FACTORS ASSOCIATED WITH IMMUNIZATION DROP- OUT AMONG CHILDREN OF TWO MONTHS TO FIVE YEARS OF AGE IN KWANZA, TRANS-NZOIA DISTRICT, KENYA

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DECLARATION

I hereby confirm that this dissertation is my original work and to the best of my knowledge it has neither been printed nor submitted to any University or institution for the award of Bachelor of Science in nursing or any other qualification.

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Signature……..……

Date……..……

APPROVAL

This work is submitted with my approval

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Date :…….

DEDICATION

I dedicate this work to my parents Mr. Moses Wanyonyi and Mrs. Elicah Wanyonyi, my wife Justin Kapuru and my lovely daughter Joy and Franklin for their love and support and encouragement they have given me.

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TABLE OF CONTENTS

Declaration i

Approval ii

Dedication iii

Acknowledgement iv

Table of contents v

List of tables x

List of abbreviations xi

Operational definitions xii

Abstract xiii

CHAPTER ONE: INTRODUCTION

1.1 Background 1

1.2 Problem statement 3

1.3 Justification of the research 4

1.4 Research objectives 4

1.4.1 General objective 4

1.4.2 Specific objectives 5

1.5 Research questions 5

1.6 Description of the conceptual framework 7

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction 8

2.2 Immunization coverage 8

2.2.1 Vaccination schedule in Kenya 9

2.3 Factors associated with immunization dropout 10

2.3.1 Socio-demographic factors 11

2.3.1.1 Sex of the child 11

2.3.1.2 Birth order 11

2.3.1.3 Place of residence 12

2.3.1.4 Level of education 12

2.3.1.5 Income status of Caregivers/mothers 12

2.4 Health care system factors 12

2.4.1Distance to health facility 12

2.4.2 Health education 13

2.5 Parental/individual factors 13

2.5.1 Knowledge on immunization schedule 13

2.5.2 Perceived importance of vaccination 14

2.6 Importance of child vaccination/immunization 14

CHAPTER THREE: METHODOLOGY

3.1 Introduction 15

3.2 Study area 15

3.3 Study design 15

3.4 Sources of Data 15

3.5 Study population and study participants 16

3.6 Selection Criteria 16

3.6.1 Inclusion criteria 16

3.6.2 Exclusion criteria 16

3.7 Sample size determination 16

3.8 Sampling technique 16

3.9 Sampling procedure 17

3.10 Study variables 17

3.11 Data collection techniques and tools 17

3.12 Plan for data analysis 18

3.13 Quality assurance 18

3.14 Plan for dissemination 18

3.15 Ethical clearance 18

3.16 Limitations of the study 19

CHAPTER FOUR: PRESENTATION OF RESULTS

4.0 Introduction 20

4.1 Socio-demographic characteristics of the respondents. 20

4.1.1 General socio-demographic characteristics of the respondents. 20

4.1.2 Immunization dropout among the respondents (n=288) 21

4.2 Individual related factors of the respondents (n=288).....23

4.3 Health facility related factors 26

CHAPTER FIVE: DISCUSSION OF FINDINGS

5.1 Introduction 29

5.2 Socio-demographic characteristics of the respondents. 29

5.3 Immunization dropout among the respondents (n=288) 30

5.4 Individual related factors associated with immunization dropout.....31

5.5 Health system related factors 33

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion.....35

6.2 Recommendations 35

REFERENCES.....36

APPENDIX I: Consent form.....39

APPENDIX II: Questionnaire. 40

APPENDIX III: Introductory and correspondence 43

LIST OF FIGURES

Figure 1: Conceptual frame work.....6

Figure 2: Immunization dropout among the respondents.....21

Figure 3: Knowledge of side effects of vaccines 24

LIST OF TABLES

Table 1: Immunization schedule proposed by KEPL.....10

Table 2:. General socio-demographic characteristics of the respondents 20

Table 3: Bivariate association of socio-demographic factors associated with immunization dropout.....22

Table 4: Univariate Individual related factors associated with immunization dropout 23

Table 5: Bivariate association of individual related factors and immunization dropout.....25

Table 6:Health facility related factors associated with immunization dropout.....26

Table 7:. Bivariate association of health related factors and immunization dropout.....27

LIST OF ABBREVIATIONS

ANC	-	Antenatal Care
BCG	-	Bacillus Calmette Guerin
DPT	-	Diphtheria, Tetanus and Pertussis Vaccine
DRC	-	Democratic Republic of Congo
EPL	-	Expanded Programmed On Immunization
GAVI	-	Global Alliance for Vaccines and Immunization
HepB	-	Hepatitis B Vaccine
Hib	-	Haemophilus Influenza Type B Vaccine
IMR	-	Infant Mortality Rate
KEPI	-	Kenya Expanded Program on Immunization
KNBS	-	Kenya National Bureau of Statistics
MoH	-	Ministry of Health
OPV	-	Oral Polio Vaccine
OR	-	Odd Ratio
PCV	-	Pneumococcal Vaccine
SPSS	-	Statistical Package for Social Scientists
TB	-	Tuberculosis
TDHS	-	Tanzania demographic health Survey
TT	-	Tetanus Toxiod Vaccine
UNICEF	-	United Nations Children Fund
WHO	-	World Health Organization

OPERATIONAL DEFINITIONS

Immunization dropout	-	A child who has received at least one dose of trivalent vaccine against diphtheria, pertusiss and tetanus (DPT) but failed to receive his or her third dose to complete the schedule before the five years of age.
Access to health facilities	-	Distance of a house hold to facility or affordability of health Services in terms of money.
Care takers	-	A person who is directly taking care of the child.
Under 5 years	-	Children between two months and five years in age groups with the upper limit inclusive.
Socio-Demographic Factors	-	These are individual care taker characteristic with potential to influence immunization drop-out.

ABSTRACT

Introduction

Immunization is the cornerstone of healthcare policy and the most effective tool for the control and prevention of life-threatening infectious diseases.

Objective

Assessed the factors that are associated to immunization drop-out among children of two months to five years of age, in Kwanza division, Trans-nzoia district, Kenya .

Methodology

A cross- sectional study design to collect data on factors associated to immunization drop-out among children of two months to five years of age. A convenient sampling method was adopted to select 288 caretakers into the study. Structured questionnaire was used to collect data and analyzed using SPSS16 version.

Results

The study revealed that out of 288 caretakers interviewed, 65.6%(n=189) were found they didn't complete the immunization schedule. Age of the respondent(p =0.000), marital status (p =0.002), level of education (0.000) ,employment status (p =0.000) ,and monthly income(p =0.000), were significant associated with immunization drop-out among respondent

Conclusion

This study identified factors that are associated with immunization drop- out among children of two months to five years of age in Kwanza, Trans-Nzoia district, Kenya. These include socio-demographic factors, individual or parental related factors and health system related factors. This calls for advanced improved strategies in this district and other districts with similar environmental and social contexts.

Recommendations

Health care workers should improve educational intervention aimed at immunization completion and this will improve routine vaccination completion.

Policy makers should set up immunization sites in remote areas with the intend of providing a greater opportunity for children to access the services by reducing the distance to services.

CHAPTER ONE: INTRODUCTION

1.1 Background

Immunization is the cornerstone of healthcare policy and the most effective tool for the control and prevention of life-threatening infectious diseases. It is estimated that immunization averts 2 to 3 million deaths each year (UNICEF, 2006). In addition, childhood vaccination reduces mortality by 99% against most infectious diseases including smallpox, polio, diphtheria, and measles (McCullers 2007) as well as incalculable economic savings (Hausdorff et al, 2008).

Globally, there are 30 million children who are not routinely immunized every year and 1.5 million children less than five years of age die each year from vaccine preventable disease.
WHO, (2015) estimated that 86% 0f infants globally were vaccinated. In addition, three continents that is Europe, America and western pacific maintained over 90% of DPT(Diphtheria, Tetanus and Pertussis) immunization coverage while 159 countries maintained immunization coverage over 80% of the infants (WHO, 2015).

In United States of America, national immunization survey reported that among children aged 19-35 months coverage of PCV (Pneumococcal Vaccine) was 82.8%, 91.5% MMR coverage while the rest if the other vaccines coverage ranges from 90.7% to 62.9% among different states (CDC, 2005).
The European and pacific regions rank highest with immunization coverage estimated at 96% in those regions while at 75% coverage, the African continent ranks with the lowest coverage followed by South-Eastern Asia with 77% immunization coverage (Manocha, 2014).
The complete immunization coverage in Kenya in 2003 was 57 % and this rose gradually in 2007 to 77%. However, an estimated 35% of newborns had not been immunized in 2006, translating into 0.5 million unvaccinated children within the country. It is also reported that 20% of deaths among children less than five years of age, are caused by measles. In 2006, 1.5 million children were at risk of contracting measles after an increase of confirmed measles outbreaks in 39 districts in Kenya (MoH, Kenya, 2012).

