (52.0)
Place of delivery of Index Child	
Home	22 (10.8)
PHC Center	64 (31.4)
General Hospital	67 (32.8)
Teaching Hospital	51 (25.0)
No of Children born	
1 – 4	143 (70.1)
5 – 8	61 (29.9)
Median and Range 4 (7)	

4.3 Immunization Status of 12-23 months old in Fagge.

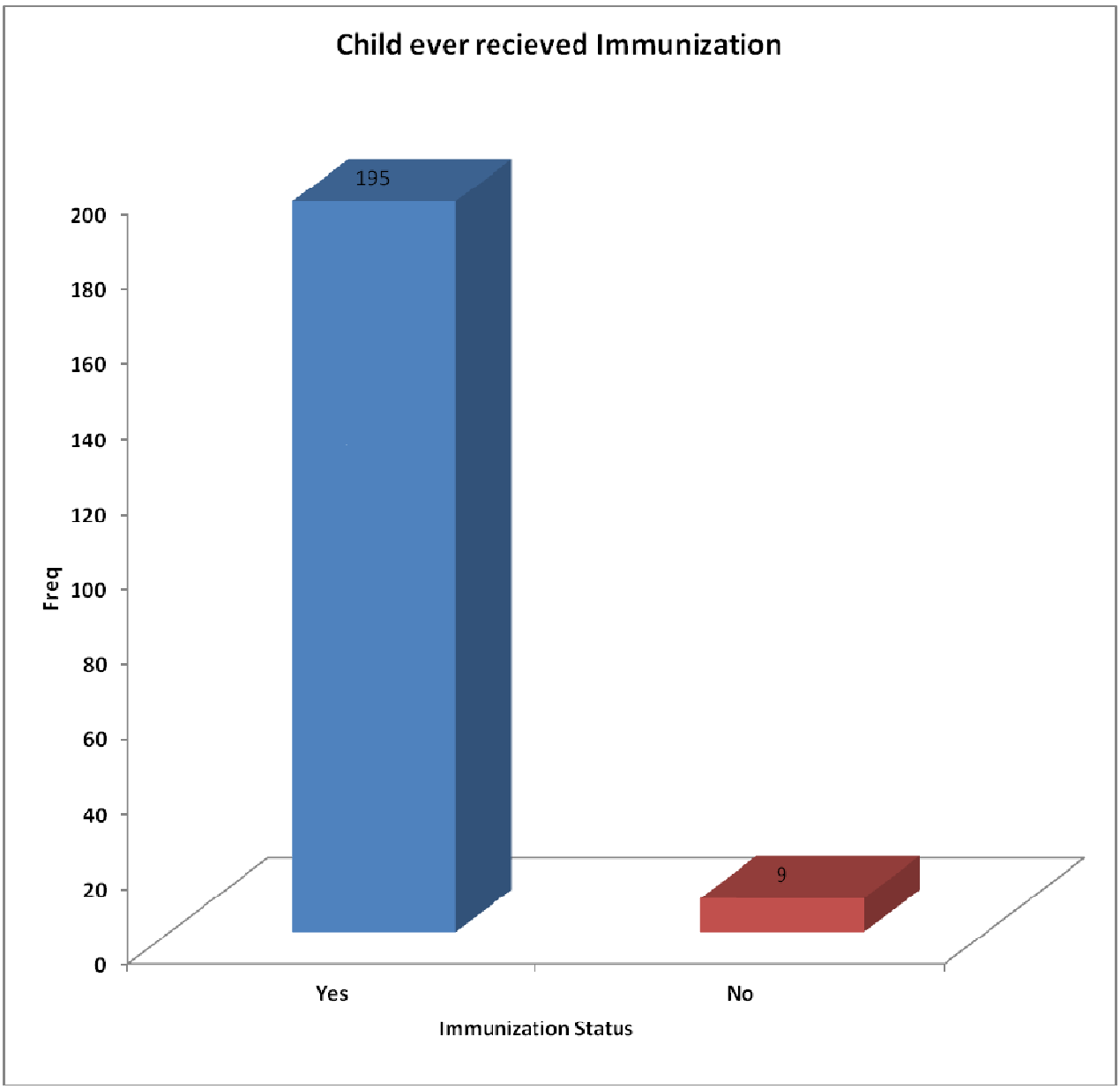


Fig 1 above shows that majority of the respondents said their child had received a form of vaccine either during campaign or in the health facility.

