EXPLORING STRATEGIES TO IMPROVE ADHERENCE TO IMMUNIZATION SCHEDULE AMONG CHILDREN ATTENDING THE MATERNAL AND CHILD HEALTH CLINIC AT KENYATTA NATIONAL HOSPITAL

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A THESIS IS SUBMITTED IN PARTIAL FULFILLMENT FOR THE REQUIREMENT OF THE DEGREE OF MASTER OF SCIENCE IN NURSING (PEDIATRIC) OF THE UNIVERSITY OF NAIROBI

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DECLARATION

I, Esther C Muathe, declare that this thesis is my original work and that it has not been presented in any institution for an academic or any other award.

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CERTIFICATE OF APPROVAL

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DEDICATION

I dedicate this work to my husband Benjamin Muathe and our children Tony, Everlyne, Betty and Lewis for their constant support, love and patience throughout the study period.

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Table of Contents

DECLARATION ..... **I**

CERTIFICATE OF APPROVAL ..... **II**

DEDICATION ..... **III**

ACKNOWLEDGEMENT ..... **IV**

LIST OF TABLES ..... **IX**

LIST OF FIGURES ..... **X**

LIST OF ABBREVIATIONS ..... **XI**

OPERATIONAL DEFINITIONS ..... **XII**

ABSTRACT ..... **XIII**

CHAPTER ONE: INTRODUCTION ..... **XIII**

1.1BACKGROUND INFORMATION 1

1.2 PROBLEM STATEMENT 2

1.3 RESEARCH QUESTIONS 4

1.4 BROAD OBJECTIVE 4

1.5 SPECIFIC OBJECTIVES 4

1.6 JUSTIFICATION 5

CHAPTER TWO: LITERATURE REVIEW **6**

2.1 INTRODUCTION 6

2.1.1 IMMUNIZATION SCHEDULE FOR KENYA *8*

2.1.2 Prevalence of adherence to immunization schedule among children less than 24 months. *9*

2.2 ENABLING FACTORS OF THE CURRENT STRATEGIES OF IMPROVING ADHERENCE TO IMMUNIZATION SCHEDULE ..9

2.3 BARRIERS TO CURRENT STRATEGIES OF IMPROVING ADHERENCE TO IMMUNIZATION SCHEDULE 10

2.4 STRATEGIES FOCUSING ON THE CARE GIVER TO IMPROVE ADHERENCE TO IMMUNIZATION SCHEDULE 12
2.5 STRATEGIES FOCUSING ON THE HEALTH SYSTEM TO IMPROVE ADHERENCE TO IMMUNIZATION SCHEDULE 12
2.6: THEORETICAL FRAMEWORK 14
2.7: CONCEPTUAL FRAMEWORK 16
CHAPTER THREE: METHODOLOGY 17
3.1 STUDY DESIGN AND RATIONALE 17
3.2 STUDY AREA 17
3.3 STUDY POPULATION 18
3.3.1Inclusion criteria 18
3.3.2 Exclusion criteria 19
3.3.3 Eligibility criteria for nurses 19
3.4 STUDY SAMPLE SIZE DETERMINATION 19
3.5 SAMPLING METHOD 20
3.6 RECRUITMENT AND TRAINING OF RESEARCH ASSISTANTS 21
3.7 STUDY INSTRUMENTS 21
3.7.1 Data collection tool: Quantitative data 21
3.7.2 Qualitative data collection tools 22
3.8PROCEDURES FOR DATA COLLECTION 22
3.8.1 Pretesting of study instrument 22
3.8.2 Recruitment and enrolment of study participants 23
3.8.3 Interview procedure (Data collection) 23
3.9 DATA MANAGEMENT AND ANALYSIS 24
3.9.1 Quantitative data 24
3.9.2Qualitative data 24
3.10 DATA PRESENTATION AND DISSEMINATION PLAN 25
3.11ETHICAL CONSIDERATIONS 25
3.12 STUDY ASSUMPTIONS 26
3.13 STUDY LIMITATIONS 26

CHAPTER FOUR: STUDY RESULTS 27

4.1: INTRODUCTION 27

4.2 CAREGIVER/ CHILD SOCIAL- DEMOGRAPHIC CHARACTERISTICS 27

4.2.1 Caregiver social demographic characteristics 27

4.3: RELATIONSHIP BETWEEN CARE GIVER SOCIAL DEMOGRAPHICS AND ADHERENCE TO IMMUNIZATION STATUS 29

4.4: DETERMINANTS OF ADHERENCE TO IMMUNIZATION SCHEDULE 30

4.5: CHILD DEMOGRAPHICS 31

4.5.1: Social demographics of the children 31

4.6 GROSS FAMILY INCOME 32

4.7 TIME TAKEN TO REACH HEALTH FACILITY 33

4.8: AMOUNT OF BUS FARE USED 33

4.9: CHILD IMMUNIZATION STATUS 34

4.10: ENABLING FACTORS OF THE EXISTING STRATEGIES OF IMPROVING ADHERENCE TO IMMUNIZATION SCHEDULE 35

4.11: BARRIERS OF CURRENT STRATEGIES OF IMPROVING ADHERENCE TO IMMUNIZATION SCHEDULE 37

4.12: FEASIBLE STRATEGIES FOCUSING ON THE CARE GIVER THAT WILL IMPROVE ADHERENCE TO IMMUNIZATION SCHEDULE 39

4.13: ACHIEVABLE STRATEGIES FOCUSING ON THE HEALTH SYSTEM THAT WILL IMPROVE ADHERENCE TO IMMUNIZATION SCHEDULE 40

4.14: IMMUNIZATION STATUS OF THE CHILD 41

4.15 FACTORS AFFECTING IMMUNIZATION STATUS OF CHILDREN 42

4.16: REASON FOR MISSED SCHEDULE 43

CHAPTER FIVE 45

5.1: DISCUSSION 45

5.1.1 Introduction 45

5.1.2 Characteristics of the study population 45

5.1.3: Enabling Factors of the current strategies of improving adherence to immunization schedule 47

5.1.4: Barriers to current strategies of improving adherence to immunization schedule *47*

5.1.5: Feasible strategies focusing on the care giver that will improve adherence to immunization schedule ..*48*

5.1.6: Achievable strategies focusing on the Health system that will improve adherence to immunization schedule *49*

5.1.7: Association between the care giver's socio-demographics and non- adherence to immunization schedule *50*

5.2: CONCLUSION 51

5.3: RECOMMENDATIONS 53

5.3.1: RECOMMENDATIONS *53*

5.3.2: RECOMMENDATIONS FOR FURTHER RESEARCH *53*

APPENDICES 58

APPENDIX 1: WORK PLAN 58

APPENDIX 2: BUDGET 59

APPENDIX 3A: PARTICIPANT/ CARETAKER INFORMATION SHEET 60

KIAMBATISHO 3B: FOMU YA MAELEZO KUHUSU IDHINI 62

APPENDIX 3C: PARTICIPANT/ PARENT INFORMED CONSENT 64

KIAMBATISHO 3D: FOMU YA KUTOA IDHINI KUSHIRIKI 65

APPPENDIX 3E: PARTICIPANTS FOCUSED GROUP DISCUSSION CONSENT FORM 66

APPENDIX 4A: STUDY QUESTIONNAIRE 68

KIAMBATISHO 4B: JARIDA LA MASWALI 73

APPENDIX 4C: FOCUSED GROUP DISCUSSION GUIDE 78

APPENDIX 4D: KEY INFORMANT INTERVIEW GUIDE 80

APPENDIX 5: REQUEST FOR APPROVAL TO CARRY OUT STUDY 82

APPENDIX 6: REQUEST FOR PERMISSION TO CARRY OUT STUDY 83

APPENDIX 7: KNH/UON-ERC APPROVAL 84

APPENDIX 8: STUDY REGISTRATION CERTIFICATE 86

APPENDIX 9: AUTHORITY TO COLLECT DATA 87

APPENDIX 10: MAP OF KENYATTA NATIONAL HOSPITAL 88

LIST OF TABLES

Table 4. 1Caregiver's Social Demographic characteristics 28

Table 4. 2 Social demographic characteristics of caregivers and non- adherence to immunization schedule 30

Table 4. 3 Determinants of adherence to immunization schedule 31

Table 4. 4 Child demographics 32

Table 4. 5 Child Immunization Status 35

Table 4. 6 Distribution of codes 37

LIST OF FIGURES

Figure 4. 1Income level 33

Figure 4. 2Time taken to reach health facility 33

Figure 4. 3Amount of bus fare used to and from the clinic 34

Figure 4. 4 Enabling factors to the existing strategies of improving adherence to immunization schedule 36

Figure 4. 5 : Distribution of codes 37

Figure 4. 6 Barriers of current strategies of improving adherence to immunization schedule 39

Figure 4. 7 Strategies focusing on care giver that will improve adherence to immunization schedule 40

Figure 4. 8 strategies focusing on the Health system that will improve adherence to immunization schedule. 41

Figure 4. 9 Immunization status of children 42

Figure 4. 10 Factors affecting immunization status of the child 43

Figure 4. 11 Reason for missed schedule 44

LIST OF ABBREVIATIONS

BCG	Bacillus Calmette - Guerin
DVI	Division of Vaccines and Immunizations
DPT	Diphtheria, Pertussis, and Tetanus
ERC	Ethics and research committee
FGD	Focused group discussion
GAVI	Global Alliance Vaccines Initiative
HepB	Hepatitis B
Hib	Haemophilus influenza type B
IPV	Inactivated Polio Vaccine
KDHS	Kenya Demographic and Health Survey
KEPI	Kenya Expanded Programmes on Immunization
KNH	Kenyatta National Teaching and Referral Hospital
KPI	Key person interviews
SDGs	Sustainable development goals
NVIP	National Vaccines and Immunizations Programmes
OPV	Oral Polio Vaccine
PCV	Pneumococcal conjugate vaccine
Penta	Pentavalent
TB	Tuberculosis
TT	Tetanus Toxoid

OPERATIONAL DEFINITIONS

Complete (full) immunization - The childhood immunization status once a child has received all recommended vaccines, including BCG, three doses of pentavalent, three doses of polio and measles vaccines by the age of 12 months.

Immunization- A method of stimulating resistance in the human body to specific diseases using Micro-organisms; bacteria or viruses that have been modified or killed.

Immunization adherence- completeness and timeliness towards different vaccines of childhood immunization

Immunization dropout- A child who has received at least one dose of pentavalent vaccine, but failed to receive his or her third dose of pentavalent or failed to receive measles vaccine to complete the schedule before twelve months of age.

Immunization dropout rate - The proportion of children that received at least one dose or type of vaccine within the recommended immunization schedule but have failed to receive the remaining doses or types of vaccines to complete the recommended schedule.

Immunization Schedule –A series of vaccinations, including the timing of all doses.

Incomplete (partial) immunization/Defaulter - The childhood immunization status if the child missed at least one of the recommended vaccines.

Non-adherence to immunization schedule–Not getting immunizations as timely as per the recommended immunization schedule or not completing (partial) the vaccinations as recommended.

Vaccines- Biological preparations that improve immunity to a particular disease.

Abstract

Background: Globally, immunization is among the major contributors to public health. It prevents 20% of childhood mortality annually. The highest fatality rates from vaccine preventable diseases are usually among children under five. Despite immunization guidelines put in place by the World Health Organization (WHO), 1.5 million children die globally on annual basis due to inadequate vaccination coverage. Existing literature indicate there is an increase in non-adherence to immunization schedule in developing countries and therefore an increased demand to improve adherence to immunization schedule. The Kenya Demographic and health Survey 2014 documented Kenya vaccination coverage for infants as 76%. Improving immunization adherence is an important measure in reducing morbidity and mortality from childhood immunizable diseases.

Objective: To explore strategies that will improve adherence to immunization schedule among children under 24 months attending Maternal and Child Health (MCH) clinic at Kenyatta National Hospital (KNH).

Method: Cross- sectional mixed methods research was used in the study. The study was carried out at the MCH clinic in KNH and the target population was all children under 24 months of age and their care givers. A total of 214 participants were selected by simple random sampling method and data collection was by researcher administered semi- structured questionnaire. Qualitative data was collected using two Focused group discussions (FGD) each with 10 care givers who had not been subjected to the questionnaire and key person interviews (KPI) with two nurses in MCH to obtain in- depth qualitative information on their views on ways of improving adherence to immunization schedule. Qualitative data was audio- taped.

Data was analyzed by the use SPSS V20 by use of descriptive and inferential statistics. Significance between variables was established by the use of Chi square test. Data was presented in tables, bar graphs and pie charts. Qualitative data was transcribed, translated and analyzed manually by listening to the audio tapes.

Results: Majority of the children 195(92.0%) were brought by their mothers. Among the study participants, (47.9%) were aged between 26-30years. 86.6percent were married while 56.1% had attained education level beyond secondary school. In occupation, 0.5% of the care givers were unemployed while the majority were earning above Ksh.40, 000 per month. Out of 214 participants, 141(66.8%) of them reported that their children have ever missed immunizations on the scheduled date. These main barriers to adherence to immunization schedule as found in the study were: lack of bus fare, care taker had travelled, care taker at work, getting late to the clinic, home far from health facility and baby's sickness. Strategies that would improve immunization schedule as found in the study were flexible clinic hours, phone call reminders, phone alarms and putting more health facilities near residential areas.

Conclusion: Marital status, educational level and occupation determined adherence to immunization schedule. Health systems' factors such as rigid clinic hours, long distance to health facility and lack of strategies to follow-up caregivers or remind them on due date influence non-adherence to immunization schedule

CHAPTER ONE: INTRODUCTION

1.1BACKGROUND INFORMATION

Childhood vaccination is one among the many contributors of major global reductions in morbidity and mortality resulting from vaccine preventable diseases. It is an important intervention with an aim of reducing childhood morbidity and mortality as indicated in the Sustainable Development Goals (UNDP, 2015). It is estimated by the World Health Organization (WHO) and the United Nations Children's Emergency Fund (UNICEF) that 1.5 million children worldwide die from vaccine-preventable diseases annually(Moubassira, 2017).This is caused by inadequate vaccination coverage. Sub-Saharan Africa (SSA) and South-East Asia contribute to the highest percentage of these deaths (Moubassira, 2017). WHO made an effort to reduce childhood morbidity and mortality by developing immunization guidelines which were adopted by Kenya by developing National guidelines on immunizations (MOH, 2013).

Immunization prevents an estimate of two to three million deaths resulting from life- threatening diseases among the under-fives annually (WHO, 2018). Immunization has been made accessible to all the populations because it can be delivered through outreach activities(WHO, 2018).Adherence to laid down vaccination schedules can significantly reduce the prevalence of vaccine-preventable diseases in children (Albarrak, 2016).

There are several childhood immunizable diseases and among them are: Tuberculosis, Poliomyelitis, Diphtheria, Whooping cough, Tetanus, Pneumonia and Measles. Others are Influenza, Rotavirus among others. The Kenya Expanded Programme on Immunization (KEPI) was established in 1980 by the Ministry of Health (MOH) with an aim of immunizing children against the initial six under-five killer diseases which are tuberculosis, polio, diphtheria, whooping

cough, tetanus and measles to all children in the country before their first birthday. Over the years, more vaccines have been developed to provide immunity against Hepatitis B, Haemophilus Influenza type B, Pneumonia, Rotavirus, Mumps and Rubella (MOH, 2013).

In Kenya, childhood immunization follows the Ministry of Health, National Vaccines and Immunizations Programmes (NVIP) Immunization schedule (MOH, 2013).This department was initially known as Kenya Expanded Programme on Immunization (KEPI) which changed to department of vaccines and Immunizations (DVI) then to The Unit of Vaccines and Immunizations services (UVIS) and currently to National Vaccines and Immunizations Programmes (NVIP).

In a study done in Ethiopia in 2016, the main reason for non-adherence to immunization schedule was inadequate care giver counseling leading to scanty information about vaccination schedules. Others were relationships between the health care providers and the clients which do not support information sharing, poor arrangement of immunization services and lack of defaulter tracing systems (Asamnew, 2016).