Despite of effort put to improve immunization, over 24,000 children die of immunizable preventable diseases every day around the world with a bigger proportion of these death in

2008, occurring in sub- Saharan Africa (4.4 million) & south Asia (2.8 million) compared to Latin America, the Caribbean (0.2 million) and (0.1 million) in industrialized countries (Bbaale, 2013 pp 121 – 123).Estimated number of all deaths in children under 5 year (0-59 months) in 2008; 8.8 million. Nearly 17 % of all deaths in children aged 5 years is vaccine preventable disease. About 29% of deaths in children 1-59 months of age are vaccine preventable diseases (WHO, 2012).

The Kenya Expanded Program me on Immunization recommends that children receive Bacillus Calmette-Guerin (BCG) and Oral Polio Vaccine (OPV) at birth; three doses of Pentavalent vaccine and OPV at 6, 10 and 14 weeks of age; and measles vaccine at 9 months of age. To reduce morbidity and mortality related to Neonatal Tetanus, at least two doses of tetanus toxoid (TT) vaccine are recommended during pregnancy (Mutua *et al., 2011).* Immunizations are recorded on vaccine cards or booklets obtained from the clinics. Immunization coverage in Trans-nzoia County in 2010 was 66% and a drop-out rate of 10.0% (Maina et al. 2013; moise etal, 2010, Kamau &Esamai, 2001).

According to guidelines developed by the WHO, children are considered fully immunized when they have received a vaccination against tuberculosis (BCG), three doses each of the diphtheria, pertussis, and tetanus (DPT) and polio vaccines and a measles vaccination by the age of 12 months. The pentavalent vaccines DPT-HepB-Hib that protects against diphtheria, pertussis (whooping cough), tetanus, hepatitis B, and Haemophilus influenza type b has replaced the DPT vaccine (WHO, 2006).

Among the 29 sub-Saharan countries surveyed, full childhood immunization coverage varies widely from only 11% of children of ages 12 to 59 Months in Chad to 78% in Zambia. In some countries, missing the third dose of vaccine in the DPT and Polio series is the reason that complete immunization levels are low. Recent estimates indicates that the global DPT immunization coverage of infants is 82% , and 23.5 million children did not receive DPT3 vaccine in 2008(WHO,UNICEF,2008). In Kenya for example, fewer than half of the children received the third DPT and Polio vaccines, although over 77.4% received the first in the series(Kenya National Bureau of Statistics [KNBS], 2009). However proportion varies from 48.3% in the North eastern province to 85.8% in central province. This study is to determine vaccination coverage among children aged 2 to 59 months living in kwanza rural and urban

division, trans-Nzoia district and to identify risk factors associated with incomplete vaccination.

Inadequacies in immunization coverage relate to a number of factors such as the level of sensitization by health workers and lack of political will by political leaders to mobilize and support immunization services (Waisbord, 2004). Other factors are parent acceptability in terms of expected benefits, social mobilization of various elements of society for a common developmental goal, insufficient community participation due to lack of awareness, distance from the health facility, place of delivery, migration of families, mothers knowledge and attitudes towards immunization, weather conditions and low literacy levels of the parents (Cheyne, 1994; Ibnouf, Van den Borne & Maarse, 2007; Kidane & Tekie, 2000; Ndiritu et al., 2006; Sebahat & Nadi, 2006; Singh & Yadav, 2001).

Reasons for this drop-out rate are still not known. This study therefore sought to find out the coverage rate of children aged 5 years in Kaisagat as well as to identify the factors that influence it so as to propose recommendations for interventions and increase the immunization coverage

1.2 Problem statement

The infant mortality rate (IMR) for Kenya is 39 per 1,000 live births. This implies that one in every 39 babies born in Kenya does not live to the first birthday. Immunizable diseases prevention interventions target has not been achieved in the 15 most affected countries, including Kenya, where three-quarters of deaths in children fewer than 5 years occur from the preventable disease each year (Black et al., 2010).

In Trans-nzoia district, its approximated that about 69% of children receive all the basic vaccination by the age of 12 months against the national target of 90%, the low vaccine coverage rates results into a pool of children who are partially or completely unimmunized and therefore putting them at risk of death from vaccine preventable diseases as compared to those fully immunized (Otieno et al.,2012)

Immunization services are freely available in health facilities, Government efforts through child immunization days, sensitization through the media on child immunization and health personnel training all attempt to increase child immunization however, reason for low

coverage or early drop-out in kwanza division ,Trans-Nzoia district are not known and despite the scale up of the vaccination services which are free in public and most of private health institutions coupled with sensitization and mobilization.

Although 20% of Kenyan children 2 -5years of age do not receive all the basic vaccinations on time which puts them at risk of vaccine preventable diseases, little is known about reasons for incomplete immunization. Given the observed low immunization uptake in Kwanza division, it is important to establish factors associated to immunization drop-out among children of two months to 5 years of age in Kwanza division, Trans Nzoia district.

1.3 Justification of the research

- This study will contribute information which can be used by policy makers in the Ministry Of Health (MoH)to create policies that will encourage mothers complete their immunization schedule among children in Kwanza and avoid preventable immunizable diseases
- It will benefit health workers like nurses, doctors or clinicians by giving useful data on the factors associated with immunization drop out among children of two months to 5 years of age in Kwanza
- The study will help to strengthen the relationship between the Ministry Of Health and the partner organizational role in the scale of immunization services in Kwanza
- The study findings will be used by other researchers to identify the factors that associate with immunization dropout among children of two months to five years in Kwanza ,Trans-Nzoia district ,other areas of the Kenya.
- After completion of the study, it will lead to the researcher's award of bachelor's degree in Nursing sciences of International Health Sciences University.

1.4 Research objectives

1.4.1 General objective

To determine the factors that are associated with immunization drop- out among children of two months to five year of age, in Kwanza division, Trans-nzoia district, Kenya during June to July 2016.

1.4.2 Specific objectives

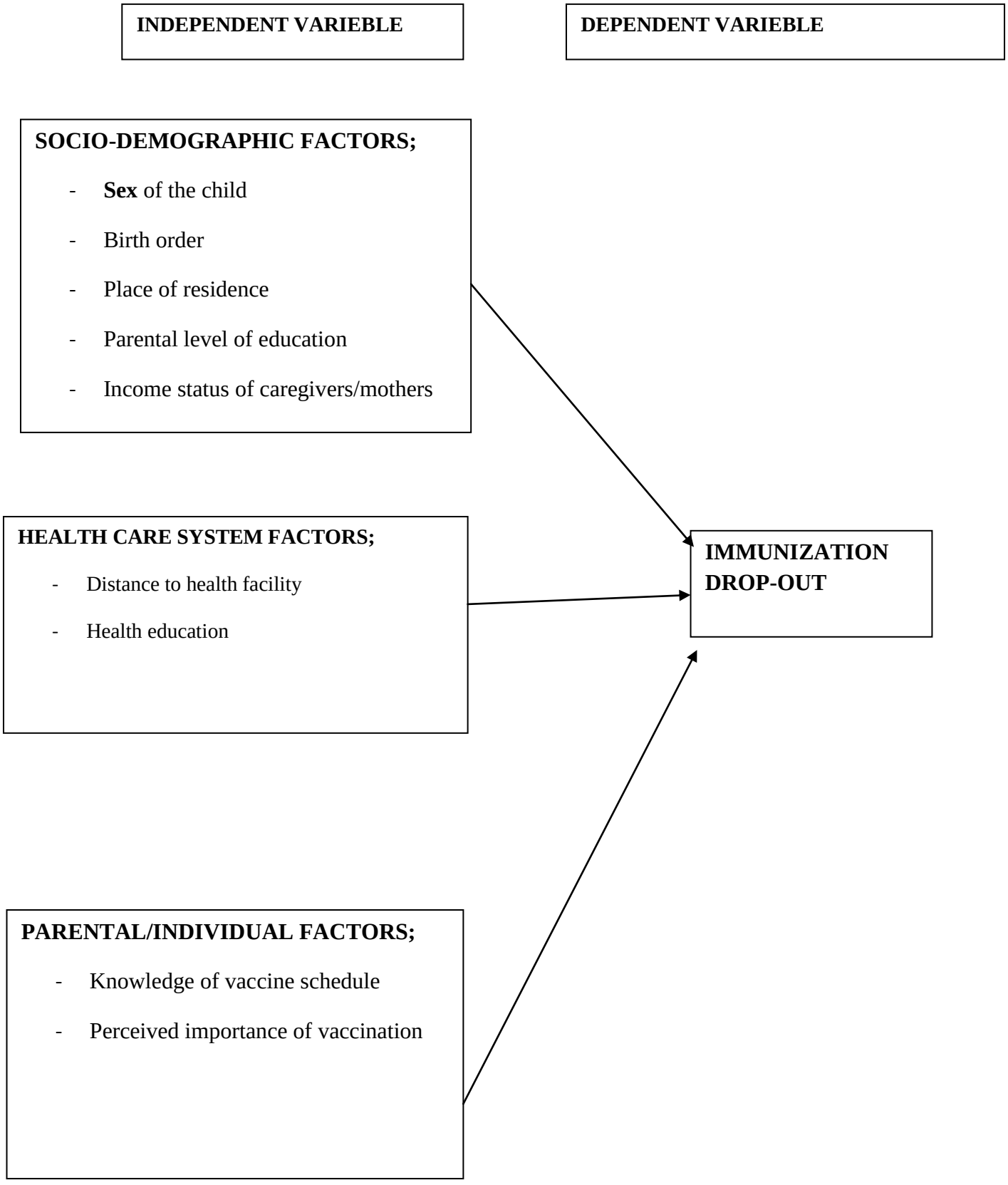
This study will be directed or guided by the following specific objectives;