Availability of immunization card

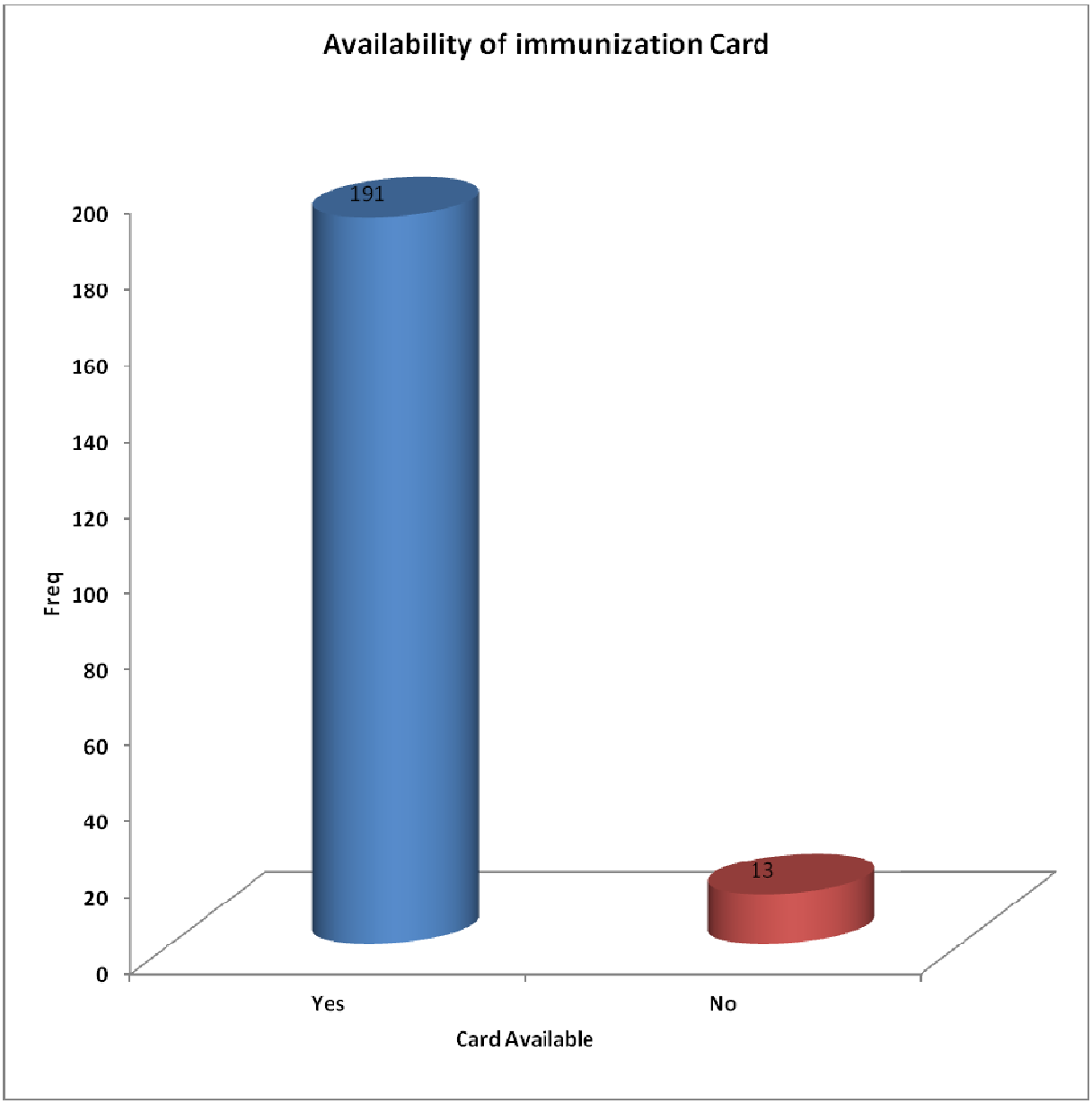


Figure 2 above shows that majority of the respondents presented immunization card of their child when asked.