1.2 Problem Statement

There is a significant progress in development of effective national immunization programmes. This success has been contributed by World Health Organization, United Nations Children's Emergency Fund (UNICEF), and Global Alliance Vaccine Initiative (GAVI) (Barvos, 2016).Childhood vaccination is one of the most cost effective interventions that prevent two to three million deaths every year from childhood immunizable diseases (WHO, 2018).WHO and UNICEF estimate that in 2016, 12.9 million infants did not receive any vaccinations and this exposes them to fatal diseases (WHO, 2017).

The Government of Kenya has made efforts to improve immunization coverage. However, adherence to immunization schedule has a gap. According to the immunization permanent register MOH 510 in the Maternal and Child Health clinic, KNH, some care givers take their children to the clinic weeks after the due date and others fail completely to take their children for immunization (Immunization Permanent Register MOH 510,2017).According to the Kenya National Bureau of statistics(2017), there was a decline in the number of fully immunized children from 1,113,188 in 2015 to 1,103,608 in 2016 (KNBS, 2017).

There is still a high vaccination dropout rate. Research has shown that in Kenya, the dropout rate before receiving the third dose of pentavalent was 10-33% in 2011 (AdamHaji, 2014). According to Kenya Demographic and Health Survey2014, the proportion of children who received all basic immunizations was 79%. Data from District Health Information system (DHIS) show that Proportion of fully immunized children dropped from 72.4% in 2016 to 65.7% in 2017 (DHIS, 2017). The same data show that in 2016, there was a drop out in the proportion of children who received Penta 1 compared to those who received Penta 3(83.5 % to 78.3%). Drop out from Penta 1 to Measles /Rubella in the same year was 83.8% to 74.7%. In 2017, the drop out worsened with those receiving Penta 1 (76%) dropping to 68.3% for Penta3 and to 58.5% for Measles/ Rubella (DHIS, 2017).

According to available data in the Maternal and Child health clinic in KNH, 77 percent of children complete their immunizations (are fully immunized). Out of these, only 65 percent are timely (come on the scheduled date) for immunization. Among the children who were seen between November 2016 and November 2017, 23% dropped out after the six or ten weeks' immunization (defaulters).These children are only captured during health history taking when they become ill and admitted in hospital. This drop out is a consequence of non-adherence to immunization which

leads to reduced immunization coverage and increased risk of disease outbreaks. Some strategies which are already in place to improve adherence have not been effective in eliminating these incidences. The proportion of children who are not fully immunized can have a negative effect on all strategies put forth to prevent morbidity and mortality from childhood immunizable diseases.

1.3 Research questions

i. What are the enabling factors of the current strategies of improving adherence to immunization schedule?

ii. What are the barriers of current strategies of improving adherence to immunization schedule?

iii. What are the caregiver strategies that will improve adherence to immunization schedule?

iv. What are the Health system strategies that will improve adherence to immunization schedule?

1.4 Broad Objective

To explore strategies that will improve adherence to immunization schedule among children under 24 months attending Maternal and child health clinic at Kenyatta National Teaching and Referral Hospital.

1.5 Specific Objectives

i. To assess enabling factors of the current strategies of improving adherence to immunization schedule

ii. To assess barriers of current strategies of improving adherence to immunization schedule

iii. To determine feasible strategies focusing on the caregiver that would improve adherence to immunization schedule

iv. To determine achievable strategies focusing on the Health system that would improve adherence to immunization schedule

1.6 Justification

Episodes of vaccine preventable diseases are still being encountered in health care settings contributing to under- five mortality rate. A lot of resources have been spent to make sure vaccines are available but we still get morbidity from the vaccine preventable diseases. This has been occasioned by late immunization or missed immunizations. A study done in 2015 in Kenyatta National Hospital on factors influencing immunization drop out among children aged 24 to 60 months revealed lack of awareness by the care givers of immunization schedule.

The Ministry of Health consolidated all vaccination services under one unit called the National vaccines and Immunization Programmes (NVIP). The ministry further developed the policy guidelines on immunizations with an aim of integrating all vaccination programmes and improving. This effort was aimed at improving vaccination services in Kenya (MOH, 2013). The aim of the study was to explore the strategies that can improve adherence to immunization schedule. According to the immunization permanent register MOH 510 in the Maternal and Child Health clinic, KNH, there is a gap in adherence to immunization schedule. The strategies we explored were those focusing on the care giver and health system and also enabling strategies to the current available strategies as well as the barriers to the existing strategies of improving adherence to immunization schedule. This will go a long way towards improvement in adherence, thus improving immunization coverage and consequently benefit the children in reducing morbidity and mortality from vaccine preventable diseases.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

In this chapter, the researcher reviewed the strategies used to improve adherence to immunization schedule. Reduction of the prevalence of vaccine preventable diseases in children can be achieved by adherence to vaccination schedules. Barriers to vaccination compliance exist and some of them are fear of complications following vaccination, lack of awareness of the importance of vaccines and non-adherence to due dates (Albarrak, 2016).It has been shown that approximately twenty seven million infants do not get vaccination against childhood diseases. This lead to the death of two to three million children annually from preventable diseases and illness of many others (Angela, 2010)

The Kenya government being a signatory to the Alma Ata declaration of 1978 established Kenya expanded programme on Immunization (KEPI) under the Ministry of Health. The Ministry provide vaccinations against childhood immunizable diseases to all children under the age of one year and also Tetanus Toxoid vaccination to all pregnant mothers (MOH, 2013).

In a survey carried out in Ethiopia, the full immunization coverage was lower than the national target set of 66 %. Predictors of full immunization coverage were found by the survey to be utilization of health services and access to maternal and child health information. The survey found out that it is important to device appropriate strategies that will enhance health information and accessibility to immunizations by addressing variations among regions (Yihunie Lakew, 2015).

A study done in Bangladesh factors lack of information as a cause to immunization dropout. In this study, dropout rates were heightened by inadequate information about immunization schedule (Latifur Rahman, 2012). In a study done in Gabon on the reason for non – Adherence to

immunizations it was shown that important reason for non-attendance to mother – child clinics (MCC) included transport costs, negative experiences at MCC such as interactions with unfriendly staff (Nobert George, 2009)

In Kenya, National Vaccines and Immunizations Programmes (NVIP) manage the immunization programme. It has been in existence since 1980 when it was established as KEPI. KEPI immunization schedule initially covered only six immunizable diseases; Tuberculosis, poliomyelitis, diphtheria, pertussis, tetanus and measles. Despite these efforts, these diseases still cause death of many children (MOH, 2013). Kenya has introduced several vaccines into the immunization schedule over the last 16 years namely: Pentavalent in 2002, Pneumococcal conjugate vaccine (PCV10) in 2011, Measles second dose in 2013, Rotavirus in 2014 and Inactivated Polio Vaccine (IPV) in 2015 (UVIS, 2015).

2.1.1 IMMUNIZATION SCHEDULE FOR KENYA

The table below shows a summary of Kenya's current immunization schedule for children 0 to 24 months:

Vaccine	**Ages of administration of routine immunization services**	**Dosage and Route of administration**
BCG	At birth or at first contact	0.05 mls- Intra-dermal on the left fore- arm
BIRTH POLIO(OPV 0)	At birth or within 2 weeks	2 drops- Orally
OPV	At 6 , 10 and 14 weeks	2 drops- Orally
DPT-Hep B-Hib (Pentavalent)	At 6 , 10, and 14 weeks	0.5 mls- Intramuscularly on the left outer thigh
Pneumococcal vaccine(PCV 10)	At 6 , 10 and 14 weeks	0.5 mls- Intramuscularly on the right outer thigh.
IPV	At 14 weeks	0.5 mls-Intramuscularly on the right outer thigh2.5 cm or 2 finger breadths from the site of PCV 10 injection
Rota virus vaccine	At 6 and 10 weeks	1.5 mls- Administered orally
Measles /Rubella	At 9 and 18 months or at six months in an event of Measles/ Rubella outbreak or HIV exposed children	0.5 mls- Subcutaneously left upper arm
Yellow fever	At 9 months at selected districts (Baringo, Keiyo, Koibatek and Marakwet) and also for travelers who are going out of the country.	0.5 mls- Subcutaneously right upper arm
Tetanus Toxoid (TT)	Pregnant women: TT1 at first contact or as early as possible in pregnancy, TT2 at least 4 weeks after TT1.	0.5 mls- Subcutaneously on the deltoid muscle
Vitamin A	At 6months and repeated every six months up to 59 months and within 6 weeks after delivery for postpartum mothers	6-11 months :100,000 IU orally 12- 59 months :200,000 IU orally

(MOH, 2016),(WHO, 2011), (MOH, 2011)

2.1.2 Prevalence of adherence to immunization schedule among children less than 24 months.

The government of Kenya is committed to eliminate immunizable diseases by provision of free vaccines to all children less than five years. However, documented Kenya vaccination coverage for children below one year (KNBS, 2014) and Nairobi County, 2018 is 76% and 61.5% respectively both being below the internationally accepted targets of 90 % coverage. According to available data in the Maternal and Child health clinic in KNH, 77 percent of children are fully immunized at any time. Out of these, only 65 percent adhere to immunization schedule.

2.2 Enabling Factors of the current strategies of improving adherence to immunization schedule

Technology- based interventions in health care have demonstrated great potential to transform vaccine delivery support and improve immunization coverage in the United States (Fiks, 2014). Mobile phone- based reminder has been considered a useful strategy in rural Western Kenya to have clients remember their due immunization dates (Hotenzia, 2013). Reduction of missed opportunities by health care providers can be enhanced by provider based interventions which include client reminders/ recall, assessment of the knowledge level of each mother and education of clients (Nia, 2011).

Health care providers can promote vaccination acceptance by most hesitant care givers though creating rapport and delivering the information in a way that it is as transparent as possible. Supportive open communication builds rapport and this gives a chance to the caregivers to verbalize their concerns openly (Anderson, 2015)

2.3 Barriers to current strategies of improving adherence to immunization schedule

Accessibility to health services has remained a challenge to many. In Kenya, 20 percent of children do not have access to immunization each year. One known barrier to utilization of healthcare is long distance to healthcare facilities (Moisi, 2009). One out of seven children die before reaching their 5th birthday from causes that are vaccine preventable (Chesoli, 2015).This points out the importance of exploring strategies which will lead to improvement of immunization services in Kenya, regionally and even worldwide.

Another barrier to current strategies of improving adherence to immunization schedule is nurse client ratio. Results from workload indicated that heavy workload negatively influences program delivery. Workload mainly affects the programs by influencing the quality of client counseling on the importance of vaccine and of quality of recorded vaccination data (Chesoli, 2015). Adequate information to clients helps them understand the relationship between non-adherence to immunization schedule and vaccine preventable diseases.

Social determinants have also been found to play a role in non-adherence to immunization schedule. They impact greatly on childhood immunization in developing countries leading to inadequate or non-immunization of children (Chesoli, 2015).Low adherence to immunization schedule has been associated with social demographic characteristics of the parents/ caregivers which range from family size to the level of caregiver education. Health system factor which include long distance to the health facility also play a role in in non-adherence to immunization schedule (Lobo, 2000).One study also cited factors for incomplete vaccination as maternal education, socioeconomic status of the family, lack of knowledge about immunization, ignorance and fear of losing daily employment (Pore, 2012)

Religion also plays a role as a barrier to current strategies of improving immunization schedule. Parents who chose not to have their children vaccinated(refusal) may base their refusal entirely on religious beliefs as recently demonstrated among the Kavonokia religion members of Eastern Kenya (Githinji, 2014). Some parents may be misinformed about adverse reactions following immunizations such as death or seizure (Anderson, 2015). This misinformation will cause fear of vaccinations hence becoming a barrier to current strategies of improving immunizations.

Missed immunization opportunities occur when a mother visits a health care facility and the child is not given some of the scheduled vaccinations for the day. In a study done in Nigeria, it was shown that factors associated with incomplete childhood vaccination were characteristics related to both health service and mother/ child. Antenatal care, postnatal care, misconceptions about contraindications to vaccinations and place of delivery of the baby were found to be major predictors for incomplete vaccinations (Melaku, 2015).

In a study done in Dili, Indonesia, factors such as inconsistent and irregular immunization schedules, lack of adequate outreach activities, health care providers' negative attitude toward clients, primary caregivers being busy with other obligations and lack of understanding of the benefits of vaccination are related to low immunization coverage (Ruhul, 2013).

2.4 Strategies focusing on the care giver to improve adherence to immunization schedule

Parental acceptance of vaccinations may range from accepting to hesitancy to rejection. The parents who have a high trust in healthcare providers tend to accept vaccinations and this result in their children being fully immunized (Anderson, 2015).

Effective communication is key in strengthening immunization acceptance. Providing information about immunization should involve assessing the appropriate environment and positive attitude of the one delivering the message as well as the receiver of the message. (Afiong, 2017). Knowledge of as well as understanding the clients can help in choosing communication strategies (Diego, 2014). Parental and community education on the benefits of childhood vaccinations can enable them in practicing preventive healthcare therefore improving the uptake of immunization services (Nia, 2011).

The reminder system can improve client's adherence to health services including immunizations (Oluwatosin, 2017). Reminders help to inform parents/caregivers of the due date for their children's vaccination (Nia, 2011). In one study, it was observed that two main causes of missed vaccinations were that the prior reminders were not sufficient to parents and parents' forgetfulness. Another study found out that reminders to vaccination are effective in increasing immunization rates (Albarrak, 2016).

2.5 Strategies focusing on the Health System to improve adherence to immunization schedule

As the countries are embarking upon journey towards Universal Health Coverage (UHC), the learning and initiatives for scaling up coverage in immunization programs and experiences from new vaccines introduction, combined with health system approach, should be optimally utilized

for expansion of other health interventions (Lahariya, 2015). Getting more immunized children can be achieved by regular immunization outreach services, home visits to identify unvaccinated children and integrating immunization services with other services (Angela, 2016)

As they transit out of donor funding, both the National and County governments' budgets must plan for and assure investments on vaccines. During budgeting, they must consider immunization programmes and engage stakeholders and community leaders in prioritizing the immunization agenda through their County Integrated Development Plans (Chatterjee, 2018).Previous studies have explored factors associated with implementation of childhood immunization programs. Most of these studies focused on the demand side factors which include parity, household income, ethnicity, place of delivery, mother's level of education, distance to health facility, culture, religion, age and forgetfulness of guardian due to preoccupation with other activities (Chesoli, 2015)

Information passed to clients on the importance of completing immunizations is in most times not communicated in a way that the clients can understand. This contributes to incomplete childhood immunizations. Experience shows that attempts to improve mothers/ caretakers knowledge of immunization improves immunization coverage in both levels of literacy (UNICEF, 2008).The role of the programmes is to do a follow up and ensure that children complete all doses of immunizations (UNICEF, 2008).

2.6: THEORETICAL FRAMEWORK

The Health Belief Model (HBM) is the theoretical framework, which will be used in this study. The model can be used to guide health promotion and disease prevention programs and among them is childhood immunization. The HBM is used to examine client's motivation to health promotion and disease prevention (Antoinette B, 2012). It is one of the most widely used models for understanding health behaviors. The HBM includes the following six key elements which focus on individual beliefs about health conditions and predict individual health related behaviors: Perceived susceptibility, perceived severity, perceived benefits, perceived barriers to action, cues to action, and self-efficacy.

In the study, these six elements will be applied as follows: Perceived susceptibility (perceived threat to sickness following missed immunizations), perceived severity (belief of consequences of not having the child immunized),perceived benefits (potential positive benefits such as being immune to diseases), perceived barriers to action(negative beliefs about immunizations), cues to action (exposure to factors that prompt to action e.g. a past experience of attack by an immunizable disease), and self-efficacy(confidence to have the child complete immunizations).

The perception of the individuals on the four variables can predict their action towards accepting vaccinations. HBM suggests that individuals will accept to take a health related behavior if they feel they are susceptible to a negative outcome such as a vaccine preventable disease (Carpenter, 2010). Children who miss vaccine doses are more likely to contract childhood diseases (Phillip J Smith, 2011). The basis of HBM is that parents will take their children for vaccinations if they believe that vaccine preventable diseases (negative health condition) can be avoided through vaccinations.