- To establish the socio-demographic factors associated with immunization drop-out among children aged 2 months to 5 years in kwanza division
- To identify to identify health system factors associated with immunization drop-out
- To identify the parental or individual factors associated with immunization drop-out

1.5 Research questions

- What are socio-demographic factors associated with immunization drop-out among children aged 2months to 5years in Kwanza division during June to July 2016?
- What health system factors associated with immunization drop-out among children aged 2months to 5years during June to July 2016?
- What are parental or personal factors associated with immunization drop-out among children aged 2month to 5years during June to July 2016?

Figure 1: Conceptual frame work



1.6 Description of the conceptual framework

The dependent variable is immunization dropout among children aged two months to five years in kwanza division in Trans-Nzoia district, Kenya. The independent variables that affect immunization dropout include:- health care system factors like Distance to health facility, Availability of health worker, Attitudes of health worker, Health education, Long waiting time ,Socio-demographic factors like Sex of caretakers, Religion, Place of residence, Parental level of education, Age of caretakers, Number of children, Marital status, Employment . Parental /individual factors like Vaccine safety and side effects, Attitudes towards vaccine, Knowledge of vaccine schedule, Perceived importance of vaccination.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter will review literature related to immunization services dropout .Immunization is vital in child growth. However there are factors affecting their coverage. It will look at relevant literature about immunization coverage, knowledge of the caretaker, personal factors and health care system factors. It will include literature from text books, journals, periodicals and official reports, with the aim of identifying factors associated with immunization drop-out.

2.2 Immunization coverage

Overall immunization coverage is the proportion of newborns that an immunization system brings in for the first immunization schedule to the proportion of those children who eventually complete all immunizations recommended by the country in question (WHO, 2006). According to WHO, completion of three doses of DPT vaccine is the measure of immunization coverage levels while dropout rate of an immunization system is measured by dropout rate between DPT1 and DPT3 coverage rates (WHO, 2006).

According to UNICEF (2014), 22.6 million children under 1year of age did not receive DPT3 vaccine worldwide in 2012 compared to 22.3 million in 2012 and more than 70% live in ten countries including Kenya and an estimated 86% of the unvaccinated children live in countries eligible for funding from GAVI alliance and 75% live in just 10 countries in Africa and Asia. These countries include India with close to 10 million unimmunized children, Nigeria, China, Indonesia as well as Bangladesh, DRC, Ethiopia, Niger, Pakistan and Kenya. This is due to the large number of children born in these countries or low vaccine coverage (WHO, 2008). Vaccination preventable diseases account for about a quarter of 8million deaths occurring annually among children under five year of age especially in low income countries such as Kenya (UNITED NATIONS, 2011, Levine et al., 2011). Therefore vaccination to children could prevent more than 2 million child deaths each year thus increasing child survival (WHO, 2009).

Timely immunization is importance for reducing disease risk. Delayed infant vaccination or incomplete enlarges the gap between loss of protection from maternal antibodies and full

protection from vaccine induced immunity, negatively affects herd immunity and postpones full protection in infant and children. As a consequence, infants are longer vulnerable to vaccine preventable diseases, such as Bordetella, pertussis and measles contributing to outbreaks of the latter in countries (Siedler, et al., 2002).

Vaccine – preventable diseases are a challenge in most developing countries, especially in sub-Saharan Africa, where it accounts for 25% of the infant deaths. Recent Tanzania demographic health survey (TDHS) for 2010 has shown that proportion of fully immunized is 75% and this is an increase compared to 71% in 1999.where as full immunization reflected a child who have received all antigens, antigen coverage was somehow higher for example children receiving the third dose of DPT/DPT-HB (or DPT-HB-Hib) (88%), polio (85%), and measles (85%).(lyimo,2012). The Zambia demographic and health survey shows that 68% of children aged 12-13 months in Zambia were fully immunized in 2006.

The Ethiopia demographic and health survey show 24.3%. The prevalence of fully immunized children was 24.3 %. Specific vaccination coverage for three doses of DPT, three doses of polio, measles and BCG were 36.5 %, 44.3 %, 55.7 % and 66.3 %, respectively.
Kenya has the lowest immunization coverage in East Africa. With 86 per cent national immunization coverage, Kenya has the lowest number of fully immunized children in East Africa compared to Tanzania which has 92 per cent (according to daily monitor November 18, 2015) against the 90 per cent target of the global immunization vision and strategy.
Uganda has the top lowest immunization coverage in East Africa with 55 per cent, followed by Rwanda with 55 per cent, Kenya with 82 percent and Tanzania which has 92 per cent .This makes Kenya has the country the third with high infant mortality rate in the region (Otage. S, 2013)

2.2.1 Vaccination schedule in Kenya

According to the Expanded Programme on Immunization (EPI) of Kenya, for immunization to be considered complete, a child has to receive all the vaccine as per immunization schedule shown below. From the table below a child should have received all the vaccinations by the age of one year if protection against vaccine preventable diseases is to be highly achieved but more children continue to miss on this and therefore affecting their health.

Table 1: Immunization schedule proposed by KEPL

VACCINATION SCHEDULE		
Vaccination	Age	Remarks
BCG Polio (Birth)	At birth	At first contact with the child
DPT 1st dose,HeB1,Hib1 Polio (OPV1)	6 weeks (1.5 months)	At first contact of the child after that age
DPT2,HeB2,HIb2 Polio2	10weeks 2.5 months	4 weeks after DPT1 and OPTV1. Can also be given any time after this period, when in contact with child
DPT3 HeB3,Hib3 Polio3	14 weeks 3.5 months	4 weeks after DPT1 and OPV1. Can also be given any time after this period, when in contact with child
MEASLES	9 months	May be given between6 and 9 months if they are admitted To hospital for any other illness. Repeat at 9 months as KEPI Schedule.
Tetanus Toxoid	Pregnant Mothers	2 shots at least 4 weeks apart, as early as possible in pregnancy. One booster dose at every subsequent pregnancy.

Source: Ministry of Public Health and Sanitation, Kenya, (2004).

2.3 Factors associated with immunization dropout

There are several factors known that are associated to immunization dropout or incomplete of immunization schedule of children either directly or indirectly. In low income countries, immunization dropout has been associated with various factors such as parental socio-demographic factors like bigger number of people in household, lower education levels and health facility related factors such as distance to EPI Centers (Anandhi et al., 2000; Bhuiya et al., 1995; Lutwick 2000 and Ughade et al., 2000). Individual factors like mother/caregivers knowledge on immunization (Ray et al, 2004; Sokhey et al., 2001). Therefore these chapter reviews related literature from different scholars related to study topic and its objectives and also demonstrates various gaps that are available in the area.

2.3.1 Socio-demographic factors

Different studies have shown that various socio-demographic factor may have an effect on the child immunization drop out. Sex of the child, religion, place of residence, level of education, age of caretaker, order of the child and marital status are the main factors associated with immunization drop out among children.

Maternal determinants of complete child immunization include mother/caretaker below 30 years, availability of an immunization card at first contact and a birth order of less than three children, completion of at least post-secondary education and maternal unemployment are linked to immunization completion (Ayoola et al., 2011)

2.3.1.1 Sex of the child

Various studies have shown that the sex of the child found to foretell the immunization status of the child in the families in which gender inequality is prevalent. A review done in India from 1996- 2006 showed that girls were found to have significantly lower immunization coverage than boys for BCG, DPT, and measles (Daniel JC at el 2009). In Bangladesh females are 0.84 times less likely to be fully vaccinated than male children (WHO, 2006). In Nigeria in 2003 showed no any significant sex difference. In 2006 Ethiopian EPI survey also showed that no statistically significant difference between girls and boys with regard to their immunization status.

2.3.1.2 Birth order

Birth order has a close relationship with immunization coverage. According to the EDHS 2005 vaccination coverage generally decreases as birth order increases, 27% of first-born children have been fully immunized, compared with 18% of children of birth order six and above.

In a study that assessed factors associated with immunization coverage among children in the first year of life, findings showed that lack of information among parents is a major cause of dropout from immunization (Kumar et al., 2008).