4.4 Knowledge of Mothers and Care givers on Childhood Immunization

Table 3- Respondents' Knowledge of Childhood Immunization

Knowledge of Childhood Immunization (n = 204)	**Yes**	**No**
Ever Heard of Routine Immunization	196 (96.1%)	8 (3.9%)
What Diseases can a child be immunize against	112 (54.9%)	92 (45.1%)
Age at which child should receive first Immunization	131 (64.2%)	73 (35.8%)
Age at which child should complete Immunization	179 (87.7%)	25 (12.3%)
No of visits for a child to complete Immunization	176 (86.3%)	28 (13.7%)

Table 4 above shows that majority of the respondents had ever heard of Immunization 196 (96.1%) as compared to only 8 (3.9%) who did not. However, the respondents knowledge about the age at which a child should receive first immunization and the age at which a child should complete his immunization were lower at 131 (64.2%) and 179 (87.7%) respectively.

Table -4 Respondents' Aggregate Knowledge of Childhood Immunization

Knowledge of Immunization (n = 170)	**Frequency/Percentage**
• Poor	86 (42.2%)
• Good	48 (23.5%)
• Excellent	70 (34.3%)

Table -4 above shows aggregate knowledge of immunization among respondents. Almost half of the respondents 86 (42.2% had poor knowledge of childhood immunization as compared to 70 (34.3%) of respondents who had excellent knowledge of childhood immunization.