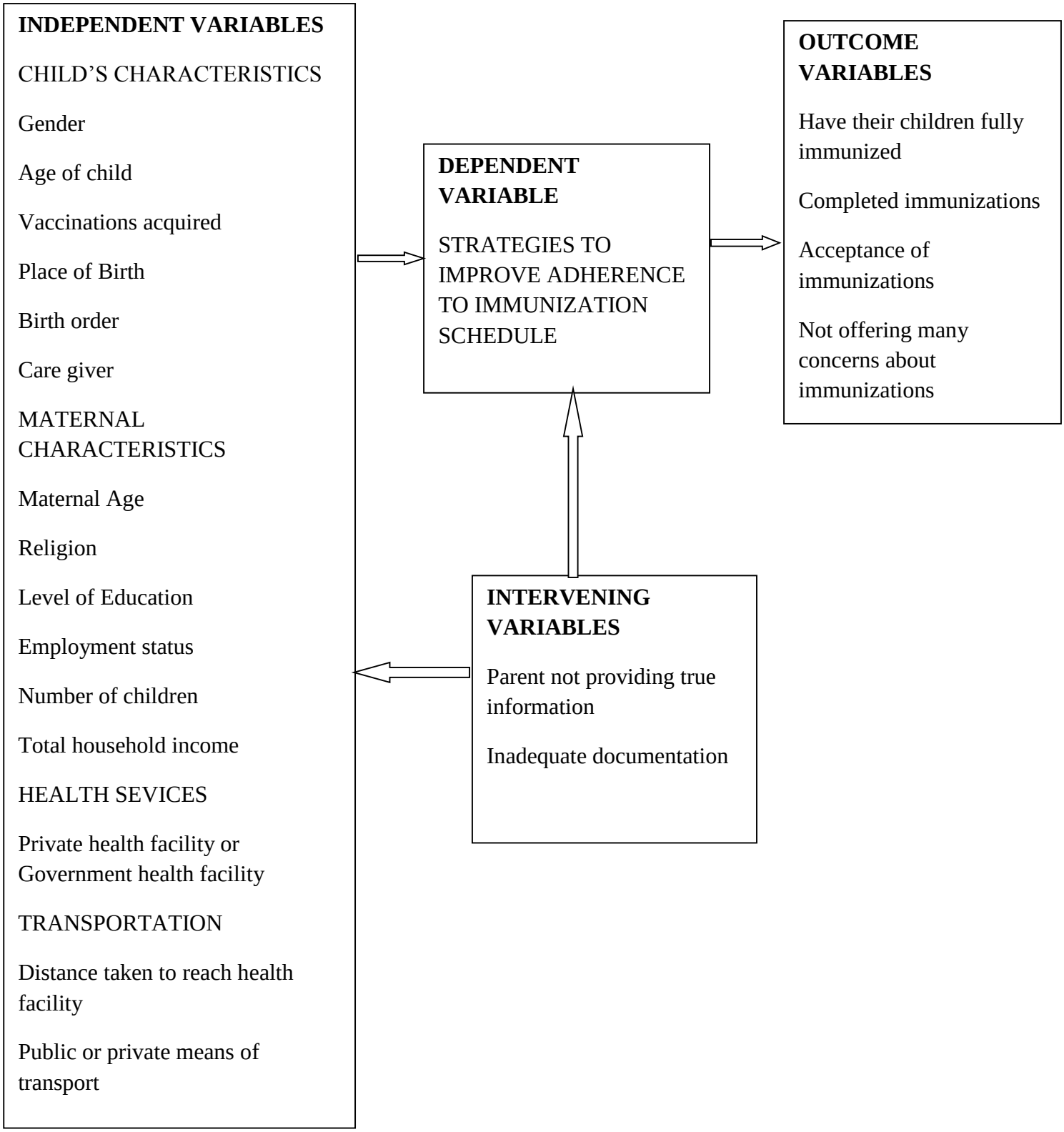
HBM predicts that people will be motivated to take act ion and avoid a negative health outcome if the perceive strongly that the negative outcome will be severe such as physical/mental impairment or death. For immunizations, a parent will accept to take his/her child for immunizations if he/she has a belief that the immunizable disease will cause death of the child. If the parents perceive the immunizations will not prevent diseases, they will unlikely take the children for the services.

Second, the model predicts that the stronger people's perception of the severity of the negative health outcome, the more they will be motivated to act to avoid that outcome. Specifically, if the undesirable health outcome will not have a large impact on the individual's life, she or he will not be motivated to act to avoid it. Severe outcomes include death, physical or mental impairment, pain, etc. In the case of immunizations, parents are more likely to get their children immunized if they believe the immunizable disease has a high likelihood of mortality if it develops. Susceptibility and severity concern the individual's perception of the negative health outcome.

The other two variables in the model concern the individual's perception of the target behavior that will supposedly reduce the likelihood of the negative health outcome.

The individual must perceive that the target behavior will provide strong positive benefits. Specifically, the target behavior must be likely to prevent the negative health outcome. If the parents perceive that immunizations are unlikely to prevent diseases, they will unlikely take the children for the services. Finally, the model argues that if people perceive there are strong barriers that prevent their adopting the preventative behavior, they will be unlikely to do so.

2.7: CONCEPTUAL FRAMEWORK



CHAPTER THREE: METHODOLOGY

3.1 Study Design and Rationale

Descriptive cross- sectional design was used. Quantitative method emphasized objective measurements and the statistical analysis of numerical data collected through questionnaires. Data can take the form of frequency of responses or participants' verbal or written responses that are quantified into numerical values (Kline, 2018).

The cross- sectional design is one of the most commonly used study designs in health promotion (Kline, 2018). There is a fixed time frame as data is collected from the sample population in one point.

Quantitative method consisted of face- to- face administration of questionnaires, which is a convenient method of collecting data that will seek to explore strategies to improve adherence to immunization schedule among children aged below 24 months attending MCH in KNH.

Two focus group discussions and two key informant interviews were conducted for the qualitative study.

3.2 Study area

Maternal and Child Health Clinic (MCH) in Kenyatta National Teaching and Referral Hospital (KNH) was the study area. The MCH is located at Clinic 66. It has a well-baby clinic where children less than 60 months are seen. Services offered are growth and development monitoring and childhood immunization as well as Family Planning services.

Kenyatta National Hospital is situated 4km from the city center off Ngong road along Hospital Road. It occupies 45.7 Hectares of land and within its complex is the College of Health Sciences

of the University of Nairobi (UON) and other training and government institutions under the Ministry of Health. The Kenyatta National Hospital receives patients from various parts of the country as well as from East and Central Africa. Administratively, the hospital is divided into various departments according to different specialties. Maternal and Child Health (MCH) Services is one among many services offered at KNH on outpatient basis.

Kenyatta National Hospital is within Lang'ata Sub- county Public Health services of the Ministry of Health. As allocated by the Lang'ata District Public Health Nurse, our coverage area for vaccination is the area within the following boundaries: Mbagathi way, Ngong Road, Kenyatta Avenue, Uhuru highway and along the railway line which boarders Madaraka estate and upper hill. However, KNH being a national referral hospital, we get self- referred clients from all over Nairobi and its neighboring counties like Kiambu, Machakos and Kajiado. We also immunize transit babies i.e. those who have been admitted to the paediatric wards and have not been immunized as well as babies in KNH maternity unit soon after they are born.

3.3 Study Population

The study population consisted of children aged below 24 months attending MCH and their parents/ caregivers. Nurses who have worked in the clinic for more than five years also were interviewed as key informants.

3.3.1Inclusion criteria

1. Caregivers of children aged between 6 weeks and 24 months and seeking services at MCH, KNH were included in the study.

2. Caregivers who agreed and consented to take part in the research.

3.3.2 Exclusion criteria

1. Caregivers of children above twenty- four months and those below 6 weeks of age were excluded from the study.

2. Caregivers who did not agree or not consented to take part in the research were excluded from the study.

3. Caregivers who were classified as vulnerable (mentally challenged, underage/adolescents).

3.3.3 Eligibility criteria for nurses

Nurses who had worked in the clinic for not less than five years and consented to participant in the study were included as key informants.

3.4 Study sample size determination

Records obtained from MCH health information records indicate that 1010 children less than 24 months were seen in the MCH, KNH in the months of September 2018 and October 2018, which is an average of 505 children seen every month. The study was conducted within a period of one month therefore the total population available was 505.The desired sample size was determined by the following Fishers formula as cited by Mugenda and Mugenda (1999).

$n=Z^2pq/d^2$

n= desired sample size (If the target population is greater than 10 000)

Z= The standard normal deviation at the required confidence interval = (1.96).

P= The proportion in the target population estimated to have the characteristics being measured. Since strategies to improve adherence to immunization schedule are not known, p is taken as 50%

q=1-p= (1-0.5) =0.5

d=the level of statistical significant set when accuracy desired is 0.05

Therefore:

$n = (1.96^2)\ (0.5)\ (0.5)/\ (0.5^2)$

n=384.16= 385

The target population in this study being less than 10, 000, the researcher adjusted the sample size for finite population by use of the following fisher's formula:

Nf = n/1+ (n/N)

N = actual number of children under 24 months seen in one month =505

Nf= 385/ (1+385/505)

Nf= 213.88 =214

The required sample size was 214 parents/caregivers.

3.5 Sampling method

Simple random sampling was used to obtain the study sample. Children who met the inclusion criteria were randomly sampled after the caregiver consented. Participant number one was selected by simple random among caregivers who accompanied their children to the clinic. The caregivers were allowed to pick a folded paper from a bucket (the papers were numbered). The caregiver who picked a paper numbered 01 was the first respondent. Thereafter, every alternate caregiver to a

child aged between 6 weeks and 24 months was included in the study. This method gave the potential participants an equal opportunity to be included in the study.

The total population and the sample size determined the sampling interval.

Sampling interval = Total population / sample size

= 505/214= 2.3 = approximately 2

Each second child according to the list of children (parents) who came to the clinic each day was systematically sampled until the required number of participants was reached (214 participants in one month)

3.6 Recruitment and training of research assistants

The researcher identified one research assistant among the registered BScN nurses in the month of April 2019 before pretesting of research instruments was done. The identified nurse agreed to take part and underwent three days training session. The training involved how to identify the study participants and emphasis on adhering to ethics of research was taught e.g. providing informed consent to every participant. A return demonstration on how to fill the questionnaires and how to verify the completeness of the research instrument after it has been filled was done.

3.7 Study instruments

3.7.1 Data collection tool: Quantitative data

Semi structured questionnaire (Appendix IV) was used to collect data. The tool was divided into two parts. The first part covered social demographics data, which was sub- divided into parent/ caregiver social demographics and child demographics. The second part covered child immunization status. Verification of immunization status was done using immunization booklet or

caregiver's verbal report and also where there was doubt Immunization permanent register was referred to.

3.7.2 Qualitative data collection tools

An interview guide (Appendix IVb) was used to guide Focused Group Discussions (FGD). The guide had open questions which enabled the participants express themselves exhaustively.

A key informant interview guide (Appendix IVc) was used to interview two nurses who had worked in the clinic for more than five years. The guide had two sections. Section A covered social demographic data and section B had questions about the clients seen in the clinic.

The parents' questionnaire was in English and Swahili versions and the interview was conducted in English or Kiswahili where applicable.

3.8Procedures for data collection

3.8.1 Pretesting of study instrument

The study instrument was pretested in the Maternal and Child Health clinic. Since the data collection procedure took only one month, there was no likelihood of including these participants in the study twice because the appointments are scheduled after every four weeks. The aim of this was to verify the data collection tool before data was collected and also help to estimate the time that would have taken to administer the questionnaire to each respondent. The pre- test results were used to improve the study tool for validity and reliability. The pre- testing used 22 respondents which were10% of the study sample size.

3.8.2 Recruitment and enrolment of study participants

Caregivers of children attending the Maternal and child Health clinic in KNH and who met the inclusion criteria were sampled. The researcher approached each sampled parent, introduced herself to her and informed her of the intended study. Study participants were given information that pertains to their participation (Appendix 3a) in the study in order to make an informed consent (Appendix 3c).

The FGD participants who met the inclusion criteria were recruited among the caregivers who attended the clinic. They were then given information on the study title, objectives and benefits. Upon acceptance to participate, they were requested to sign a consent form (Appendix 3e). Consent was obtained from each parent who agreed to participate in the study. Those who consented to participate in the study recruited and enrolled for the study. The parents who were not subjected to a semi structured interview participated in a focused group discussion.

3.8.3 Interview procedure (Data collection)

Data was collected over a period of one month. Quantitative data was collected in the first phase. The researcher collected the data through interviewer administered questionnaire to Parent /Care giver of the children aged below 24 months attending Maternal and Child Health clinic. This took one month.

Qualitative data was collected in the second month. This second phase involved two sessions of FGDs (each with ten mothers) and through Key Person Interview (KPI) of two nurses who have worked in the clinic for more than five years.

1. The FGDs were acquired from the MCH clinic. Two sessions were held and each group comprised of 10 parents/ caregivers who had not been subjected to semi- structured questionnaires.

Samples for FGDs were obtained through simple random sampling method. A folded paper labeled Yes/No was given to each potential participant and those who picked 'Yes' were included in the FGD. The participants were engaged in a group discussion led by the researcher using an FGD guide and the research assistant was taking field notes and noted the responses in the spaces provided in the FGD guide.

2. Key Person Interviews were conducted by the researcher using a KPI guide.

Each FGD and KPI were audiotaped and each took an average of thirty minutes.

3.9 Data Management and Analysis

3.9.1 Quantitative data

Questionnaires were verified for completeness at the end of each day of data collection. A unique code for each questionnaire was entered into a Microsoft Excel spreadsheet where data cleaning was done. Identification of missing/ extreme values and inconsistencies were done and corrected. Incomplete and wrongly answered questionnaires were omitted during data entry process. Inferential and descriptive statistics were used to analyze data. Descriptive analysis was done using mean, frequencies and proportions. Associations between variables were done using Pearson's Chi- square.

3.9.2 Qualitative data

Qualitative data from FGD and KPI were transcribed and translated. Analysis was done manually by reviewing the field notes and listening to the audiotapes from focus group discussions and grouping the research findings as per the study objectives. Different positions emerging under study objectives were noted and a summary written.

Data storage was in password protected computer hard drive, hard disks and personal email account.

3.10 Data presentation and Dissemination plan

Analyzed data was presented in tables, pie charts and graphs. The study results were disseminated to University of Nairobi and Kenyatta National Hospital. Further dissemination was done through report prints, seminar presentation, workshops and journal publications.

3.11 Ethical considerations

The research proposal was reviewed for approval by the KNH/UON Ethics and Research committee (ERC). Participants were informed about the study purpose, following which a request for them to participate in the study was done. It was emphasized that their participation was entirely voluntary; that they could opt out at any time and that there would be no consequences resulting from non-participation. All participants were required to fill a consent form and no names or particulars were included in the questionnaire. Dignity and privacy of the participants was assured. Participants were informed that no risks would be involved as they were only be required to answer questions. They were informed that data would be held in total confidence and that information gathered would only be shared to relevant parties for implementation.

Those children identified to have missed vaccinations were given the missed vaccines and the caregiver informed that the subsequent vaccinations would continue on monthly basis as per schedule until the child completes the missed vaccines.

Data was fully made anonymous so that neither individuals nor participants could be identified. Data was kept locked in a filing cabinet and a password protected computers.

3.12 Study assumptions

1. In this study, it was assumed that all the study participants' information was accurate.

2. All participant information would be anonymous, so it was also assumed that questions would be answered honestly and to the best of the participant's ability.

3. It was assumed that the inclusion criteria of the sample were appropriate and therefore, assure that the participants would provide answers to the research questions.

4. It was assumed that the participants had a sincere interest in participating in the research and would not expect any other motives, such as getting favors during care because they agreed to be in the study.

5. It was assumed that the sample represented the target population.

3.13 Study limitations

Kenyatta National Hospital client population comes from Nairobi and its environs. The study sample therefore might not have been proportionate representation of the country's population thus generalization may be limited to cosmopolitan setting.