In a study that aimed at determining coverage and various correlates of primary immunization, findings showed that 44% of children were fully immunized and correlates to immunization included higher birth order of the child , illiteracy among mothers (OR=4.0), Muslim religion (OR=4.3) and home delivery among others (Nath et al., 2007).

2.3.1.3 Place of residence

Among other factors associated with immunization dropout is the place of residence in those children from urban areas showed significant role in completion of the immunization. Those from rural areas have a higher immunization dropout as compared to their counterparts living in urban areas (Kumar et al., 2008). However another study reported that place of residence and mother's socio demographic variables were not influencing immunization dropout among children (Etana et al., 2012).

2.3.1.4 Level of education

The mother's education level has significant role in immunization coverage, improvement in female education status would lead to a reduction in immunization dropout rate, mother's with a higher level of education status are more likely to complete the immunization schedule as compared to their ones of low or no formal education (Kumar et al., 2008).

In a study a study that sought to assess immunization in urbanized villages of Delhi, Chhabra et al (2007) noted that literate mothers were 1.4 times more likely to take their children up to full immunization as compare to illiterate mothers however education status of the father was not significantly associated with immunization completion (Chhabra et al., 2007).

2.3.1.5 Income status of Caregivers/mothers

Children living in a household that had a monthly household income of more than fifty US dollars were more likely to complete immunization regarding findings of a cross section study that sought to assess determinants of third dose DPT completion among children F from EPI centers in Pakistan (Usman et al., 2010).

2.4 Health care system factors

2.4.1Distance to health facility

A cohort study that sought to establish determinants of third dose DPT completion among children who received DPT1 at rural EPI centers in Pakistan revealed that participants who stay nearer to the EPI centers are more likely to complete immunization as compare to those who reside more a 10 minutes away distance from the EPI centre (Usman et al., 2010). The researcher concluded that interventions targeting childhood immunization dropouts aiming at bring more children to EPI Centers should deal with relocation centers at appropriate locations by decreasing travel time hence less dropouts.

In a study a study that sought to assess immunization in urbanized villages of Delhi, Chhabra et al (2007) reported that place of birth was significantly associated with complete immunization, in that hospital borne children were two times more likely to complete immunization than those delivered outside a health care facility.

2.4.2 Health education

Providing vaccine related targeted health education to mothers at home and during ANC visits is an effective strategy to improve immunization completion rates in low literacy and income settings (Owais et al., 2011, Dietz et al 1997). Usman et al (2009) reported that there was a 31% increase in DPT3 immunization completion among infants of mothers who received primary healthcare center-based education on their first immunization visit.

In a randomized controlled trial that aimed at assessing the impact of a low literacy immunization promotion education intervention for mothers in low income setting of Karachi on immunization completion, findings after a Poisson regression model to estimate the effect of health education showed that improvement in educational interventions aimed at immunization completion improves routine immunization completion (Owais et al., 2011).

In a study that measured the hepatitis B vaccination uptake in 249 London babies born in 2004 to Hepatitis B positive mothers, findings showed that complete immunization is associated with sector of delivery, having booked for ANC visits and provision of written information on Hepatitis disease and immunization (Isabelle et al., 2009).

2.5 Parental/individual factors

2.5.1 Knowledge on immunization schedule

In cross sectional study done in Ethiopia to assess complete immunization coverage and its correlates in Ambo woreda, Central Ethiopia. Etana et al (2012), after a multivariate logistic regression model noted that immunization dropout or completion was associated with mothers knowledge on age at which vaccination begins (AOR=2.9, CI-95%, 1.9=4.6) and knowledge on the age at which immunization is complete (Etana et al., 2012).

In a randomized controlled trial that aimed at assessing the impact of a low literacy immunization promotion education intervention for mothers in low income setting of Karachi on immunization completion, findings showed that improvement in educational interventions aimed at immunization completion improves routine immunization completion (Owais et al., 2011).

In a survey that enrolled 30 clusters and 3840 households, reasons for immunization dropout included unavailability of both parents, lack of information regarding vaccine administration and on subsequent immunization schedules (Nath et al., 2007).

Mother's knowledge of immunization target diseases, measles immunization schedule and literacy were found to be predicting factors mothers of 12-59 months old children in LAO PDR after regional polio eradication in Western Pacific (Maekawa et al., 2007). Among other correlates; distance to the immunization centre and possession of livestock.

2.5.2 Perceived importance of vaccination

Maternal perception regarding importance of vaccines was significantly associated with higher immunization rates in studies conduction on factors associated with immunization completion in Ethiopia, India and Kenya (Owais et al., 2009; Phukan et al., 2009; Tadesse et al., 2009; Owino et al., 2009).

2.6 Importance of child vaccination/immunization

After effective childhood vaccinations, countries expect very low rates of childhood diseases. Some are given as a combination and others are given as single vaccines like BCG and measles. Improvement on childhood vaccinations and the health care services contributes to significant reductions in infant mortality rates (Ssewanyana & Younger, 2004).

Concerning to World Bank, world development indicates 2015, the infant mortality rate (IMR) for Kenya in 2013 stood at 38/1000 live births compared to 40 /1000 live in 2011. This still makes Kenya have the highest IMR in eastern Africa after Uganda which has 42/1000 live births, Tanzania at 38/1000 live births, Rwanda 35/1000, Burundi 58/1000 live births in 2012. The Sub-Saharan Africa stands at 58.3/1000 live births IMR in 2013. These benefits have contributed to improvement in child survival strategies in immunization and they include lowered IMR are tend to be reviewed if immunization are not followed up, therefore it very important if children completes vaccination.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This section presents the methods used in the study. It includes description of the study area, study design, data sources, study population, sample size determination, sampling procedures, study variables, data collection techniques and tools, data analysis plan, quality assurance issues, plan for dissemination of findings, ethical clearance and limitations of the study. The aim of these methods was to determine the factors that are associated to immunization drop- out among children of two months to five year of age, in Kwanza division, Trans-Nzoia district, Kenya during June to August 2016.

3.2 Study area

The study was conducted in Trans-Nzoia district, Kwanza division. Trans-Nzoia is located in the rift valley province. It is located 380 km North West of Nairobi. Kwanza division is one of the five constituencies that makeup Trans Nzoia district/ county. It has approximately 88727 people living in that area. It is located 15km from Kitale to the main city of Trans Nzoia district and approximately 372 km from Nairobi the capital of Kenya.

3.3 Study design

In this study, a cross sectional study design was used. This is because such a design enables the research to collect data on given research objectives in a short period of time while fulfilling the intended research questions. Quantitative research data collection methods was used to gather data on factors associated with immunization drop- out among children of two months to five years of age in kwanza, Trans-Nzoia district, Kenya. Quantitative methods was used because, they are suitable for collecting data in large quantities and they also enable the research to assess statistical associations between variables of interest hence ascertaining factors associated with a given problem (Polit et al., 2004).

3.4 Sources of Data

Both primary data source and secondary data sources was used to gain information on factors associated with immunization drop- out among children of two months to five years of age in kwanza, Trans-Nzoia district, Kenya. Primary data was obtained from residents of Kwanza division through administering a self-administered questionnaire while secondary data on

immunization was obtained from case reports on immunization, published journal articles and systematic reviews on immunization.

3.5 Study population and study participants

The target population was parents and guardians of children of two months to five years of age residing in Kwanza Division. The accessible population comprised of all parents/ guardians of children aged two months to five years residing in Kwanza division during July to August 2016 fulfilling the selection criteria of this study.

3.6 Selection Criteria

3.6.1 Inclusion criteria

The research considered parents/ guardians of children aged two months to five years residing in Kwanza for more than one year.

Those who were 18 years and above was considered to enroll in the study.

3.6.2 Exclusion criteria

Those who were mentally not health were excluded from the study.

3.7 Sample size determination

The overall sample size was estimated using Kish and Lesley formula (Kish and Lesley, 1965). This formula was used because it is appropriate for determining proportions of a variable in a given population.

$$N= \frac{P\,(1-P)\,Z^2}{ME^2}$$

Where, N= Sample size, Z= 1.96, critical value at a significance level of 95%

M.E= margin of error, 5%

P-average proportion of immunization drop out (TDHS, 2014) = 25%

N= 288.12 Participants

Therefore the numbers of participants were 288 Participants.

3.8 Sampling technique

Purposive sampling technique was used when selecting participants. Every resident of Kwanza division with a child aged between two months to five years was given a questionnaire. Purposive sampling method was utilized because it avails data from

participants who are most suitable in giving data specifically on a given research variable of interest.

3.9 Sampling procedure

Parents/ guardians who were residents of Kwanza division with a child aged between two months to five years was purposively selected and given a questionnaire. Here after the researcher has obtained ethical clearance from both the university and division administration to collect data, the researcher purposively selected eligible participants, introduced him/herself and explained the purpose of the study, then sought informed consent and administered the questionnaire. That was continued until the sample size for this study was achieved.