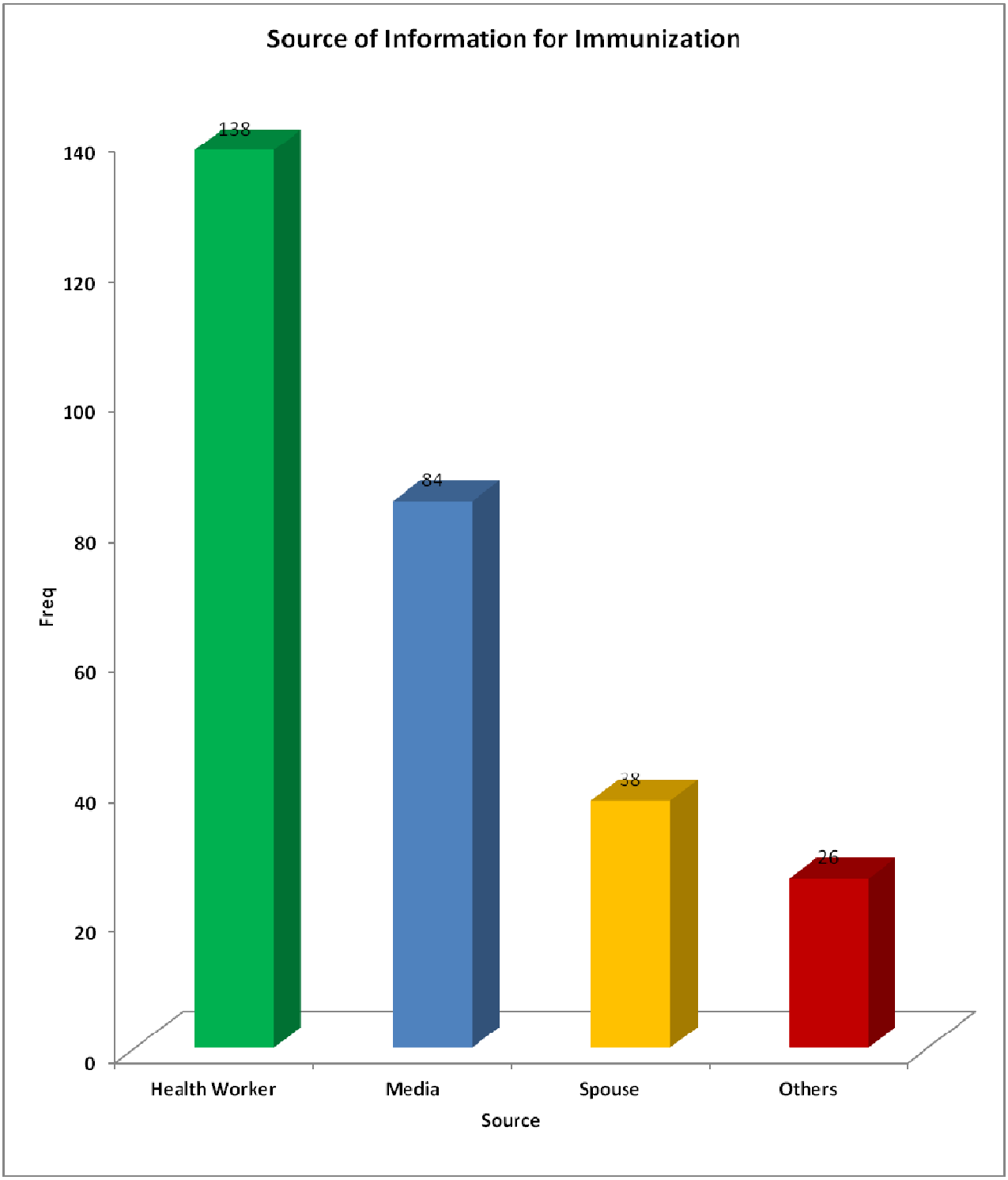

Source of Information for Immunization
138
84
38
26
140
120
100
80
60
40
20
0
Freq
Health Worker
Media
Spouse
Others
Source

Figure 3- Above shows that majority of respondents knows about immunization from Health workers followed by the Media.

4.5 Attitudes of Mothers and Care Givers on Childhood Immunization

Table -5 Respondents Attitudes toward Childhood Immunization

Respondents attitudes towards immunization (n = 204)	**Yes**	**No**
Immunization protect against vaccine preventable Diseases	188 (92.2%)	16 (7.8%)
Immunization of children is optional	64 (31.4%)	140 (68.6%)
Immunization personnel's are friendly	137 (67.2%)	67 (32.8%)
Waiting time during immunization is acceptable	200 (98.0%)	4 (2.0%)
Frequency of immunization visit is appropriate	158(77.5%)	46 (22.5%)

Table 6 above shows that up to 188 (92.2%) of respondents think that immunization protect children against vaccine preventable diseases as compared to 16 (7.8%) who think it does not. However, only 64 (31.4%) of the respondents think that immunization of children is optional as compare to 140(68.6%) of respondents who think that immunization of children is not optional, rather compulsory for all care givers.

Table -6 Respondents' Aggregate Attitudes towards Childhood Immunization

Attitudes toward Immunization (n = 204)	**Frequency/Percentage**
• Poor	19 (9.3%)
• Good	185 (90.7%)

Table -7 above shows aggregate attitudes towards immunization among respondents was generally good. Majority of the respondents 185 (90.7%) had good attitudes towards childhood immunization as compared to 19 (9.3%) of respondents who had poor attitudes towards childhood immunization.

4.6 Respondents' Perception aboutChildhood Immunization

Table -7 Respondents Perception on Childhood Immunization

Perception on Childhood Immunization (n = 204)	**Yes**	**No**
Are Birth certificates Mandatory for Immunization	121 (59.3%)	83 (40.7%)
Risk of Adverse effects outweigh Benefits	35 (17.2%)	169 (82.8%)
A sick child can be Immunized	18 (8.8%)	186 (91.2%)
Are there alternative to immunization	88 (43.1%)	116 (56.9%)

Table 6 above shows that up to 121 (59.1%) of respondents perceived that birth certificates are mandatory for their child to be immunized. However, only 18 (8.8%) of the respondents think that a sick child can be immunized as compare to 186 (91.2%) of respondents who think that a sick child should not be immunized.

Table -8 Respondents' Aggregate Perception on Childhood Immunization

Knowledge of Immunization (n = 170)	**Frequency/Percentage**
• Poor	116 (56.9%)
• Good	88 (43.1%)

Table -8 above shows aggregate perception on immunization among respondents. More than half of the respondents 116 (56.9%) had poor perception on childhood immunization as compared to 88 (43.1%) of respondents who had good perception regarding childhood immunization.