CHAPTER FOUR: STUDY RESULTS

4.1: Introduction

A total of 214 caregivers with children attending the Maternal and Child Health Clinic at Kenyatta National Hospital were enrolled into the study. The main objective of the study was to explore strategies that will improve adherence to immunization schedule among children under 24 months attending Maternal and child health clinic at Kenyatta National Teaching and Referral Hospital.

This chapter presents the obtained results with highlights on the percentage among the measured variables as per the study objectives. The presentations are under sub topics which focus mainly on strategies that will improve adherence to immunization schedule. Presentation and interpretation are based on the quantitative and qualitative data collected on the 214 participants (caregivers), two focus group discussions and two key informants. The results in descriptive and inferential statistics are in form of tables, graphs and pie charts.

4.2 Caregiver/ child social- demographic characteristics

4.2.1 Caregiver social demographic characteristics

At the end of the study, the recruited caregivers of children attending the Maternal and Child Health clinic were 214. The distribution of the social-demographic characteristics of the care givers are demonstrated in Table 1.

Ninety two percent (92.2%) of those who escorted their children to the clinic were mothers, 6.1% were the fathers while the smallest percentage 1.9% were brought by other relatives. The mean age was 30 years. The age category of care givers showed a wide distribution with 0.5% aged below 20 years, 14.6% between 20 and 25 years, 47.9% being in the age category of 26 to30 years and 37.1% aged between31 and 49 years. With regard to marital status, majority 86.8% of the care

givers were in a married relationship and the rest were either single 10.4%, widowed 2.4% or separated/ divorced 0.5%. The highest percentage of the care givers 55.1 % lived in Nairobi County while the rest 44.9% lived in the neighboring counties. With respect to education level, all the care givers had some level of education. Those having university/ college level of education had the highest percentage 56.1 %, while 37.7 % had attained secondary school level of education and6.1% primary level. In occupation, those with salaried employment 47.1% were the highest. The rest were either self-employed 43.6%, Casual laborers 7.1%, housewife/not employed 10 % or student 0.5%. (Table 4.1)

Table 4. 1 Caregiver's Social Demographic characteristics

Social-demographic characteristics		Frequency (n=214	Percentage (%)
Mean age(+SD) 30(+/-1)			
Age in years	Below 20	1	0.5
	20-25	31	14.6
	26-30	102	47.9
	31-49	79	37.1
Relationship with the child	Mother	195	92.0
	Father	13	6.1
	Guardian	4	1.9
Marital status	Single	22	10.4
	Married	184	86.8
	Widowed	5	2.4
	Separated/Divorced	1	0.5
Residence (County)	Nairobi	118	55.1
	Neighboring	96	44.9
Highest level of education	Primary level	13	6.1
	Secondary level	80	37.7
	College/ University level	119	56.1
Occupation	Student	1	0.5
	Housewife/ Not working	2	0.9
	Casual laborer	15	7.1
	Self-employed	92	43.6
	Salaried employment	101	47.9

4.3: Relationship between care giver social demographics and adherence to immunization status

On bivariate analysis as shown in table 4.2 below, there was a significant relationship between the level of education of the care givers and adherence to immunization schedule. Those who had college/ university level of education (60.5%) were more likely to adhere to immunization schedule than caregivers with primary level (15.4%) and secondary level of education (41.3%).

Marital status was statistically significantly associated with adherence to immunization schedule. Care givers who are single had increased non- adherence to immunization schedule (63.6%) as compared to those who are married (44.6%).

The study found no significant association between non- adherence to immunization schedule and the other social demographic characteristics of the caregivers (Relationship with the child, age, occupation, gross income per month, time taken to reach the nearest immunization clinic and amount of money used as bus fare).

Table 4. 2 Social demographic characteristics of caregivers and adherence to immunization schedule

		Did the child get immunizations as scheduled? Refer to immunization card/ booklet		
		YES	NO	
		%	%	p-value
Relationship with the child	Mother	55.7	44.3	0.784
	Father	46.2	53.8	
	Guardian	50.0	50.0	
	Other	.0	.0	
Age	Below 20 years	100.0	.0	0.276
	20-25 years	67.7	32.3	
	26-30 years	55.4	44.6	
	31- 49 years	49.4	50.6	
	Above 49 years	.0	.0	

Marital status	Single	36.4	63.6	**0.046**
	Married	55.4	44.6	
	Widowed	.0	100.0	
	Separated/Divorced	.0	100.0	
Highest level of education	Primary level	15.4	84.6	**0.002**
	Secondary level	41.3	58.8	
	College/ University level	60.5	39.5	
	Have no formal education	.0	.0	
Occupation	Student	.0	100.0	0.074
	Housewife/ Not working	100.0	.0	
	Casual laborer	26.7	73.3	
	Self-employed	54.3	45.7	
	Salaried employment	59.4	40.6	
Gross income per month	<10,000	45.8	54.2	0.672
	11,000-20,000	58.7	41.3	
	21,000-30,000	56.8	43.2	
	31,000-40,000	61.9	38.1	
	> 40,000	53.8	46.2	
Time taken to reach the nearest immunization clinic and back home	< 1 hour	55.7	44.3	0.539
	2-3 hours	54.6	45.4	
	4-5 hours	.0	.0	
	> 5 hours	.0	100.0	
Money used as bus fare to reach the clinic and back home	< 100/-	51.7	48.3	0.522
	100-200/-	52.8	47.2	
	above 200/-	57.8	42.2	
	Private means	70.6	29.4	

4.4: Determinants of adherence to immunization schedule

In multivariate analysis as shown in table 4.3, the study showed that adherence to immunization was determined by the level of education of the care giver (OR=0.886, 95% CI= 0.566- 1.386; P= 0.002) and Marital status of the care giver (OR=2.299, 95%CI=1.022-5.172; P=0.046).

Table 4.3 Determinants of adherence to immunization schedule

	Coefficient	S.E. of coefficient	p-value	OR	95% C.I.for OR	
					Lower	Upper
Residence (County)						
Nairobi Neighboring	.116	0.55	0.829	1.11	0.43	2.91
Marital status						
Single Married Separated/ Divorced	.832	.414	**.046**	2.299	1.022	5.172
Highest level of education						
Primary Secondary College	.121	.229	**0.002**	1.886	.566	1.386

4.5: Child Demographics

4.5.1: Social demographics of the children

The age distribution of the children was as follows:

26.9% of the children were aged 6 weeks up to 3 months, 25.9% aged 3 months up to 6 months, 23.1% aged 6 months up to 12 months and those aged 12 months to 24 months were 24.1%. Gender distribution was almost equal with males being 50.2% and females being 49.8%. All the care givers reported that their children were delivered in hospital (100%). (Table 4.4).

Table 4. 4 Child demographics

Age		n	%
Age of child	6 weeks - < 3 months	57	26.9
	3 months - < 6 months	55	25.9
	6 months-< 12 months	49	23.1
	12 months- 24 months	51	24.1

Gender of your child	Male Female	104 103	50.2 49.8
Place of delivery	Hospital	195	100.0
	At home	0	.0
	Don't know	0	.0

4.6 Gross family income

Income level for each represented family is shown in figure 4.1.As regards household gross monthly income, those who earned highest had the greatest percentage closely followed by those who earned least with 24.6% of the caregivers earning a gross monthly income of above Ksh.40, 000. 21.8 % earned between Ksh.11, 000 and Ksh. 20,000, 20.9% earned between Ksh.21, 000 and Ksh.30, 000. Those who earned between Ksh 31 000 and 40 000 were 10% (n=24) while those who earned less than Ksh.10, 000 were 22.7%. (Fig 4.1)

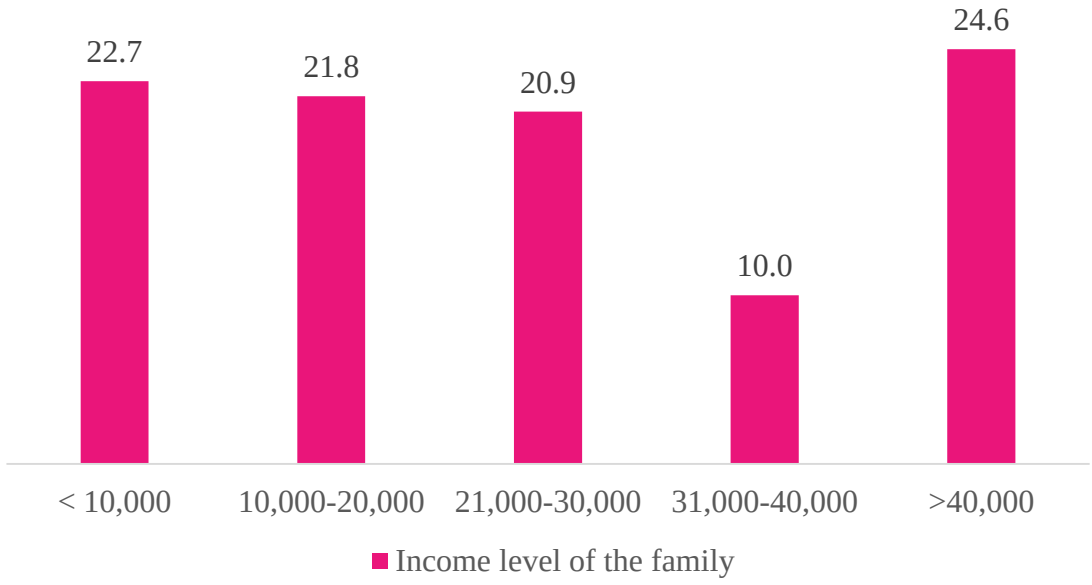


Figure 4. 1 Income level of the family

4.7 Time taken to reach health facility

Time taken by most of the caregivers to reach the nearest immunization clinic is 2-3 hours 66.5% while the rest took less than 1 hour 33.0% and over 5 hours 0.5%. (Fig 4.2).

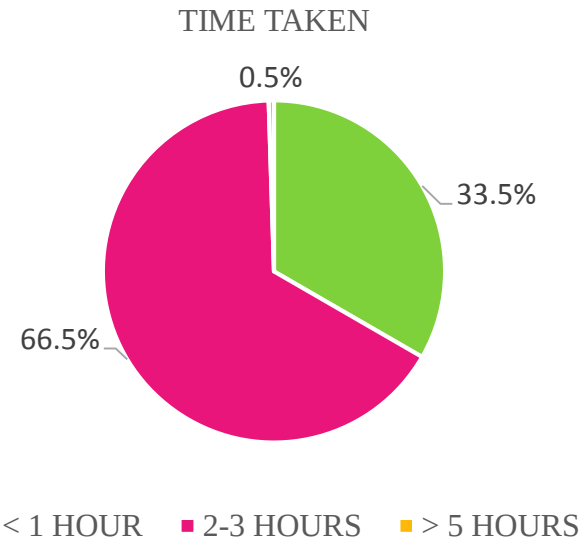


Figure 4. 2 Time taken to reach health facility

4.8: Amount of bus fare used

Most of the participants 42.2% used Ksh. 100-200 as bus fare to come to the clinic and back home while the rest 28.4% spent <Ksh.100, 21.3% spent above Ksh. 200 and 8.1% used private means (Fig 4.3).

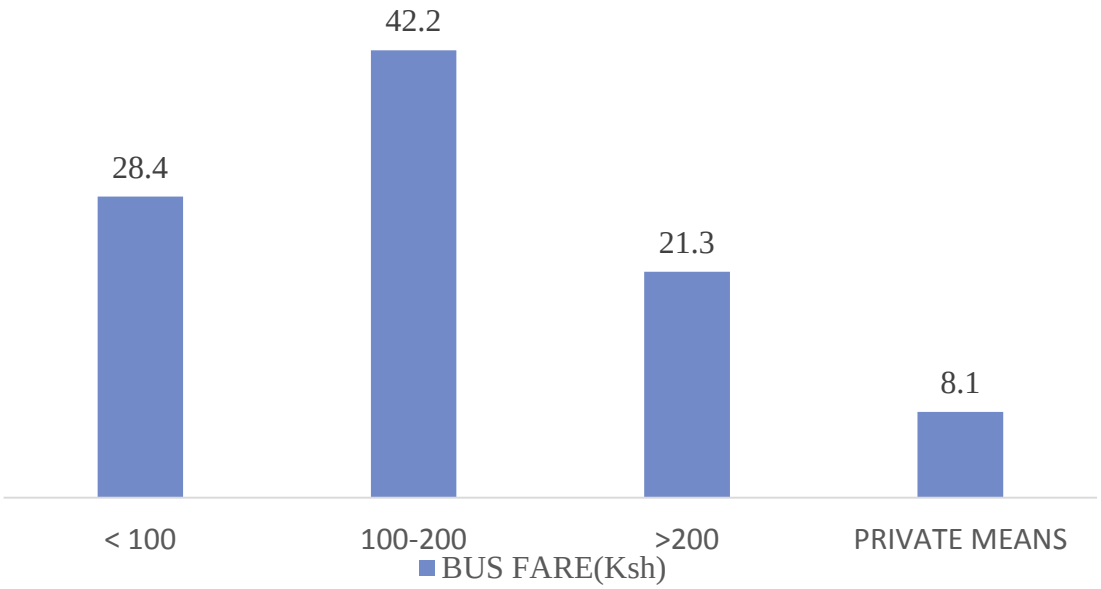


Figure 4. 3 Amount of bus fare used to and from the clinic

4.9: Child immunization status

Source of information regarding the child immunization status was the immunization booklet/card.

The majority of the children 73.8 % got BCG at birth while the rest 27.6% got the vaccine at first contact. For birth polio 76% out of the 214 participants got the vaccine. For the subsequent polio vaccines 94.7% got at 6 weeks, 79.3% were vaccinated at 10 weeks and 51% got the vaccine at 14 weeks. For DPT-Hep B-Hib (Pentavalent), 99.5% got at six weeks, 83.7% at 10 weeks and 53.2 % at 14 weeks. As regards PCV, all the children 100% who were supposed to have gotten the vaccine at 6 weeks at the time of the study had been vaccinated. 83.7 had been vaccinated at 10 weeks and 53. 2% had had the 3rd dose at 14 weeks. For Rota virus vaccine all the children100% who were expected to have been vaccinated at 6 weeks had been while those who got the second dose of the vaccine were 84.2 %. All the children 100% who were expected to have received Injectable Polio vaccine had been vaccinated. As for the measles vaccine at 9 months, 100% of the children had been vaccinated while 30.4% got the booster dose at 18 months. (Table 4.5)

Table 4. 5 Child Immunization Status

Vaccine	Birth	1st contact	6 weeks	10 weeks	14 weeks	9 months	18 months
BCG	**155 (73.8)**	**58 (27.6)**					
OPV	**158 (76)**		**197 (94.7)**	**165 (79.3)**	**106 (51)**		
Pentavalent			**202 (99.5)**	**170 (83.7)**	**108 (53.2)**		
PCV			**203 (100)**	**170 (83.7)**	**108 (53.2)**		
Rotavirus			**203 (100)**	**171 (84.2)**			
IPV					**107 (100)**		
Measles						**56 (100)**	**17 (30.4)**

4.10: Enabling factors of the existing strategies of improving adherence to immunization schedule

The care givers gave recommendations that would act as enabling factors to the already available strategies of improving immunization schedule and the greatest number 48.1% recommended that there should be more health facilities near residential areas. 27.4% said that vaccines should be available always. 23.6% said they should be reminded on return date using text messages. The other recommendations 5.8% were: Flexible clinic hours, making a follow-up when they fail to

come to the clinic, (Figure 4.4).