3.10 Study variables

The dependent variable is immunization drop-out among children aged two months to five years in kwanza division in Trans-Nzoia district, Kenya.

The independent variables that affect immunization drop-out include:- health care system factors like Distance to health facility, Availability of health worker, Attitudes of health worker, Health education, Long waiting time ,Socio-demographic factors like Sex of caretakers, Religion, Place of residence, Parental level of education, Age of caretakers, Number of children, Marital status, Employment . Parental /individual factors like Vaccine safety and side effects, Attitudes towards vaccine, Knowledge of vaccine schedule, Perceived importance of vaccination.

3.11 Data collection techniques and tools

A quantitative researcher- administered questionnaire was used to collect data. The questionnaire had 18 items that allowed to collect on socio-demographic factors, health system related factor and individual factors associated with immunization drop-out.

The questionnaire had three sections, section one assessed socio-demographic factors which included age, gender, level of education, monthly income and marital status. Section two assessed individual/parental factors which included attitudes towards vaccine, knowledge on the immunization schedule and perceived importance, safety and side effects of vaccine.

Section three included 5 items that assessed health care system related factors which included distance to health facility, attitude to health workers and health education provided to parents/ guardians on immunization.

3.12 Plan for data analysis

The tools was checked for completeness, coded and data entered in SPSS. SPSS Version 16.0 was used to analyze the data. Baseline characteristics of the respondents was summarized in tables, graphs and pie-charts. Immunization was categorized into '*complete' and 'drop-out'*. Bivariate associations was then evaluated using Chi-square and spearman's correlation. Logistic regression was finally performed to evaluate the strength of the predictive variables to immunization dropout. A confidence interval of 0.05 was considered in this study.

3.13 Quality assurance

With regards to reliability, variable reliability was done using Cronbach's alpha to assess whether variables measured the intended outcome. Those with alpha more than 70% was considered.

A pilot survey was carried out to pre-test the questionnaire. The pre-test survey was done using 10 people with similar characteristic like the study participants to ensure that the specific questions answer the intended research questions.

Research assistants was trained about the research objectives and procedures. These was done to minimize errors and questionnaire misinterpretations to the participants. For purposes of validity, consistency, accuracy, legibility and completeness: - questionnaires was immediately checked by the researcher at the end of each collection and ensured completeness of very questionnaire. Questionnaires was kept under lock and key for further reference for five years.

The questionnaire was translated to Swahili to control language barrier.

3.14 Plan for dissemination

Research findings were presented to the administration of Kwanza division, interested research participants and the International Health Sciences University, school of nursing for publication. A copy will be availed to the university library. The findings will also be presented on different forums like conferences, seminars and published in different journals.

3.15 Ethical clearance

Ethical clearance was sought from the supervisor, the School of Nursing and the research ethics committee of International Health Sciences University. The researcher/assistants introduced himself/ themselves to respondents, got an informed consent for participation in the study.

The study was entirely for academic purposes; participants voluntarily took part in the study and allowed to exit from the study at any point of the study.

3.16 Limitations of the study

A small sample was used which make the findings not generalizable to the entire population of parents/guardians of children between two months to five years of Kwanza division. Selecting participants using purposive sampling techniques predisposed the study to selection bias.

CHAPTER FOUR: PRESENTATION OF RESULTS

4.0 Introduction

This chapter presents the analysis and presentation of results from the study. The results are presented in line with the study objectives.

Response rate, the study involved 288 participants who were issued questionnaires. All participants fully responded to the questionnaires yielding a 100% response rate.

4.1 Socio-demographic characteristics of the respondents.

4.1.1 General socio-demographic characteristics of the respondents.

Table 2:. General socio-demographic characteristics of the respondents (n=288).

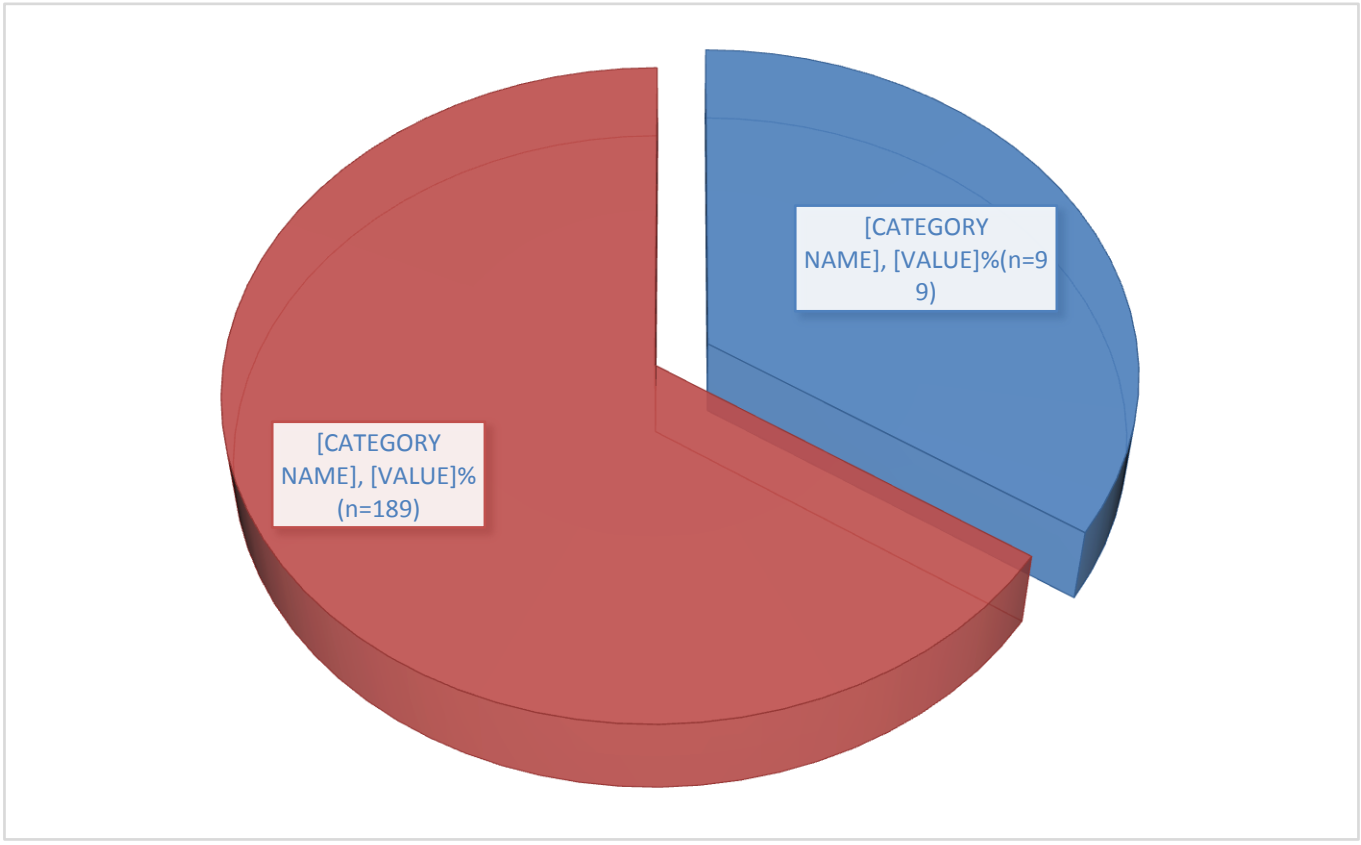
Variables	Categories	Frequency	Percentage
Age	<20	76	26.4
	21-35	151	52.4
	Above 35 years	61	21.2
Gender	Male	62	21.5
	Female	226	78.5
Marital status	Married/cohabiting	251	87.2
	Single	37	12.8
Level of education	No formal education	31	10.8
	Primary	30	10.4
	Secondary	140	48.6
	Tertiary	87	30.2
Employment status	Employed	224	77.8
	Unemployed	64	22.2
Monthly income	<3500kshs	39	13.5
	3500-6000kshs	120	41.7
	6000-15,000kshs	81	28.1
	>15,000kshs	48	16.7

Source: primary field data

The table above shows the socio-demographic characteristics of the respondents, it revealed that majority of the respondents were aged between 21 to 35 years (52.4%), female (78.5%), married/cohabiting (87.2%) and had at least achieved secondary level of education (48.6%). With regards to employment status, more than three thirds of the respondents were employed (77.8%) while most respondents (41.7%) reported that they received between 3500Kshs to 6,000Kshs per month income.

4.1.2 Immunization dropout among the respondents (n=288)

Figure 2: Immunization dropout among the respondents.



Source: primary field data

The proportion of immunization dropout in this study was 65.6% (n=189) while more than a third of the respondents reported that they completed immunization according to the Kenya immunization schedule (34.4%).