4.6 Challenges associated with uptake of Childhood Immunization

Table 9: Reasons for rejecting immunization

Respondents reasons for Rejecting Immunization	Yes	No
Immunization is Harmful	33 (16.2%)	171 (83.8%)
Immunization reduces fertility	73 (35.8%)	131 (64.2%)
Father refused to allow	39 (19.1%)	165 (80.9%)
Immunization is against religion/culture	59 (28.9%)	145 (71.1%)

[

Table – shows that majority of respondents belief that immunization reduces fertility of the child later in life 73 (35.8%) followed by those who immunization is against their religion and culture 59 (28.9%).

4.7 Results of Focus Group Discussions

4.7.1 Attitude of community towards immunization

Most participants mentioned that immunization is good for their children because it preventsthem from some diseases so they accept it for their children. A male discussant said "*I think immunization for their children has no alternatives".*

4.7.2 What informs this attitude?

Some of the discussants said the health workers are well behaved and friendly. One of the discussant said "*their time is not wasted in the immunization Centre*". *Whileother mentioned that" the immunization visiting days do not stop them from the normal routine of work".*

4.7.3 The roles of political and traditional leaders played towards encouraging mothers to all their children immunized.

"*Our traditional leaders always encourage our husbands to allow and support us for children's immunization*". Said a discussant.

Second discussant said, "*Indeed our traditional leaders do send their messenger a day before immunization day to come and remind us of the day*".

Third discussant said, "*The information about immunization we are getting from radio and television were being sponsored by our politician*"

Other discussants said "*The new immunization centre was built by one of the politicians*".

4.7.4 Doyou belief male head of households encourage childhood immunization?

Most of the discussants said they happy with the support and encourage their male head of households gave them concerning childhood immunization. One of the discussant said, "*I don't belief in immunization and warn my wife not to give my children any immunization"*

4.7.5 Shortcomings observed from health workers during immunization.

All discussants said occasional absence of vaccines and syringes are some of the shortcomings.

CHAPTER FIVE:

DISCUSSION

Majority of the respondents in the study were between the ages of 26-35years (47.6%) with mean and standard deviation of 28.8 ± 6.5 years. This may be associated with age of married in the study area. The respondents were also predominantly Muslim and Hausa Fulani, 187 (91.7%) and 154 (75.5%) respectively, which is in line with the religious and cultural peculiarities of the study area. Although majority of respondents had tertiary education 95 (46.6%), but up to 174 (85.3%) were un-employed. Similarly majority of the respondents are married 174 (85.3%). This is because only married women are expected to bear children in the study area.

Majority of the respondents had between 1- 4 children 134 (70.1%), with median and range number of children being 4 and 7 respectively. This is similar to finding of a report of facility assessment by Family Health international (FHI 360) in the state. [39] Most of the children were delivered in general hospitals 67 (32.8%). The index children are predominantly females 106 (52.0%), and majority of the index children are between 12-17 months (82.4%) with mean and standard deviation of 14.9 ± 2.8.

The immunization status of the children also reveal that majority of the children have had some form of vaccination. This was done either at home during campaign or in the health facilities. This may be as result of several immunization campaigns conducted over the years in the form of immunization plus days because Kano was one of the remaining state with wild polio various. Similarly the majority of the respondents also presented immunization cards of their index child when asked. This high availability of immunization cards may be as result of pluses given to

mothers and care givers especially long lasting insecticide treated bet nets for all those with immunization cards.

The knowledge of care givers towards childhood immunization was also found to be fairly good. Up to 34.3% (70) of the respondents had excellent knowledge followed by 23.5% (48) that had good knowledge. Only 42.2% (86) had poor knowledge.