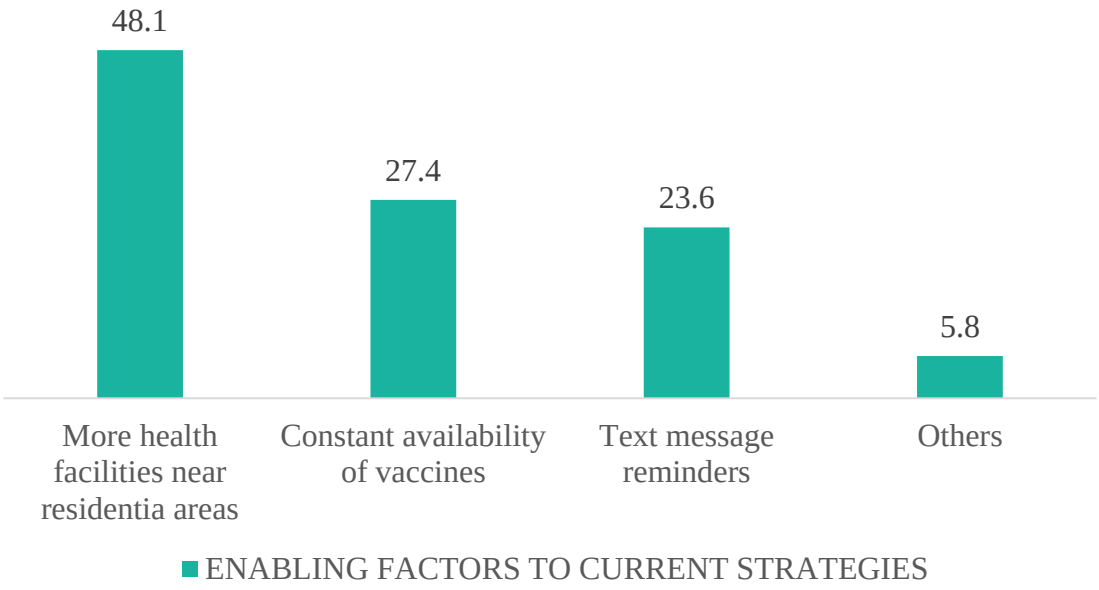


Figure 4. 4 Enabling factors to the existing strategies of improving adherence to immunization schedule

In the focused Group discussion, the care givers gave the following enabling factors: The respondents suggested some mechanisms for facilitating timely immunization. These include having services brought closer to their places of residence, reminders from nurses such as text messages or phone calls, putting alarms/reminders on their phones and referring to the immunization booklet more frequently. Some excerpts from the respondents include; "government should consider building a government hospital near our place", "text messages", "phone calls", "phone reminder", "immunization booklet" (Table 4.6 and figure 4.5)

Table 4. 6: Distribution of codes

Theme	Code	Count	% Codes	No. Words	% Words
Definition	Correct Definition	4	9.10%	25	2.70%
	Incorrect Definition	0	0	0	0
Utilization	Advantages	10	22.70%	59	6.50%
	Barriers	20	45.50%	107	11.70%
	Distance a facility	0	0	0	0
	Distance a barrier	3	6.80%	12	1.30%
	Facilitating factors	7	15.90%	23	2.50%

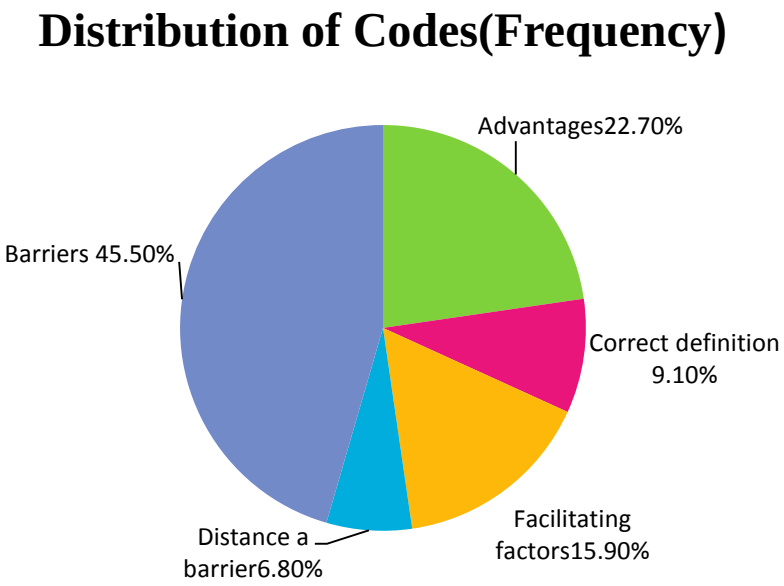


Figure 4. 5: Distribution of codes

4.11: Barriers of current strategies of improving adherence to immunization schedule

Thirty seven of the participants pointed out their employment being a barrier to adherence to immunization schedule, 29.2% said their home was far from the health facility, 25.5% gave baby's sickness as a barrier while 3.8% gave vaccine stock-out as a barrier. The other barriers 8.5% to immunization schedule which came up in the study were: care giver getting late to the clinic, too

demanding jobs, forgetfulness, lack of bus fare and traffic jam(Fig 4.6). These findings are also supported by the Focus group discussions (FGD) as stated below:

"*My work is very demanding. I work as a gardener/house-help and my employer sometimes tell me to postpone the clinic date when there is a lot of work to be done". (*FGD 1, Participant 4).

"*Sometimes I lack bus fare. Where I live there is no government hospital nearby and the nearest is either Kiambu or Kenyatta. If the clinic date falls on the time of the month when I have no money, I have to wait till I get so that I bring the baby to the clinic. Sometimes it can take even two weeks".* (FGD 1, Participant 6)

"*I get preoccupied and I forget only to remember when the due date has passed. The work I do occupies me the whole day and sometimes I work even on weekends". (*FGD 1, Participant 3)

"*Baby's illness. When the baby is on treatment, the baby has to complete treatment first before continuing with vaccinations".* (FGD 2, Participant 8)

"Traffic jam or even a vehicle gets involved in an accident and this cause delays which and upon reaching the clinic the vaccines are over". (FGD 2, Participant 7)

"employer sometimes tell me to postpone the clinic date", (FGD 1, Participant 8)

Other quotes were: "lack bus fare", "no government hospital nearby", "no money","I forget", "find when vaccines are over",

One key informant who mentioned that the key barrier was long distance to facility where vaccination was available and therefore clients arrive when clinic is already closed also supported this.

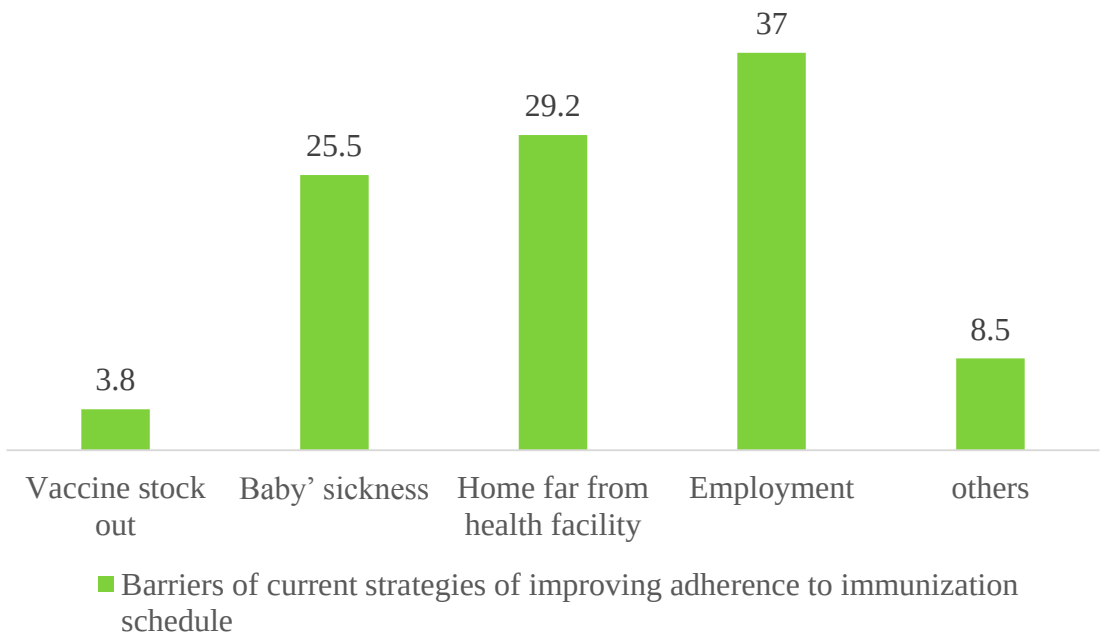


Figure 4. 6 Barriers of current strategies of improving adherence to immunization schedule

4.12: Feasible strategies focusing on the care giver that will improve adherence to immunization schedule

Each caregiver had a way of remembering the scheduled date. Most of them 60.5% stated that they refer to the immunization card and 20.5% use the phone to remind them. 11.9% use the diary as a reminder while 7.6% were other strategies used such as marking the date on the calendar, asking a family member to remind them and choosing a specific date on each month. The other strategies which came up in the study were: Informing the employer two days before that the clinic date is

almost due and asking a relative or neighbor to take care of other children as the care taker escorts the baby to the clinic. (Figure 4.7).

This was also supported by the following quotes from the Focus group discussion (FGD):

> "By *having a small baby, it is important for each mother to keep updating her reminder on the phone".* (FGD 2, Participant 1)

> *"I can use my phone reminder so the alarm goes on three days before the clinic date".* (FGD 1, Participant 10)

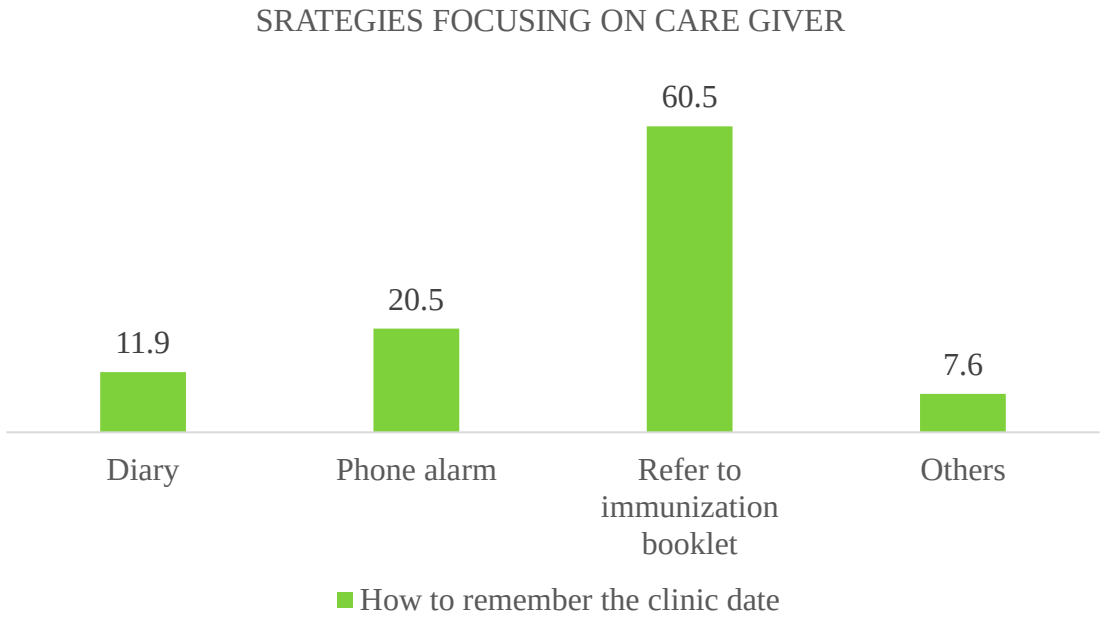


Figure 4. 7 Strategies focusing on care giver that will improve adherence to immunization schedule

4.13: Achievable strategies focusing on the Health system that will improve adherence to immunization schedule

Fifty seven per cent of the participants suggested that phone call reminders would help them remember the clinic date, 62. 6% gave a suggestion that the clinic should run for more hours per

day, 8.5% said that vaccines should always be available in the clinic while 0.5% gave a suggestion that health care providers should pay them a visit in their homes. (Figure 4.8)

Figure 4. 8 strategies focusing on the Health system that will improve adherence to immunization schedule.

4.14: Immunization status of the child

The figure below (4.9) compares child's immunization status as reported by caregiver and the verified status in the card. Most 54.9% of the caregivers indicated that their children had been immunized as per the schedule.45.1 % said their children did not get the immunizations as scheduled. Verification from the immunization card showed 45% had been fully immunized for age.

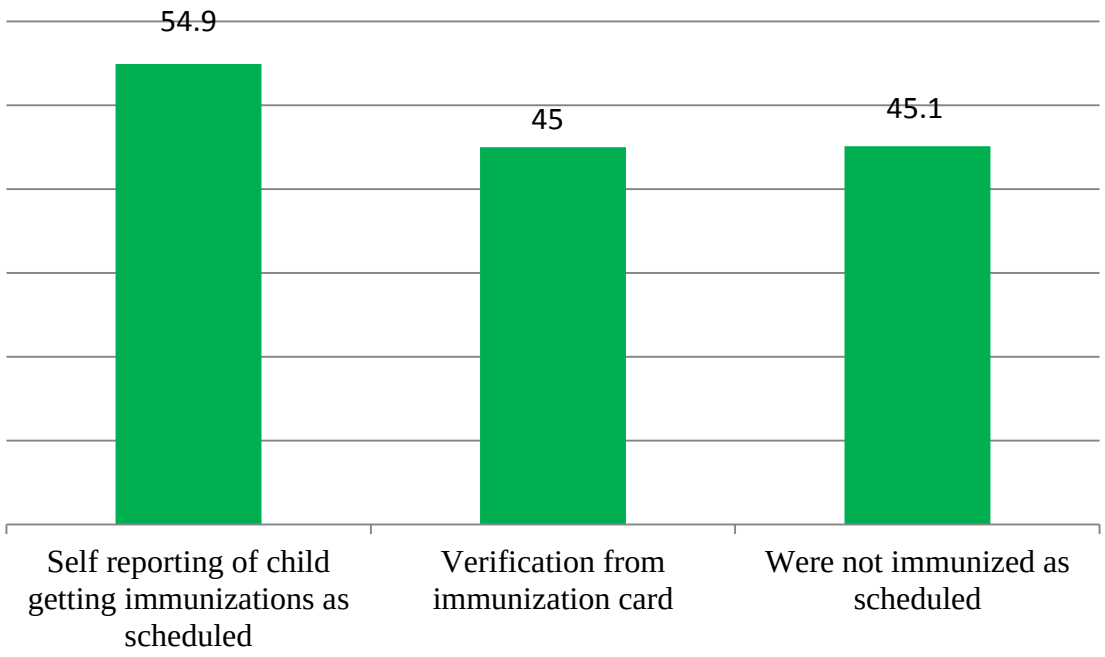


Figure 4. 9: Immunization status of children

4.15 Factors affecting immunization status of children

As for the factors that affected immunization status of the children, 88.2% confirmed that they received adequate information concerning immunizations and 11.8% stated that they did not. 46.9% reported that they have ever been turned away without their children getting immunizations and 53.1% confirmed that they have never been turned away. 66.8% said their children have ever missed immunization on the scheduled date while 32.2% said they have never missed. (Figure 4.10)

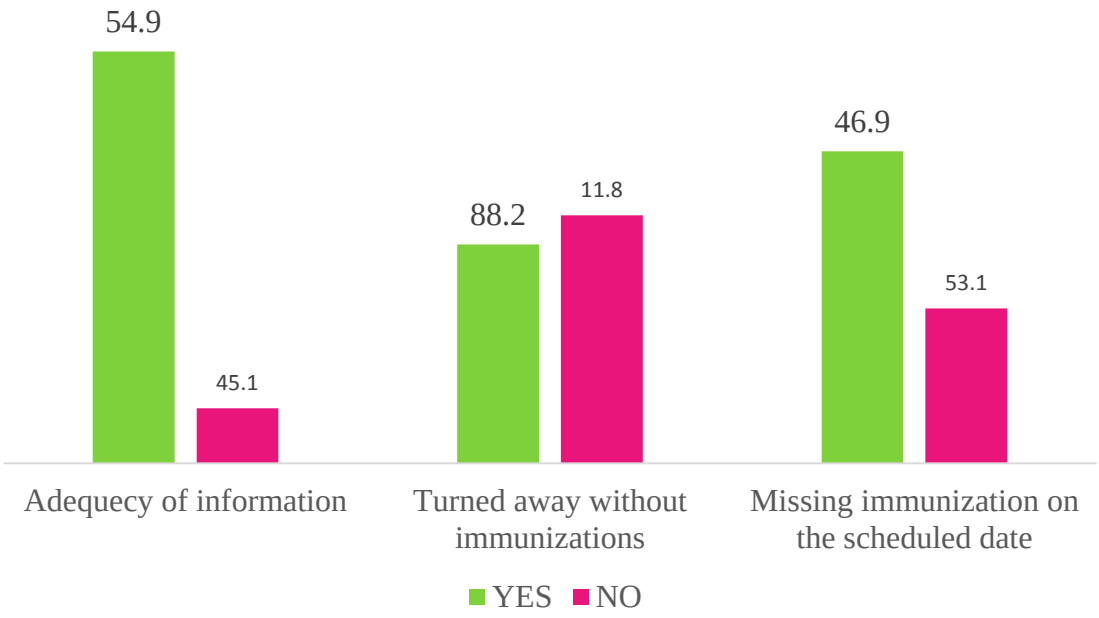


Figure 4. 10 Factors affecting immunization status of the child

4.16: Reason for missed schedule

The reasons given for the missed schedules were: The baby was sick 41.1%, the caretaker was at work 13.5%, 3.5% stated that they had travelled and 44.0% said they lacked bus fare (Fig 14.11).