Table 3: Bivariate association of socio-demographic factors associated with immunization dropout

Variable	Categories	Immunization status		Chi-square	Degrees of freedom	p-value
		Dropout [n (%)]	Completed [N (%)]			
Age	<20 21-35 Above 35 years	58 (30.7) 83(43.9) 48(25.4)	18(18.2) 68(68.7) 13(13.1)	16.069	*2*	*0.000**
Gender	Male Female	42(22.2) 147(77.8)	20(20.2) 79(79.8)	0.157	1	0.407
Marital status	Married/cohabiting Single	173(91.5) 16(8.5)	78(78.8) 21(21.2)	9.428	1	*0.002**
Level of education	No formal education Primary Secondary Tertiary	31(16.4) 17(9.0) 91(48.1) 50(26.5)	0 13(13.1) 49(49.5) 37(37.4)	1.894	3	*0.000**
Employment status	Employed Unemployed	170(89.9) 19(10.1)	54(54.5) 45(45.5)	47.109	1	*0.000**
Monthly income	<3500kshs 3500-6000kshs 6000-15,000kshs >15,000kshs	35(18.5) 60(31.7) 81(42.9) 13(6.9)	4(4.0) 60(60.6) 0 35(35.4)	97.080	3	*0.000**

The table above shows the bivariate association of immunization dropout and socio-demographic characteristics of the respondents. It revealed that Age of the respondent (X^2=16.069, df=2, p-value= 0.000), Marital status (X^2=9.428, df=1, p-value= 0.002), level of education (X^2=1.894, df=1, p-value= 0.000),), employment status(X^2=47.109, df=1, p-value= 0.000), and monthly income (X^2=97.080, df=3, p-value= 0.000), were significantly associated with immunization dropout among the respondents.

Socio-demographic characteristics such as gender of the respondent were not associated with immunization status of the respondents (X^2=0.157, df=1, p-value= 0.407).

4.2 Individual related factors of the respondents (n=288).

Table 4: Univariate Individual related factors associated with immunization dropout

Variable	Categories	Frequency	Percentages
Immunization of importance	Yes	124	43.1
	No	164	56.9
Preventative value of immunization	Protection against diseases	186	64.6
	Proper child growth	71	24.7
	Not sure	4	1.4
	Others	27	9.4
Awareness of complete immunization schedule	Aware	81	28.1
	Not aware	207	71.9
Know of side effects due to immunization	Yes	179	62.2
	No	109	37.8
Perceived safety of vaccines	Not sure	80	27.8
	They are safe	129	44.8
	Not safe	79	27.4

Source: primary field data

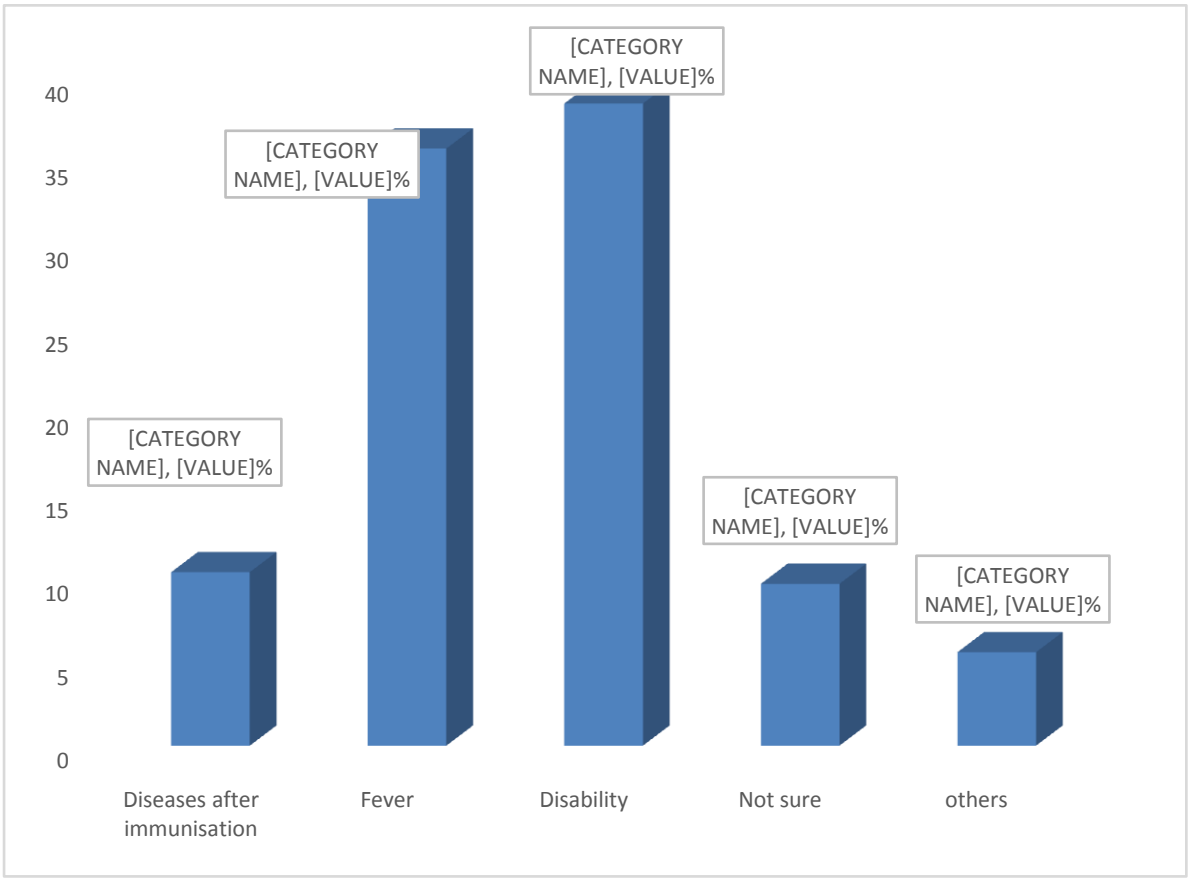
The table above shows that the univariate individual related factors associated with immunization dropout, it shows that most respondents reported that immunization is important, in that most of them perceive that it protects against diseases (64.6%), followed by proper child growth (24.7%), while 1.4% were not sure what the importance of immunization was and 9.4 % reported other importances of immunization.

Regarding awareness of complete immunization schedule, most respondents were not aware of the complete schedule (71.9%), while only less than a third (28.1%) of were aware of the complete schedule.

Majority of the respondents reported that they knew of the side effects of immunization (62.2%) while 37.8% reported that they did not know of any side effect of immunization.

With regards to perceived safety of vaccines, most respondents reported that vaccines are safe (44.8%) followed by those who were not sure whether vaccines are safe while almost a third of them reported that they are not safe (27.4%).

Figure 3: Knowledge of side effects of vaccines



Source: primary field data

The figure above shows the side effects that were reported by the respondents, it shows that most respondents reported that disability was the commonest side effect followed by fever after immunization of the child and diseases.

9.7% of the respondents reported that they were not sure about side effects of vaccines and 5.6% reported other side effects associated with vaccines.

Table 5: Bivariate association of individual related factors and immunization dropout.

Variable	Categories	Immunization status		Chi-square	Degrees of freedom	p-value
		Dropout [n(%)]	Completed [n(%)]			
Immunization of importance	Yes No	73(38.6) 116(61.4)	51(51.5) 48(48.5)	4.403	*1*	*0.045**
Preventative values of immunization	Protection against diseases Proper child growth Not sure Others	122(64.6) 50(26.5) 4(2.1) 13(6.9)	64(64.6) 21(21.2) 0 14(14.1)	6.476 (*fet)*	3	0.091
Awareness of complete immunization schedule	Aware Not aware	81(42.9) 108(57.1)	0 99(100)	59.031 (*fet)*	1	*0.000**
Know of side effects due to immunization	Yes No	103(54.5) 86(45.5)	76(76.8) 23(23.2)	13.698	1	*0.000**
Perceived side effects of vaccines	Diseases after immunization Fever Becoming disabled Not sure Others	16(8.5) 71(37.6) 86(45.5) 12(6.3) 4(2.1)	14(14.1) 32(32.3) 25(25.3) 16(16.2) 12(12.1)	27.561	4	*0.000**
Perceived safety of vaccines	Not sure They are safe Not safe	66(34.9) 63(33.3) 60(31.7)	14(14.1) 66(66.7) 19(19.2)	29.948	2	*0.000**

Bivariate analysis revealed that immunization dropout was significantly associated with individual perceived importance of immunization (p-value=0.045), awareness of the complete immunization schedule (p=0.000), knowing of the side effects of vaccines (p=0.000), and perceived safety of the vaccines (p=0.000). However having knowledge on the importances of immunization was not associated with immunization dropout as shown in the table above (p=0.091).

4.3 Health facility related factors

Table 6:Health facility related factors associated with immunization dropout.