The proportion of the women (55%) who correctly identified the diseases against which the child is immunized in this study is high compared to a study in Pakistan [18], similar result was obtained in a study in Lagos and this could be attributed to high proportion of the women (79.9%) that had post primary education. This higher literacy level of the responds is similar to a study India [19]. Studies in Tanzania and Ethiopia have demonstrated similar findings[20]. The proportion of informed women about routine immunization in this study is high compared to a study in Lagos [22] and this may not be unrelated to higher literacy level of the responds in this study. The source of their information from the study show that health worker constitute about 56% which is similar to study done some where[19].The study shows that higher proportion of the respondents (92.2%) agreed that immunization protect children against vaccine preventable diseases compared to study in Pakistan [18]and majority (61.3%) believe immunization is not optional which similar to study done in Ethiopia [21]. The good knowledge and attitude of the respondents' immunization could be due to their friendly with immunization personnel (67.2%). The study also shows that high proportion of the respondent (97.5%) agreed that the waiting time for immunization is acceptable which is higher compare to a study done in Kenya [36.] The health-seeking behaviour of the mothers/caregiver is commendable has shown by their knowledge of immunization visits appropriate for a child to be fully immunization (77%) in this study and this

similar to study in Lagos, Ethiopia and Kenya [21,22,36]. The respondents' attitude toward routine immunization shown by high proportions that have their children immunization card (93.6%) is similar to other studies done elsewhere [28]. The reasons adduced from this study for not immunizing children are: believe that immunization reduces fertility in children (35.5%), vaccination is against religion/cultural values (28.9%), father does not allow (19.1%) and immunization is harmful (18.7%) and these similar studies done in Nigeria and India [22, 28 33]. The immunization coverage from this study using the number of respondents that have immunization cards is estimated to 82% which is close to WHO global vaccine coverage report for 2013 though this is higher for Kano state compare the NDHS report of 2013. The validity value for HBV which similar to other antigens in the study is 79% which shows that using immunization card to assess immunization uptake is highly sensitive.

CHAPTER SIX:

CONCLUSION AND RECOMMENDATIONS

CONCLUSION:

Most mothers studied had good knowledge and positive perception and practice of immunization. Similarly, the proportions of mothers with wrong knowledge and poor perception of immunization require policy attention. Maternal education was significantly associated with knowledge and acceptance of immunization. These findings are important in the design and implementation of childhood immunization programmes. More attention should be directed at better understanding of perception, practices and beliefs of mothers on childhood immunization. Measures such as female education, adult literacy programmes, health education campaigns and new or improved immunization campaigns delivery methods should be considered for raising immunization coverage in Nigeria.

RECOMMENDATIONS:

The result of the study showed that knowledge and perception of mothers was related to children immunization status because many variables of knowledge and perception were link with children completeness of immunization. Therefore every health workers should work closely together and educate mothers for improvement of their knowledge and their vision perception about health promotion and prevention, especially for disease prevention by vaccines, it's cost effectiveness and benefits. Knowledge and perception of mothers are very important to their children's immunization status, the government has to emphasize on health education, and especially IEC material it's very important for educating people.

Strengthen the community participation and multi-sector approach on immunization programs.

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APPENDIX 4

CONSENT FORM

I am Dr. Bello Emmanuel Toyin, a student of Master in Public Health, conducting a study to assess Childhood Immunization and Related Knowledge, Perception and Attitude of Mothers of 12-23 months old children in Fagge L.G.A.

The General Aim is to determine Childhood Immunization Coverage and related knowledge, perception and Attitude of Mothers in Fagge L.G.A Kano State.

As a participant, I would request that you respond to the research questionnaire which may take 30 minutes. If you agree to participate, kindly sign in the space provided below. Participation is entirely voluntary. Refusal to participate will not affect you in any manner.

Thank you.

Name of Participant …….. Sign/Thumb print……..

Yours faithfully,

Dr. Bello E. Toyin

BAYERO UNIVERSITY KANO

DEPARTMENT OF COMMUNITY MEDICINE

PROJECT QUESTIONNAIRE

Childhood immunization and related knowledge perception and attitude of mothers of 12-23 months old children in Fagge LGA