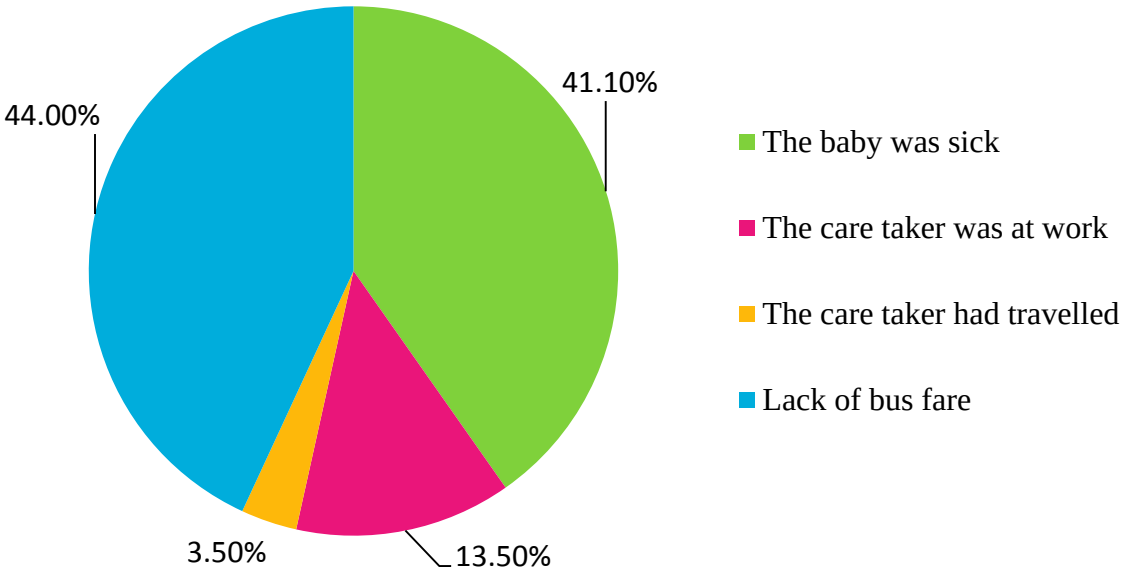


Figure 4. 11 Reason for missed schedule

CHAPTER FIVE

5.1: DISCUSSION

5.1.1 Introduction

This chapter entails discussion of the study results. The aim of the study was to explore strategies that would improve adherence to immunization schedule among children aged below 24 months.

The Kenya Expanded Programme on Immunization (KEPI) was established in 1980 by the Ministry of Health (MOH) with an aim of immunizing all children against childhood immunizable diseases in the country before their first birthday. Adherence to immunization schedule was found in the study to be 54.9% as per the child immunization booklet which indicated that the children got immunizations as scheduled. The 45.1% who did not get immunizations as scheduled is a high percentage and these results support the importance of putting in place those strategies which will help improve adherence to immunization schedule. The discussion is divided into sub sections. The analyzed diverse maternal and child characteristics as well as the results as per the research objectives have been elaborated. Discussion will involve univariate, bivariate and multivariate results.

5.1.2 Characteristics of the study population

5.1.2.1 Child characteristics

The distribution of all the age categories was almost the same in this study with the majority being between 6 weeks to below 3 months. This is because babies come for first and second immunizations in this category. All the children were born in hospital and this is attributed to the urban setting where the families live. As regards child immunization status, 27.6% of the children did not get BCG immunization at birth and this raises concern of the safety of the children who are released to the community without BCG vaccination in this era of increased

Tuberculosis infections. When we compare six weeks' immunizations e.g. Pentavalent 1 and fourteen week's Pentavalent, we note that there is a drop-out in immunization with subsequent vaccinations. This is related to report by Kenya Demographic and Health Survey 2014(KNBS, 2015) that the immunization coverage in Kenya was 79%.

This shows the importance of putting into place the strategies that will improve adherence to immunization schedule and prevent these drop-outs which expose the children to childhood immunizable diseases.

5.1.2.2 Socio- demographic characteristics of the care givers

The young adult age category (20-30 years) dominated in the study and this could be the reason of non- adherence to immunization schedule. This age category comprised of the caregivers who majority of them had some form of employment and they stated that they missed immunization schedule because they were at work. Strategies to improve adherence to immunization schedule such as flexible clinic hours or increasing clinic hours are vital in addressing this gap. As regards place of residence, a big number of the caregivers live outside Nairobi County and this is the reason why most of them stated that they missed immunization scheduled date because they arrived to the clinic late. In this regard, building more government health facilities near residential areas is important as this will reduce the time taken to reach the immunization clinic. With respect to level of education, majority of the caregivers were learned beyond primary school. Since the majority of the caregivers were mothers, this shows the acknowledgement of the girl- child education by the majority of Kenyans.

The study showed that 22.7% of the respondents had a gross monthly income of less than Ksh.10, 000. This implies that they had inadequate economic empowerment and can lead to

dependence on others economically and this contributes to missing immunization schedules due to lack of bus fare as stated by majority of caregivers. This incident can easily be prevented if more health facilities were available near residential areas.

5.1.3: Enabling Factors of the current strategies of improving adherence to immunization schedule

Twenty four per cent (n=50) of the care givers recommended that text messages should be used to remind them of the return date for immunizations. Previous studies supported this strategy. Mobile phone- based reminder has been considered a useful strategy in rural Western Kenya to have clients remember their due immunization dates (Hotenzia, 2013). A study done in USA, it came out that technology- based interventions in health care has demonstrated great potential to transform vaccine delivery support and improve immunization coverage in the United States (Fiks, 2014).

Reduction of missed opportunities by health care providers can be enhanced by provider based interventions which include client reminders/ recall, assessment of the knowledge level of each mother and education of clients (Nia, 2011).

5.1.4: Barriers to current strategies of improving adherence to immunization schedule

Thirty seven (n=78) of the respondents cited employment as a barrier to adherence to immunization schedule. One study also cited factors for incomplete vaccination as fear of losing daily employment (Pore, 2009). Another study by Ruhul (2013) pointed out a barrier to adherence to immunization schedule as primary care providers being busy with other obligations and only arrive to the clinic when it is late. One key informant who mentioned during the interview that the key barrier to immunization schedule was long distance to health facility and therefore clients arrive when clinic is already closed supported this.

Twenty nine per cent (n=62) of the caregivers said their home was far from health facility. This is supported by Moisi (2009) who stated that one known barrier to utilization of healthcare is long distance to healthcare facilities and Lobo (2000) who stated that health system factor which include long distance to the health facility also play a role in in non-adherence to immunization schedule.

One key informant who mentioned that the key barrier was long distance to facility where vaccination was available and therefore clients arrive when clinic is already closed also supported this.

With these results, these barriers can be eradicated by having more health facilities near residential areas and also flexible immunization hours.

5.1.5: Feasible strategies focusing on the care giver that will improve adherence to immunization schedule

With regard to strategies focusing on the care giver, the study revealed that most (60.5%) of the respondents stated that they refer to the immunization card as a way of remembering the clinic date. This is not a reliable strategy because they can easily forget. Care givers should be encouraged to get a more reliable strategy like phone alarm reminder which is used by a few (20.5%).

This was supported by a study done in Nigeria by Oluwatoseni (2017) who said that the reminder system can improve client's adherence to health services including immunization. In a study done in Kenya, forgetfulness of the care giver due to preoccupation with other activities was found to contribute to non- adherence to immunization schedule (Chesoli, 2008). Reminders help to inform parents/caregivers of the due date for their children's vaccination (Nia, 2011). In this

study, some care givers gave forgetfulness as a reason for missed schedules.In a previous study, it was observed that two main causes of missed vaccinations were that the prior reminders were not sufficient to parents and parents' forgetfulness. Another study found out that reminders to vaccination are effective in increasing immunization rates (Albarrak, 2016).

5.1.6: Achievable strategies focusing on the Health system that will improve adherence to immunization schedule

A total of 132 (62.6%) caregivers gave a suggestion that immunization clinics should run for more hours per day. This would be a good strategy of improving adherence to immunization schedule especially if there were flexible immunization hours. This is supported by the statement by Rahariya (2015) in a study done in India. The study stated that as the countries are embarking upon journey towards Universal Health Coverage (UHC), the learning and initiatives for scaling up coverage in immunization programs combined with health system approach, should be optimally utilized for expansion of other health interventions.

Care givers mentioned long distance to health facility as hindrance to adherence to immunization schedule. A previous study done in Kenya focused on demand side factors which included distance to health facility as hindrance to completion of immunizations (Chesoli, 2008).

11.8% of care givers pointed out in the study that they did not receive adequate information concerning adherence to immunization schedule. This is supported by a study done in Bangladesh. In this study, dropout rates were heightened by inadequate information about immunization schedule (Latifur Rahman, 2012). In an effort to improve adherence to immunization schedule, one of the strategies focusing on health systems is providing adequate information to caregivers either as groups or one on one.

5.1.7: Association between the care giver's socio-demographics and non- adherence to immunization schedule

Care giver's level of education significantly influenced adherence to immunization schedule. There was an increased non- adherence to immunization schedule among caregivers with primary level of education and secondary level as compared to those who had college/ university level of education. The study findings supports previous findings in a study done in India which found that low adherence to immunization schedule has been associated with social demographic characteristics of the parents/ caregivers which range from family size to the level of caregiver education (Lobo, 2000). One study also cited factors for incomplete vaccination as maternal education, socioeconomic status of the family (Pore, 2012). This implied that low level of education could have led to the care givers' lack of awareness of the negative outcomes of non-adherence to immunization schedule. It could also be due to the fact that caregivers who are educated have more knowledge about good medical practices. They could have, during their training come across courses on healthcare.

Marital status of the care giver also significantly influenced adherence to immunization schedule. Our study showed that single parents had a greater non-adherence status as compared to those who were married. In a study done in Ghana, it was found out that the people that are more likely to influence attendance to immunization clinic include healthcare worker and a supportive spouse (Ansongo,2014).Single parenthood could have contributed to non-adherence to immunization schedule due to lack of support.

5.2: CONCLUSION

When verified from the immunization booklet /card, majority (54.9%) of the children had been immunized as scheduled while another large group (45.1%) had not got immunizations as per the schedule. From these findings, it can be concluded that a large group of children do not adhere to immunization schedule. The factors which determined the adherence to immunization schedule were the level of education and marital status of the care giver. The main reasons attributed to non-adherence as mentioned by participants in FGD included: lack of bus fare, employment of the care giver being very demanding, baby's sickness, getting late to the clinic and missing immunization services and care giver forgetting the return date.

The study therefore concluded that in order to improve adherence to immunization schedule, the following factors need to be considered:

1. The enabling factors to current strategies of improving adherence to immunization schedule were:

- Having more health facilities near residential areas to avoid travelling long distances to seek immunization services.

-Using text messages reminders a day before the clinic date to remind care givers on the due date for the clinic

- Constant availability of vaccines

2. Barriers to current strategies of improving adherence to immunization schedule

The study found the following as barriers to adherence to immunization schedule:

Employment of the care giver, their home was far from health facility, baby's sickness and vaccine stock-outs.

3. Findings on the feasible strategies focusing on care giver as reported by most care givers showed that caregivers mentioned forgetfulness due to preoccupation with other activities as a hindrance to adherence to immunization schedule. They should get a better way of remembering the clinic date like phone alarm reminder instead of referring to the immunization booklet.

4. The study found that the achievable strategies focusing on health system that will improve adherence to immunization schedule were:

- Immunization clinics should run for more hours in a day (Flexible clinic hours).

- Availability of vaccines on daily basis

- Phone call reminders by health care providers.

- Creating awareness on the importance of vaccinations as mentioned by one key informant.

5.3: RECOMMENDATIONS

5.3.1: RECOMMENDATIONS

The researcher proposes that there is need to put in place strategies found in the study that would improve adherence to immunization schedule:

1. Text message reminders. The health institutions should put in place mechanisms of reminding the caregivers on the return date using text messages. This will solve the problem of forgetfulness by the care giver.
2. Flexible clinic hours will allow a good number of children to get immunized. Health care providers working in the immunization clinics should get a way of ensuring that all children who come to the clinic are immunized without compromising the cold chain.
3. Consideration of having more government health facilities near residential areas. Some FGD respondents reported lack of government health facilities near them .This will prevent the long distance travel by some caregivers to get affordable immunization services.
4. Health care providers should create awareness of importance of keeping appointments by caregivers.

5.3.2: RECOMMENDATIONS FOR FURTHER RESEARCH

1. There is need for more research to be done regarding the reasons why care givers prefer travelling for long distances to seek immunization services at Kenyatta National Hospital.

2. There is need for a follow up research to find out if the strategies found in the research are achievable.

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APPENDICES

APPENDIX 1: WORK PLAN

	PERIOD									
	2018	2018	2019	2019	2019	2019	2019	2019	2019	2019
ACTIVITY / MONTH	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
Problem Identification, Literature review and Proposal writing										
Presentation to KNH/UON Ethics and Research Committee										
Selection and training of Research assistants										
Pretesting of Research Questionnaire										
Data collection, Processing and analysis										
Final Research writing and presentation to the School of Nursing										
Dissemination to the external examiner										
Final oral defense										
Information Dissemination										

APPENDIX 2: BUDGET

ITEM	UNIT COST Ksh.	QUANTITY	COST	TOTAL
A:PERSONEL/HUMAN RESOURCE				
Ethical Committee review fee	2000.00	1	2000.00	
Research Assistants training	1000.00	1	1000.00	
Research Assistants allowance (Pretesting)	1000.00	1	1000.00	
Investigator allowance on Pretesting	1500.00	1	1500.00	
Allowance for Biostatistician for whole period of Research	30,000.00	1	30,000.00	
Allowance for investigator for whole period of Research	25,000.00	1	25,000.00	
Allowance for Research Assistants for whole period of Data Collection	10,000.00	1	10,000.00	
Subtotal				70,500
B: MATERIALS AND SUPPLIES				
USB Flash disc	1500.00	1	1500.00	
Ball Pens	200.00	1 doz	200.00	
Pencils	100.00	1 doz	100.00	
Erasers	20.00	2 pieces	40.00	
Stapler and staple pins	500.00	1 pair	500.00	
Calculator	2000.00	1	2000.00	
Paper punch	300.00	1	300.00	
Printing papers	500.00	2Rm	1000.00	
Foolscap papers	500.00	1Rm	500.00	
Subtotal				6,140.00
C: PROPOSAL AND THESIS				
Proposal typing and printing	20.00	80 pages	1600.00	
Proposal photocopying	160.00	3 copies	480.00	
Questionnaire photocopying	2.00	242 copies x 7 pages	3,388.00	
FGD Guide photocopying	2.00	2 pages	4.00	
KPI Guide photocopying	2.00	2 pages	4.00	
Final Report typing and printing	20.00	100 pages	2,000.00	
Final report photocopying	2.00	3 copies x 100 pages	600.00	
Report binding	200.00	4 copies	800.00	
Sub- total				8,876.00
Total				85516.00
Contingency (15% of total cost)				12827.40
Grand Total				**98,343.40**

APPENDIX 3A: PARTICIPANT/ CARETAKER INFORMATION SHEET

Hello! My name is Esther, a nursing student from the University of Nairobi. I am conducting a study entitled: **Exploring strategies to improve adherence to immunization schedule among children less 24 months attending Maternal and Child Health Clinic at Kenyatta National Teaching and Referral Hospital, Nairobi.** I would like to invite you to take part in the research study. If you agree to join the study, you will be requested to answer various questions in the questionnaire which will be provided to you.