Variable	Categories	Frequency	Percentages
Distance from the health facility	<1km	27	9.4
	2-3km	117	40.6
	>3km	144	50.0
Attitude of health workers	Friendly	186	64.6
	Not friendly	102	35.4
Health education on immunization	Yes	200	69.4
	No	88	30.6
Availability of vaccines	Available	164	56.9
	Not available	124	43.1
Availability of health workers	Available	141	49.0
	Not available	147	51.0
Time spent before seeing health workers	<1 hour	38	13.2
	2hours	115	39.9
	2-5 hours	92	31.9
	More than 5 hours	43	14.9

Source: primary field data

From the table above, most respondents stay more than 3 kilometers from the immunization centres, followed by those who reside 2-3 km from the health facility. Most respondents reported that health providers are friendly while a third of the respondents reported that health service providers are friendly at the health facilities.

With respect to provision of health education on immunization, majority of the respondents reported that they receive health education on immunization at the health facilities while a third of them reported that they don't receive health education on immunization at the health facilities.

Regarding availability of vaccines and health workers at the health facilities, most respondents reported that vaccines are available (56.9%), while more than a third (43.1%) reported that vaccines are not always available at the health facilities. More than a half of the respondents reported that health worker are not always available at the health facilities while 49% reported that they are available.

Majority of the respondents reported that they spend 2 hours (39.9) while waiting for immunization services followed by 2-5 hours (31.9%). 14.9% (n=43) of the them reported that they spend more than 5 hours while only less than a third 13.2% (n=38) reported that they spend less than 1hour while waiting for immunization at the health facility.

Table 7:. Bivariate association of health related factors and immunization dropout

Variable	Categories	Immunization status		Chi-square	Degrees of freedom	p-value
		Dropout [n(%)]	Completed [n(%)]			
Distance from the health facility	<1km 2-3km >3km	27(14.3) 80(42.3) 82(43.4)	0 37(37.4) 62(62.6)	19.345	*2*	*0.000**
Attitude of health workers	Friendly Not friendly	114(60.3) 75(39.7)	72(72.7) 27(27.3)	4.374	1	*0.036**
Health education on immunization	Yes No	129(68.3) 60(31.7)	71(71.7) 28(28.3)	0.367	1	*0.545*
Availability of vaccines	Available Not available	132(69.8) 57(30.2)	32(32.3) 67(67.7)	37.300	1	*0.000**
Availability of health workers	Available Not available	95(50.3) 94(49.7)	46(46.5) 53(53.5)	0.375	1	*0.540*
Time spent before seeing health workers	<1 hour 2hours 2-5 hours More than 5 hours	19(10.1) 86(45.5) 53(28.0) 31(16.4)	19(19.2) 29(29.3) 39(39.4) 12(12.1)	11.806	3	*0.008**

Bivariate analysis revealed that distance from the health facility*(X^2= 19.345, df=2, p=0.000)*, attitude of the health workers *(X^2= 4.374, df=1, p=0.036)*, availability of vaccines *(X^2= 37.300, df=1, p=0.000)*, and waiting time spend before receiving immunization services*(X^2= 0.375, df=1, p=0.000)* were associated with immunization dropout. However, health education on immunization (p=0.545) and availability of health workers (p=0.540) were not associated with immunization dropout as shown in the table above.

CHAPTER FIVE: DISCUSSION OF FINDINGS

5.1 Introduction

The objective of this study was to determine the factors that are associated to immunization drop- out among children of two months to five year of age, in Kwanza division, Trans-Nzoia district, Kenya during June to July 2016. This chapter presents discussion of the findings in comparison to findings from previous related studies.

5.2 Socio-demographic characteristics of the respondents.

Majority of the respondents were aged between 21 to 35 years (52.4%). This could be attributed to the fact that majority of the reproductive population in Kenya and Africa at large is within this age bracket (KBOS, 2009, WHO, 2015). Most respondents were female (78.5%), probably due to the fact that most care takes who bring babies for immunization are mothers as compared to men. This could also be attributed to the low involvement of men in immunization and other related aspects of their families in Kenya (KBOS, 2009). In addition most respondents were married/cohabiting, this could have due to the fact that most of the reproductive cluster is married people (United Nations, 2012). While most respondents' at least achieved secondary level of education (48.6%) this in line with findings of the 2009 Kenya housing and population census that reported that most Kenyans have at least secondary level of education (KBOS, 2009). The mother's education level has significant role in immunization coverage, improvement in female education status would lead to a reduction in immunization dropout rate, mother's with a higher level of education status are more likely to complete the immunization schedule as compared to their ones of low or no formal education (Kumar et al., 2008).

Socio-demographic factors related to immunization in this study, are similar to findings from previous studies which showed that various demographic factors are associated with immunization utilization (Haji et al., 2016; Sanou et al., 2009; Ughade et al., 2000; Ayoola et al., 2011; Kumar et al., 2008). However these findings differ from some study findings that reported place of residence and mother's socio demographic variables were not influencing immunization dropout among children (Etana et al., 2012). Other studies have further noted that immunization in urbanized villages of Delhi and literate mothers were 1.4 times more likely to take their children up to full immunization as compare to illiterate mothers however

education status of the father was not significantly associated with immunization completion (Chhabra et al., 2007).

In this study, more than three thirds of the respondents were employed (77.8%). Employment concurrent with other health duties has been associated with neglect of immunization of children (Adamu & Salihu, 2010). The need to fulfill duties at work leads to failure of parent/ care takers to take their children for complete immunization. With regards to monthly income, most respondents (41.7%) reported that they received between 3500Kshs to 6,000Kshs per month income. This represents a good socioeconomic status that can support for complete immunization of children. Low monthly income has been associated with immunization dropout (Etana et al., 2012).

5.3 Immunization dropout among the respondents (n=288)

The proportion of immunization dropout in this study was 65.6% (n=189) while more than a third of the respondents reported that they completed immunization according to the Kenya immunization schedule (34.4%). This reflects a high dropout rate compared to national immunization coverage of 84% (WHO, 2014). This is in line with findings from a study that evaluated immunization coverage in Kenya, which reported that despite of the national coverage, many districts in Kenya continue to report low vaccination coverage (Haji et al., 2016).

The high dropout rate could be attributed to the large number of children born in these countries or low vaccine coverage (WHO, 2008). Immunization dropout enlarges the gap between loss of protection from maternal antibodies and full protection from vaccine induced immunity, it negatively affects herd immunity and postpones full protection in infant and children. As a consequence, infants are longer vulnerable to vaccine preventable diseases, such as Bordetella, pertussis and measles contributing to outbreaks of the latter in country.
The immunization dropout rate reported in this study is higher that reported in other countries in East Africa, this in line with reports which noted that Kenya has the lowest immunization coverage in East Africa. With 86 per cent national immunization coverage, Kenya has the lowest number of fully immunized children in East Africa compared to Tanzania which has 92 per cent (according to daily monitor November 18, 2015) against the 90 per cent target of the global immunization vision and strategy (Otage et al., 2013)

Bivariate association of immunization dropout and socio-demographic characteristics of the respondents reveals that Age of the respondent (p= 0.000), Marital status (p= 0.002), level of education (p= 0.000), employment status (p= 0.000), and monthly income (p= 0.000), were significantly associated with immunization dropout among the respondents. Higher income status could enable the care takers to afford transport to the immunization centres as well as hospital bills. This in line with a study that reported children living in a household that had a monthly household income of more than fifty US dollars were more likely to complete immunization regarding findings of a cross section study that sought to assess determinants of third dose DPT completion among children F from EPI centers in Pakistan (Usman et al., 2010).

Completion of at least post-secondary education and maternal unemployment are linked to immunization completion (Ayoola et al., 2011; Nath et al., 2007

5.4 Individual related factors associated with immunization dropout.

Univariate individual related factors associated with immunization dropout, showed that most respondents reported that immunization is important, parental knowledge of the preventative value enhances the completion of immunization.

Respondents reported that the protective values of immunization included protection against diseases (64.6%), followed by proper child growth (24.7%), while 1.4% were not sure what the importance of immunization was and 9.4 % reported other importances of immunization. This is a positive attitude and could encourage care takers to take their children for immunization in attempt to utilization these benefits of immunization against not immunising their children. Studies have noted that maternal perception regarding importance of vaccines was significantly associated with higher immunization rates in Ethiopia, India and Kenya (Owais et al., 2009; Phukan et al., 2009; Tadesse et al., 2009; Owino et al., 2009).

Regarding awareness of complete immunization schedule, most respondents were not aware of the complete schedule (71.9%), while only less than a third (28.1%) of were aware of the complete schedule. Lack of aware of the complete schedule of immunization could led to dropout since the care taker may assume that he has already finished all the vaccines yet it’s

not the case. Bivariate analysis revealed that immunization dropout was significantly associated with individual perceived importance of immunization (p-value=0.045),

According to the Expanded Programme on Immunization (EPI) of Kenya, for immunization to be considered complete, a child has to receive all the vaccine as per immunization schedule shown in table 1. A child should have received all the vaccinations by the age of 5 years if protection against vaccine preventable diseases is to be highly achieved but more children continue to miss on this and therefore affecting their health.