SECTION A: SOCIO DEMOGRAPHIC PROFILE OF RESPONDENTS

1. Age of mother/caregiver (yrs):…….
2. Religion: (a) Islam ☐ (b) Christianity ☐ (c) other ☐
3. Ethnicity: (a). Hausa/Fulani ☐ b. Yoruba ☐ c. Igbo ☐
   d. other ☐
4. Educational status: (a) Qur'anic only ☐ (b) primary ☐
   (c) secondary ☐ (d)tertiary ☐
5. Occupation: (a) trader ☐ (b) civil servant ☐ (c) house ☐
   (d) student ☐ (e) other (specify)…….
6. Marital status: (a) married ☐ (b) single ☐ (c) divorced ☐
   (d) widow ☐
7. Number of children born by the mother:……..
8. Age index child (youngest)…….
9. Sex of index child: (a) male ☐ (b) female ☐
10 Place of delivery of the child:(a) at home ☐ (b) P.H.C ☐
   (c) general hospital ☐ (d) teaching hospital ☐

SECTION B: MOTHER'S KNOWLEDGE OF CHILDHOOD IMMUNIZATION

11 Have you ever hear of routine childhood immunization?
   (a) yes ☐ (b) No ☐

12 If yes, what is your source of information? (a)Electronic/print media ☐
(b) spouse ☐ (c) health worker ☐ (d) friends/relatives ☐
(e) others ☐

13 Against which of the following diseases can a child be immunized?
(a) tuberculosis ☐ (b) diphtheria ☐ (c) pertussis ☐
(d) tetanus ☐ (e) Polomyelitis ☐ (f) yellow fever ☐
(g) Hepatitis ☐ (h) other ☐

14 At what age should a child receiving immunization?
(a) immediately after birth ☐ (b) two weeks after birth ☐
(c) after weaning ☐ d. when the child have started walking ☐
(e) 40 days after birth (post partum) ☐

15 At what age should a child complete immunization?
(a) seven months ☐ (b) nine months ☐ (c) one year ☐
(d) two years ☐ (e) three years ☐ (f) other (specify)…….

16 How much time should a child visit immunization center for him/her to complete his/her immunization course? (a) one ☐ (b)two ☐
(c)three ☐ (d) four ☐ (e) five ☐ (f)don't know ☐

SECTION C: MOTHER'S PERCEPTION ABOUT IMMUNIZATION

Answer the following by indicating true or false or don't know

17. Are birth certificates mandatory before immunization?
18. Does the risk of adverse effect outweigh the benefit of immunization?
19. Sick children should be immunized?
20. There are other alternatives to immunization.

SECTION D:MOTHER'S ATTITUDE TOWARDS CHILDHOOD IMMUNIZATION

Answer the following by indicating agree undecided or disagree

21. Immunization protects children against vaccine preventable diseases
22. Immunization is optional
23. Immunization personnel are friendly
24. The waiting time for immunization is acceptable.
25. The frequency of immunization visits is appropriate.

SECTION E: IMMUNIZATION STATUS OF 12 – 23 MONTHS CHILDREN.

26. How old is your index child ……. in months
27. Have your index child been vaccinated Yes ☐ No ☐
28. Do you have an immunization card *Yes* ☐ *No* ☐
29. If the answers to question 27 and 28 are yes, vaccination cards are checked (to confirm these assertions

At birth	BCG $0PV_O$
At 6 weeks of age	OPV_1 penta1
At 10 weeks of age	OPV_2 penta2
At 14 weeks of age	OPV_3 penta3
At 9 months of age	Measles Yellow fever

30. If the index child is vaccinated but has no immunization card, the mother is asked to recall the age of the child when the various vaccines where administered.

Age of child in months when vaccinated…….. BCG OPV_0

‘’ ‘’ ‘’ ‘’ ‘’ ‘’ ‘’ …… OPV_1 penta1

‘’ ‘’ ‘’ ‘’ ‘’ ‘’ ‘’

‘’ ‘’ ‘’ ‘’ ‘’ ‘’ ‘’

…….OPV_2

penta2

……OPV_3

penta3

Measles Yellow

fever

31. Did you observe any side effect of immunization after the vaccination? Yes No

32. If yes, what are these side effect?

a) Fever b) rashes c) collapse d) death e) others (specify)

33. If a child has never been vaccinated, what are the reasons mothers/care givers reject vaccination

a) Immunization is harmful
b) Immunization reduces fertility in children as they grow up
c) Father does not allow child immunization
d) Is against religion/cultural values