The purpose of the study is to identify parental and health institution factors that contribute to non- adherence to immunization schedule and therefore provide a guide to explore strategies that will improve adherence to immunization schedule; and eventually reducing possibility of childhood immunizable diseases.

The information you give will guide policy and decision making on ways of averting non-adherence to immunization schedule in order to reduce chances of children getting vaccine preventable diseases. There is neither cost nor compensation for participation.

Your response will be confidential and will be used solely for the purpose of this study. Your name will not be recorded in the questionnaire notes. Each questionnaire will have a serial number and the reason for this is to maintain confidentiality therefore the findings cannot be linked to any person. Filling the questionnaire will take 15-20 minutes.

You are free to decide if you want to be in this study or not. Your decision will not be used against you in any way. If you choose to take part, you can change your mind at any time without any repercussions to your future follow up care at the hospital. If there are any questions, complaints or concerns kindly contact the principal investigator Esther Muathe on 0722823974

or Email Address at estermuathe@yahoo.com or Chairman KNH/UON- ERC Box 20723 KNH, Tel 2726300-9 Ext 44102, Email: uon/knh_erc@uoni.ac.ke. This study has been approved by the Research and Ethics Committee of University of Nairobi and Kenyatta National Hospital.

KIAMBATISHO 3B: FOMU YA MAELEZO KUHUSU IDHINI

Hujambo! Jina langu Naitwa Esther, Mwanfunzi wa Uuguzi Chuo Kikuu cha Nairobi. Ninafanya utafiti wenye kichwa**: Kuchunguza mikakati ya kuboresha utekelezaji wa ratiba ya chanjo miongo mwa watoto chini ya miezi 24 wanahudhuria kliniki ya afya ya uzazi na watoto katika Hospitali ya Kitaifa ya Kenyatta.**

Napenda kukukaribisha kushiriki katika utafiti. Ikiwa unakubali kujiunga na utafiti, utaombwa kujibu maswali mbalimbali katika dodoso ambayo itatolewa kwako.

Ikiwa utakubali kushiriki, tafadhali weka sahihi kwenye fomu hii. Iwapo kuna jambo lolote ambalo hulielewi katika fomu hii, tafadhali uliza na tutaelezea.

Lengo la utafiti huu ni kutambua mambo ya wazazi na ya taasisi ambayo yanachangia kutoweka kwa ratiba ya chanjo na kwa hiyo kutoa mwongozo ya kuchunguza mikakati ambayo itaimarisha utekelezaji wa ratiba ya chanjo, na hatimaye kupunguza uwezekano wa magonjwa ya kinga ya utoto. Hakuna gharama wala fidia kwa kushiriki.

Taarifa ambayo utatupa itaongoza sera na uamuzi juu ya njia za kuzuia uhaba usiofaa kwa ratiba ya chanjo ili kupunguza nafasi ya watoto kupata magonjwa.

Jibu lako litakuwa la siri na litatumiwa tu kwa kusudi la utafiti huu.Jina lako halitaandikwa kwenye maelezo ya maswali. Daftari itawekwa alama na nambari kwa madhumuni ya kudumisha siri kwa hivyo matokeo hayawezi kuunganishwa na mtu yeyote. Maelezo unayotoa yatakuwa ya siri kwa kuwa hakuna mtu atakayeyahusisha na wewe. Kujaza dodoso utachukuwa dakika 15 hadi 20.

Uko huru kuamua ikiwa utapenda kuhusishwa kwa utafiti hii au la. Uamuzi wako hautatumika dhidi yako kwa njia yoyote. Ukiamua kuhusika unaweza kubadili nia wakati wowote na hi haitaadhiri huduma ya afya kwako au kufuatiliwa katika hospitali.Ikiwa kuna maswali yoyote,malalamiko au wasisi tafadhali wasiliana na mtafiti mkuu: Esther Muathe; Rununu 0722823974 ama Barua pepe:estermuathe@yahoo.comamaMwenyekiti, KNH/UON- ERC Box 20723 KNH, Tel 2726300-9 Ext 44102, Email: uon/knh_erc@uoni.ac.ke.Utafiti umekubaliwa na kamati ya Utafiti na Maadili ya Chuo Kikuu cha Nairobi na Hospitali ya Kitaifa ya Kenyatta.

APPENDIX 3C: PARTICIPANT/ PARENT INFORMED CONSENT

Participant's Agreement

1. The above information document describing the research, my rights, benefits, risks and procedures for the study on "**Exploring strategies to improve adherence to immunization schedule among children less 24 months attending Maternal and Child Health Clinic at Kenyatta National Teaching and Referral Hospital, Nairobi"** has been read and explained to me.

2. I have been given an opportunity to have any questions about the research answered to my satisfaction.

3. I fully understand that my participation is purely voluntary and I am free not to take part in the study without giving any reasons and without affecting my follow-up clinics/ medical care or legal rights.

4. I understand that the information will be kept confidential by the study team.

5. I freely and willingly consent to participate voluntarily.

_____ _____

Respondent's Signature Date

I certify that the nature, purpose and the potential benefits associated with participating in this research have been explained to the above participant whose code number is_____

_____ _____

Investigator's/ research assistant's Signature Date

KIAMBATISHO 3D: FOMU YA KUTOA IDHINI KUSHIRIKI

Mkataba wa mshiriki

1. Hati ya Habari iliyotangulia inayoelezea utafiti, haki zangu, faida, hatari na na taratibu ya utafiti; **Kuchunguza mikakati ya kuboresha utekelezaji wa ratiba ya chanjo miongo mwa watoto chini ya miezi 24 wanahudhuria kliniki ya afya ya uzazi na watoto katika Hospitali ya Kitaifa ya Kenyatta, imesomwa kwangu na nikaelewa**.

2. Nimepewa nafasi nipate majibu ya maswali yote kuhusu utafiti.

3. Ninaelewa Kabisa kuwa kuhusika kwangu ni kujitolea na niko huru kutohusika kwa utafiti bila kupeana sababu zozote na pia haitadhoofisha utabibu wangu au haki za kisheria.

4. Ninaelewa kuwa hii Habari itawekwa siri na kundi la utafiti.

5. Mimi kwa hiari nimekubali kushiriki.

…… …….

Sahihi ya Mhojiwa Tarehe

Ninadhibitisha kwamba asili, madhumuni na faida zinazohusiana na kushiriki katika utafiti huu zimeelezwa kwa mshiriki hapo juu ambapo nambari ya msimbo ni ……..

…… …….

Sahihi ya mtafiti/ Msaidizi wa utafiti Tarehe

APPPENDIX 3E: PARTICIPANTS FOCUSED GROUP DISCUSSION CONSENT FORM

My name is Esther Muathe. I am a Nursing student at the University of Nairobi, School of Nursing Sciences. I am pursuing a Masters degree course in Paediatric nursing. I am conducting a research study on "**Exploring strategies to improve adherence to immunization schedule among children less 24 months attending Maternal and Child Health Clinic at Kenyatta National Teaching and Referral Hospital, Nairobi"** This study is for the award of the degree of Master of Science in Nursing (Paediatrics). I encourage you to participate freely and contribute your views and ideas as much as possible.

The information gathered will be treated as a group contribution and will be strictly confidential. The information will be highly valuable to the research and will help in holistic proactive approach towards the prevention of morbidity and mortality from childhood immunizable diseases.

The will to participate is absolutely voluntary and all rights will be guaranteed... In case you would like to know the results of this study, please do not hesitate to contact the following:

1. Esther Muathe Cell Phone No. 0722823974
2. Chairman KNH/UON- ERC Box 20723 KNH Tel 2726300-9 Ext 44102

We do hereby provide informed consent to take part in the study. We have been explained the nature the nature of the study and its purpose.

Participants Signature	Date	Participants Signature	Date
1…….	…….	6. …….	……...

2.. …… ……. 7…….. ……...

3…… ……. 8……. ……...

4…… ……... 9…….. ……...

5…… …… 10……. ……..

Principle investigator/ Research assistant Name ---------- Signature ----------

APPENDIX 4A: STUDY QUESTIONNAIRE

STUDY TITLE: Exploring strategies to improve adherence to immunization schedule among children under 24 months attending the Maternal and Child Health clinic at Kenyatta National Teaching and Referral hospital

DATE OF INTERVIEW_____

CODE OF PARTICIPANT: _____

REASON FOR VISIT (a) Immunization [ ] (b) Growth and development monitoring [ ]

INSTRUCTIONS

Please fill in the questions to the best of your knowledge.

All answers will be treated with confidentiality and used only for improving service delivery. Do not write your name.

PART 1: SOCIAL DEMOGRAPHIC DATA

1.1 Parent/ Caregiver Social Demographic data.

1. What is your relationship with the child?

(a)Mother [ ] (b) Father [ ] (c) Guardian [ ]

(d) Other_____

2. How old are you?

(a) Below 20 years [ ] (b) 20-25 years [ ] (c) 26-30 years [ ] (d) 31- 49 years [ ]
(e) Above 49 years [ ]

3 .Where do you live? (a) County_____ (b) Village /Estate_____

4. What is your marital status?

(a)Single [ ] (b) Married [ ] (c) Widowed [ ] (d) Separated/ Divorced [ ]

5. What is your highest level of education?

(a) Primary level [ ] (b) Secondary level [ ] (c) College/ University level [ ]

(e) Have no formal education [ ]

6. What is your occupation?

(a)Student [ ] (b) Housewife/ Not working [ ] (c) Casual laborer [ ]

(d) Self-employed [ ] [e] Salaried employment [ ]

7. What is your gross income per month?

(a) <10,000 [ ] (b) 11,000-20,000 [ ] (c) 21,000-30,000 [ ]

(d) 31,000-40,000 [ ] (e) > 40,000 [ ]

8. How much time do you take to reach the nearest immunization clinic from home?

(a) < 1 hour [ ] (b) 2-3 hours [ ] (c) 4-5 hours [ ] (d)> 5 hours [ ]

9. How much money do you use as bus fare to reach home?

(a) < 100/-[ ] (b) 100-200/- [ ] [c] above 200/- [ ] [d] Private means [ ]

1:2 Child demographics

Kindly respond to the following questions

1. How old is your child?

(a) 6 weeks - < 3 months [ ] (b) 3 months- < 6 months [ ] (c) 6 months-< 12 months [ ]

(d) 12 months- 24 months [ ]

2. What is the gender of your child?

(a) Male [ ] (b) Female [ ]

3. Where was the child delivered?

(a). Hospital [ ] (b). At home [ ] (c) Don't know [ ]

PART 2: CHILD IMMUNIZATION STATUS

1. Which vaccinations has your child had? Refer to the immunization card/ booklet

vaccine	**Ages of administration of routine immunization services**
BCG	At birth [ ] at first contact [ ]
Oral Polio vaccine (OPV)	At birth [ ]6 weeks [ ]10 weeks [ ] 14 weeks[ ]
DPT-Hep B-Hib (Pentavalent)	6 weeks [ ]10 weeks[ ] 14 weeks[ ]
Pneumococcal vaccine(PCV 10)	6 weeks [ ]10 weeks [ ] 14 weeks [ ]
Rota virus vaccine	6 weeks[ ]10 weeks[ ]
Injectable Polio vaccine (IPV)	14 weeks [ ]
Measles /Rubella vaccine	9 months [ ]18 months[ ]

2. Source of information:

(a). Immunization card/booklet [ ] (b). Verbal report [ ]

3. Did the child get the immunizations as scheduled? Refer to the immunization card/ booklet.

(a) Yes **[]** (b) No [ ]

4. If the child did not get immunizations as per the schedule, what is the reason?

5. Do you receive adequate information concerning immunization schedule?

a) Yes [ ] b) No [ ]

6. If "No", what do you think was the hindrance?

_____

7. Have you ever been turned away without your child getting immunizations?

(a) Yes [ ] (b) No [ ]

8. If "yes" What made you to be turned away?

(a) I came late to the clinic [ ] (b) There were no vaccines [ ] (c) My baby was sick [ ]

(d)Other reason (specify) _____

9. Has your child at any occasion missed immunization on the scheduled date?

a) Yes [ ] b) No [ ]

10. If "yes" What is the reason for the missed schedule?

(a) I was at work [ ] (b) I had travelled [ ] (c) My baby was sick [ ]

(d)Other reason (specify) _____

11. What helps you to remember the clinic date?

(a) Diary [ ] (b) phone reminder [ ] (c) keep referring to return date in the immunization card [ ]

(d) Others (specify) _____

12. Please give suggestions on how we can improve on adherence to immunization schedule

(a) Phone call reminders [ ] (b) Clinic to run for more hours per day [ ]

(c) Vaccines to be available always [ ] (d) Pay us visits in our homes [ ]

(e) Others (specify) _____

13. In your own opinion, what do you think are the barriers to adherence to immunization schedule?

(a) Vaccine stock outs [ ] (b) Baby' sickness [ ] (c) Home far from Health facility [ ]

(d) My employment [ ]

(e) Others (specify) _____

14. Give recommendations that would help improve adherence to immunization schedule.

(a) Remind me on return date using text messages

(b) Vaccines should be available in the clinic always

(c) There should be more health facilities near the residential areas

(d) Others (specify) _____

The End

THANK YOU

KIAMBATISHO 4B: JARIDA LA MASWALI

KICHWA CHA UTAFITI: Kuchunguza mikakati ya kuboresha utekelezaji wa ratiba ya chanjo miongo mwa watoto chini ya miezi 24 wanahudhuria kliniki ya afya ya uzazi na watoto katika Hospitali ya Kitaifa ya Kenyatta.

TAREHE YA MAHOJIANO: _____

NUMBARI YA MSHIRIKI: _____

Sababu ya kutembelea kliniki(a) Kupata Chanjo [ ] (b)Ufuatiliaji ya ukuaji wa mtoto [ ]

MAELEKEZO

Tafadhali jaza maswali kwa kadri ya ujuzi wako

Majibu yote yatashughulikiwa kwa kisiri na yatatumiwa tu kuboresha utoaji wa huduma
Usiandike jina lako.

SEHEMU 1: DATA YA KIJAMII

1.2 Data ya kijamii ya Mzazi/ Mlezi

1. Uhusiano wako na motto ni nini?

(a) Mama [](b) Baba [ ] (c) Mlezi [ ]

(d) Ingine_____

2. Una umri wa miaka mingapi?

(a) Chini ya miaka 20 [ ] (b) Miaka 20-25 [ ] (c) Miaka 26-30 [ ]

(d) Miaka 31- 49 [ ] (e) Zaidi ya miaka 49 [ ]

3 .Unaishi wapi? (a) Kaunti_____ (b) Kijiji/Majengo_____

4. Hali yako ya ndoa ni gani?(a)Sijaolewa/Sijaoa [ ] (b) Nimeolewa/ Nimeoa [ ] (c) Mjane [ ] (d) Tumetengana/ Tumetalakiana [ ]

5. Kiwango chako zaidi cha masomo ni gani?

(a) Shule ya msingi [ ] (b) Shule ya sekondari [ ] (c) Chuo/ Chuo kikuu [ ]

(e) Sina elimu ya kawaida [ ]

6. Unafanya kazi gani?

(a) Mwanafunzi [ ] (b) Mke nyumbani/ Sifanyi kazi [ ] (c) Kazi ya kibarua [ ]

(d) Nimejiajiri [ ] (e)Nineajiriwa [ ]

7. Mapato yako ya jumla kwa mwezi ni ngapi?

(a) Chini ya sh.10, 000 [ ] (b) sh.10, 000 hadi sh.20, 000 [ ]

(c) Sh21, 000hadi 30,000 [ ](d) Sh.31, 000 hadi 40,000 [ ] (e) Zaidi ya 40,000 [ ]

8. Unatumia muda wa masaa mangapi kutoka nyumbani hadi kliniki iliyo karibu na kwenu?

(a) Chini ya saa moja[ ] (b) Masaa mawili hadi tatu [ ]

(c) Masaa manne hadi tano [ ] (d) Zaidi ya masaa tano [ ]

9. Nauli hadi nyumbani kwako ni pesa ngapi?

(a) Chini ya sh.100 [ ] (b) Sh.100-200 [ ]

(c) Zaidi ya sh. 200 [ ] (d) Gari la kibinafsi [ ]

1:2 Maelezo ya mtoto

Tafadhali jibu maswali yafuatayo

1. Mtoto wako ana umri gani?

(a) Wiki 6 hadi chini ya miezi 3 [ ] (b) Miezi 3 hadi chini ya miezi 6 [ ]

(c) Miezi 6 hadi chini ya miezi 12 [ ](d) Miezi 12 hadi miezi 24 [ ]

2.Je,Mtoto wako ni wa jinsia gani?(a) Kiume [ ] (b) Kike [ ]

3. Je, mtoto alizaliwa wapi?

(a). Hospitali[ ] (b). Nyumbani[ ] (c) Sijui[ ]

PART 2: HALI YA CHANJO YA MTOTO

1. Mtoto wako amepata chanjo zipi? Angalia kwenye kadi ya chanjo/ kitabu

Chanjo	**Umri wa kupata huduma za kawaida za chanjo**
BCG (Chanjo ya kuzuia kifua kikuu)	Anapozaliwa [ ] Baadaye [ ]
Chanjo ya kuzuia ugonjwa wa kupooza	Anapozaliwa [ ] Wiki 6 [ ] Wiki 10 [ ] Wiki 14 [ ]
Chanjo ya Pentavalent (DPT-Hep B-Hib)	Wiki 6 [ ] Wiki 10 [ ] Wiki 14 [ ]
Chanjo ya kuzuia homa ya mapafu(Pneumococcal vaccine)	Wiki 6 [ ] Wiki 10 [ ] Wiki 14 [ ]
Chanjo ya kuzuia kuhara (Rota virus)	Wiki 6 [ ] Wiki 10 [ ]
Chanjo ya Polio ya kudunga (Injectable Polio vaccine)	Wiki 14 [ ]
Chanjo ya kuzuia ukambi	Miezi 9 [ ] Miezi 18[ ]

2. Chanzo cha maelezo/ Habari:

(a). Kadi ya chanjo/ kitabu[ ] (b). Ripoti ya mdomo/Maelezo [ ]

3. Je, mtoto wako alipata chanjo kama ilivyopangwa? Angalia kwa kadi ya chanjo/ kitabu.

(a) Ndiyo **[ ]**(b) La [ ]

4. Ikiwa mtoto hakupata chanjo ilivyopangwa, Je, sababu ni nini?

5. Je, unapata maelezo ya kutosha kuhusu mpangilio wa chanjo?

a) Ndiyo[ ] b) La[ ]

6. Ikiwa jibu lako ni “La”, Je unadhani kizuizi ni nini?

_____

7. Je, kuna wakati umerudishwa nyumbani bila mtoto wako kupata chanjo?

(a) Ndiyo[ ](b) La[ ]

8. Ikiwa jibu lako ni“Ndiyo” Nini kilisababisha urudishwe?

(a) Nilifika kliniki nikiwa nimechelewa [ ] (b) Hakukuwa na chanjo [ ]

(c) Mtoto alikuwa mgonjwa [ ]

(d) Sababu nyingine (Taja) _____

9. Je kuna wakati umekosa kuleta mtoto wako kwa chanjo katika siku iliyopangwa?

a) Ndiyo[ ] b) La[ ]

10. Ikiwa jibu lako ni“Ndiyo” Je nini ilisababisha hayo?

(a) Nilikuwa kazini [ ] (b) Nilikuwa nimesafiri [ ] (c) Mtoto alikuwa mgonjwa[ ]

(d)Sababu nyingine (Taja) _____

11. Je, nini kinakusaidia kukumbuka siku ya kliniki?

(a) Shajara (Diary) [ ] (b) Mkumbusho wa simu [ ] (c)Ninaangalia siku ya kurudi kwenye kadi ya chanjo mara kwa mara [ ]

(d) Nyingine (Taja) _____

12. Tafadhali toa mapendekezokuhusu jinsi tunavyoweza kuboresha uzingatifu ratiba ya chanjo.

(a) Kukumbushwa kwa kupigiwa simu [ ] (b) Kuongezwa kwa masaa ya kliniki kwa siku [ ]

(c) Chanjo ziwe zinzpatikana daima [ ] (d) Mtutembelee manyumbani mwetu [ ]

(e)) Nyingine (Taja) _____

13. Kwa maoni yako mwenyewe, unadhani ni vikwazo gani yanayo zuia uzingatifu wa ratiba ya chanjo?

(a) Upungufu wa chanjo (kukosekana) [ ] (b) Ugonjwa wa mtoto [ ] (c) Nyumbani ni mbali kutoka hospitalini [ ] (d) Hali ya kikazi [ ]

(e) Zingine (Taja)_____

14. Toa mapendekezo ambayo yatasaidia kuboresha uzingatifu wa ratiba ya chanjo.

(a) Nikumbushe siku ya kurudi kwa kutumia ujumbe wa simu.

(b) Chanjo ziwe zinapatikana katika kliniki kila mara.

(c) Kunapaswa kuwe na vituo vya afya zaidi karibu na maeneo ya makazi.

(d) Zingine (Taja)_____

Mwisho

ASANTE

APPENDIX 4C: FOCUSED GROUP DISCUSSION GUIDE

MOTHERS AT THE MATERNAL AND CHILD HEALTH CLINIC-KNH

STUDY TITLE: Exploring strategies to improve adherence to immunization schedule among children under 24 months attending the Maternal and Child Health clinic at Kenyatta National Teaching and Referral Hospital.

Date: _____

VENUE: KENYATTA NATIONAL HOSPITAL- MATERNAL AND CHILD HEALTHCLINIC

Facilitator: _____

Note taker: _____

Total participants-10.

1. Climate setting

Hello everyone! I take this opportunity to welcome you all to our discussion today.

I do thank each one of you for accepting to be present and contribute to this discussion.

2. Self-introduction

My name is Esther Muathe and I will guide you through the discussion.

3. Introduction of the day's agenda

We are going to discuss about strategies to improve adherence to immunization schedule among children less than 24 months

Feel welcome.

Questions

a) What do you understand by the term immunization?_____

_____

_____

b)Discuss advantages of immunization Services to the baby and the family:_____

_____

d) What prevents you from taking your baby to the clinic as scheduled?

_____

_____

e) How does the distance between home and immunization clinic play any role in preventing

you from attending the immunization schedules _____

f) Is there any relationship between finances and failure to take your baby to the clinic on the scheduled date?

a. Yes [ ] b. No [ ]

If yes, which one?

_____

_____

g) What do you think can help you as care givers get to remember the scheduled date for immunization?

_____

_____

_____

Conclusion

I thank you all for your participation. Your contributions and responses will assist us in solutions to the factors that influence non- completion of immunization schedules.

APPENDIX 4D: KEY INFORMANT INTERVIEW GUIDE

STUDY TITLE: Exploring strategies to improve adherence to immunization schedule among children under 24 months attending the Maternal and Child Health clinic at Kenyatta National Teaching and Referral Hospital.

Date: _____

Time: _____

VENUE : KENYATTA NATIONAL HOSPITAL: Maternal and Child Health clinic

SECTION A

SOCIAL DEMOGRAPHIC DATA:

1). what is your age?

(a) 30-40 [ ] (b) 41-50 [] (c) Above 50 [ ]

2). Gender: (a) Male [ ] b) Female [ ]

3). Designation (a) KRCHN [ ] (b) KECHN [ ]

Level of Education

(a). College [ ] (b). University [ ]

SECTION B

ABOUT CLIENT

4).What is the prevalence of missed immunizations? _____

5).Do all your clinic attendants keep their appointment dates?

a) Yes [ ] b) No [ ]

6).If no, what is the reason? _____

7). Do all your clients complete their childhood immunizations?

a) Yes [ ] b) No [ ]

8) If no, what reason do they give for non-completion of immunizations?

_____

_____

9). Tell me the mechanism you have for reaching out to the clients in order to keep to their clinic scheduled dates?

_____

10) In your own opinion, what do you think are the facilitators of the current strategies of improving the immunization schedule?

_____

_____

11).Point out the barriers of the current strategies of improving the immunization schedule?

_____

_____

11).Give suggestions on how to overcome these barriers.

_____

_____

_____

THANK YOU

APPENDIX 5: REQUEST FOR APPROVAL TO CARRY OUT STUDY

Esther C. Muathe,

University of Nairobi,

School of Nursing Sciences.

Telephone No. 0722823974

Email: estermuathe@yahoo.com

The Chair Person,

Ethics and Research Committee, University of Nairobi and Kenyatta National Hospital,

Dear Sir/Madam,

RE: Request for permission to carry out research study

I am a post- graduate student pursuing Master of Science in Nursing (Pediatrics) at the University of Nairobi. I wish to undertake a study titled 'Exploring strategies to improve adherence to immunization schedule among children under 24 months attending the Maternal and Child Health clinic at Kenyatta National Teaching and Referral hospital'.

I am kindly requesting for your approval to undertake the said study. I am committed to observe and adhere to ethical principles of respect for persons, justice and beneficence.

I look forward to your favorable response.

Yours faithfully,

Esther Cheptanui Muathe

APPENDIX 6: REQUEST FOR PERMISSION TO CARRY OUT STUDY

Esther C. Muathe,

University of Nairobi,

School of Nursing Sciences.

Telephone No. 0722823974.

Email: estermuathe@yahoo.com

January 18th 2019.

The Assistant Director- Paediatric Department,

Kenyatta National Hospital.

Dear Sir/ Madam,

RE: Request for permission to carry out research

I am kindly requesting to undertake the said study in your department. Attached is a copy of the letter of approval from the University of Nairobi and Kenyatta National Hospital Ethics and Research Committee.

I look forward to a positive response.

Yours faithfully,

Esther Cheptanui Muathe.

APPENDIX 7: KNH/UON-ERC APPROVAL

UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
P O BOX 19676 Code 00202
Telegrams: varsity
Tel:(254-020) 2726300 Ext 44355

KNH-UON ERC
Email: uonknh_erc@uonbi.ac.ke
Website: http://www.erc.uonbi.ac.ke
Facebook: https://www.facebook.com/uonknh.erc
Twitter: @UONKNH_ERC https://twitter.com/UONKNH_ERC

KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi

15 APR 2019

Ref: KNH-ERC/A/140

15th April, 2019

Esther Muathe
Reg. No.H56/7450/2017
School of Nursing Sciences
College of Nursing Sciences
University of Nairobi

Dear Esther

RESEARCH PROPOSAL: EXPLORING STRATEGIES TO IMPROVE ADHERENCE TO IMMUNIZATION SCHEDULE AMONG CHILDREN UNDER 24 MONTHS ATTENDING THE MATERNAL AND CHILD HEALTH CLINIC AT KENYATTA NATIONAL TEACHING AD REFERRAL HOSPITAL (P66/02/2019)

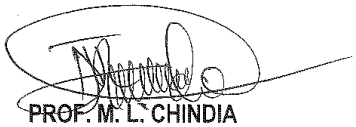
This is to inform you that the KNH- UoN Ethics & Research Committee (KNH- UoN ERC) has reviewed and **approved** your above research proposal. The approval period is 15th April 2019 – 14th April 2020.

This approval is subject to compliance with the following requirements:

a. Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
b. All changes (amendments, deviations, violations etc.) are submitted for review and approval by KNH-UoN ERC before implementation.
c. Death and life threatening problems and serious adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH-UoN ERC within 72 hours of notification.
d. Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH- UoN ERC within 72 hours.
e. Clearance for export of biological specimens must be obtained from KNH- UoN ERC for each batch of shipment.
f. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (*Attach a comprehensive progress report to support the renewal*).
g. Submission of an *executive summary* report within 90 days upon completion of the study. This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/ or plagiarism.

For more details consult the KNH- UoN ERC website **http://www.erc.uonbi.ac.ke**

Yours sincerely,



PROF. M. L. CHINDIA
SECRETARY, KNH-UoN ERC

c.c. The Principal, College of Health Sciences, UoN
The Director, CS, KNH
The Chairperson, KNH- UoN ERC
The Assistant Director, Health Information, KNH
The Director, School of Nursing Sciences,UON
Supervisors: Mrs. Eve Rajula, Mrs. Mary W. Kamau

APPENDIX 8: STUDY REGISTRATION CERTIFICATE

KNH/R&P/FORM/01

KENYATTA NATIONAL HOSPITAL
P.O. Box 20723-00202 Nairobi

Tel.: 2726300/2726450/2726565
Research & Programs: Ext. 44705
Fax: 2725272
Email: knhresearch@gmail.com

Study Registration Certificate

1. Name of the Principal Investigator/Researcher
   ESTHER CHEPTANUI MUATHE
2. Email address: esthermuathe@yahoo.com Tel No. 0722823974
3. Contact person (if different from PI).....
4. Email address: ..... Tel No. .....
5. Study Title
   Exploring Strategies to improve adherence to Immunization Schedule among children Under 24 months attending the Maternal and Child Health clinic KNH
6. Department where the study will be conducted Paediatrics
   (Please attach copy of Abstract)
7. Endorsed by Research Coordinator of the KNH Department where the study will be conducted.
   Name: ..... Signature ..... Date .....
8. Endorsed by KNH Head of Department where study will be conducted.
   Name: Dr D Mwaniki Signature ..... Date 17/04/19
9. KNH UoN Ethics Research Committee approved study number _____
   (Please attach copy of ERC approval)
10. I Esther Cheptanui Muathe commit to submit a report of my study findings to the Department where the study will be conducted and to the Department of Research and Programs.
    Signature ..... Date 16/4/19
11. Study Registration number (Dept/Number/Year) Paeds /189/ 2019
    (To be completed by Research and Programs Department)
12. Research and Program Stamp _____

All studies conducted at Kenyatta National Hospital **must** be registered with the Department of Research and Programs and investigators **must commit** to share results with the hospital.

Version 2: August 2014

APPENDIX 9: AUTHORITY TO COLLECT DATA

KENYATTA NATIONAL HOSPITAL
P.O. BOX 20723, 00202 Nairobi

Tel.: 2726300/2726450/2726550
Fax: 2725272
Email: knhadmin@knh.or.ke

Ref: KNH/PAEDS-HOD/48 Vol.II

Date: 17th April 2019

Esther Muathe
School of Nursing Sciences
College of Heath Sciences
University of Nairobi

Dear Esther

RE: AUTHORITY TO COLLECT DATA IN PAEDIATRICS DEPARTMENT

Following approval by the KNH/UON-Ethics & Research Committee for your Research Proposal and subsequent filing of the Study Registration Certificate, this is to inform you that authority has been granted to collect data in ***Paediatrics Department***, on your study titled ***"Exploring strategies to improve adherence to immunization schedule among children under 24 months attending the Maternal and Child Health clinic at Kenyatta National Hospital"***.

Kindly liaise with the Senior Assistant Chief Nurse Paediatrics for facilitation.

You will also be required to submit a report of your study findings to the Department of Paediatrics after completion of your study.

18/4/19

Dr. Douglas Makewa
Ag. HEAD OF DEPARTMENT, PAEDIATRICS

Cc. Senior Assistant Chief Nurse, Paediatrics

APPENDIX 10: MAP OF KENYATTA NATIONAL HOSPITAL