Lack of knowledge on the immunization has been linked to immunization dropout in various studies for instance in Ambo Woreda, Central Ethiopia. Etana et al (2012), mother's knowledge on age at which vaccination begins and knowledge on the age at which immunization is complete (Etana et al., 2012). Bivariate analysis revealed that immunization dropout was significantly associated awareness of the complete immunization schedule (p=0.000) in this study. Improvement in educational interventions aimed at immunization completion improves routine immunization completion (Owais et al., 2011). Nath et al (2007) noted that lack of information regarding vaccine administration and on subsequent immunization schedules (Nath et al., 2007). Mother's knowledge of immunization target diseases, measles immunization schedule and literacy were found to be predicting factors mothers of 12-59 months old children in LAO PDR after regional polio eradication in Western Pacific (Maekawa et al., 2007).

Majority of the respondents reported that they knew of the side effects of immunization (62.2%) while 37.8% reported that they did not know of any side effect of immunization. This could be attribute to some mild effects experienced after vaccines are administered to the child.

With regards to perceived safety of vaccines, most respondents reported that vaccines are safe (44.8%) followed by those who were not sure whether vaccines are safe while almost a third of them reported that they are not safe (27.4%).

In this study the side effects that were reported by the respondents included disability was the commonest side effect followed by fever after immunization of the child and diseases. 9.7% of the respondents reported that they were not sure about side effects of vaccines and 5.6% reported other side effects associated with vaccines.

Bivariate analysis revealed that immunization dropout was significantly associated knowing of the side effects of vaccines (p=0.000), and perceived safety of the vaccines (p=0.000). This could led to misconceptions about the effects of the vaccines hence dropout therefore a clear health education on the side effects that can be experienced after immunization could reduce dropout due to misconceptions about vaccine side effects.

5.5 Health system related factors

Most respondents stay more than 3 kilometres from the immunization centres, followed by those who reside 2-3 km from the health facility. Distance from the health facility could hinder completion of immunization due to economic constraints associate with transport to the facility. Bivariate analysis revealed that distance from the health facility *(p=0.000).* Similar findings showed that completion is higher among children who live near rural EPI centers in Pakistan as compare to those who reside more a 10 minutes away distance from the EPI centre (Usman et al., 2010).

Most respondents reported that health providers are friendly while a third of the respondents reported that health service providers are friendly at the health facilities. This can encourage the care takers to fully interact with the care providers hence reducing on dropout. Bivariate analysis revealed that attitude of the health workers *(p=0.036)* was associated with immunization dropout. *Attitude of Health workers has been associated with immunization dropout due to fact that care givers feel that the health workers are not willing to provide the services they need (Usman et al.,2010).*

With respect to provision of health education on immunization, majority of the respondents reported that they receive health education on immunization at the health facilities while a third of them reported that they don't receive health education on immunization at the health facilities. Providing vaccine related targeted health education to mothers at home and during ANC visits is an effective strategy to improve immunization completion rates in low literacy and income settings (Owais et al., 2011, Dietz et al., 1997). Usman et al (2009) reported that there was an increase in immunization completion among infants of mothers who received primary healthcare center-based education on their first immunization visit. Improvement in educational interventions aimed at immunization completion improves routine immunization completion for mothers in low income setting of Karachi (Owais et al., 2011). Complete

immunization is associated provision of written information on Hepatitis disease and immunization (Isabelle et al., 2009).

Regarding availability of vaccines and health workers at the health facilities, most respondents reported that vaccines are available (56.9%), while more than a third (43.1%) reported that vaccines are not always available at the health facilities. More than a half of the respondents reported that health worker are not always available at the health facilities while 49% reported that they are available. Bivariate analysis revealed that availability of vaccines *(p=0.000)* was significantly associated with immunization dropout.

Majority of the respondents reported that they spend 2 hours (39.9) while waiting for immunization services followed by 2-5 hours (31.9%). 14.9% (n=43) of the them reported that they spend more than 5 hours while only less than a third 13.2% (n=38) reported that they spend less than 1hour while waiting for immunization at the health facility. Schedules for immunization are during working hours in most health facilities therefore, spending more time at the health facility could hinder the working status of the care taker hence they may decide not to take their children for immunization in attempt to safeguard their jobs since most of them were employed.

Bivariate analysis revealed that waiting time spend before receiving immunization services *(p=0.000)* was associated with immunization dropout. This could be attributed to spending too much in ques as they wait for immunization services.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This study identified factors that are associated with immunization drop- out among children of two months to five years of age in Kwanza, Trans-Nzoia district, Kenya. These include socio-demographic factors, individual or parental related factors and health system related factors. This calls for advanced improved strategies in this district and other districts with similar environmental and social contexts.

6.2 Recommendations

To the health care workers

Improvement in educational interventions aimed at immunization completion, this will improve routine immunization completion. Clear health education on the side effects that can be experienced after immunization could reduce dropout due to misconceptions about vaccine side effects.

Providing vaccine related targeted health education to mothers at home and during ANC visits is an effective strategy to improve immunization completion rates in low literacy and income settings.

To policy makers

Immunization sites should be set up in remote areas; this is intended to provide a greater opportunity for children to access immunization services by reducing the distance to these services. Bringing more children to EPI Centers should deal with relocation of centers to appropriate locations by decreasing travel time hence less dropouts.

This should be coupled with comprehensive communication and health education regarding immunization issues. While comprehensive communication may improve understanding about the immunization schedules.

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APPENDIX I: CONSENT FORM

Introduction:

Researcher: KAPURU BRAMUEL WANJALA, REG. NO. 2012-BNS-FT-017.

Student of International Health Sciences University, School of Nursing. Bachelor of Science Degree in Nursing.

Study: Academic study on Factors associated with immunization drop- out among children of two months to five years of age in Kwanza, Trans-Nzoia district, Kenya

Academic Supervisor: Mrs Wanyenze Eva, a lecturer at the School of Nursing of International Health Sciences University.

Research objective: The aim of the study is to determine the factors that are associated to immunization drop- out among children of two months to five year of age, in Kwanza division, Trans-Nzoia district, Kenya during March to April 2016.You are therefore kindly requested to participate in this study. It is voluntary to either participate or not to participate in the study therefore despite of your decision, no effects on you. You are freely allowed to withdraw from the study at any time. Inquiries: please contact the researcher on +254727866220/256775299237/b.wanjara@ihsu.ac.ug

Informed Consent Statement: The study information described in this form has been clearly read, explained to me and understood. I therefore agree to voluntarily participate in this study

Participants name	Signature/thumb print	Date
……..	……	……
Name of researcher	Signature/thumb print	Date
……..……	……	……

APPENDIX II: QUESTIONNAIRE.

A STUDY ON FACTORS ASSOCIATED WITH IMMUNIZATION DROP- OUT AMONG CHILDREN OF TWO MONTHS TO FIVE YEARS OF AGE IN KWANZA, TRANS-NZOIA DISTRICT, KENYA

Number**.....Date.....**

PART A: SOCIO-DEMOGRAPHIC DATA

(Please tick in the appropriate box)

1. Age (in complete years)

1) <20 [ ]
2) 21-35 [ ]
3) Above 35 [ ]

2. Gender

Male [ ] Female [ ]

3. Marital status

1) Married| cohabiting [ ]
2) Single [ ]

4. Level of Education

1. None [ ]
2. Primary [ ]
3. Secondary [ ]
4. Tertiary [ ]

5. Employment status.

1. Employed [ ]
2. Unemployed [ ]

6. Income level per month

1. <3500kshs [ ]
2. 3500 to 6000ksh [ ]
3. 6000to 15000ksh [ ]
4. >15000[ ]

Section 2 Individual factors

(Please tick in the appropriate box)

1. Do you take your child for all immunization up to five years of age?

a) Yes [ ]
b) No [ ]

2. In your opinion, is immunization important to your child?

a) Yes [ ]
b) No [ ]

3. If yes to the above question, what could be the importance of immunization to your child?

a) Protection against diseases [ ]

b) Proper growth [ ]

c) Not sure [ ]

d) Others (specify)…….

4. Do you know about the complete immunization schedule for your child?

a) Yes [ ] b) No [ ]

5. Are there side affects you know on immunization of children?

a) Yes [ ] b) No [ ]

6. Which side effects have you ever experienced due to immunization of children?

a) Children get diseases after immunization [ ]

b) Fever [ ]

c) Becoming disabled [ ]

d) Not sure [ ]

e) Others (specify)…….

7. Do you think vaccines are safe to be used on your child?

a) Not sure [ ] c) Not safe [ ]

b) They are safe [ ]

Section 3 health care system related factors.

1. How far do you stay from the immunization centre?

a) Less than 1 km [ ] c) More than 3 km [ ]

b) 2-3 km [ ]

2. Are health workers at the immunization centre friendly to you?

a) Friendly [ ] b) Not friendly [ ]

3. Do you receive health education regarding immunization from your immunization centers?

a) Yes [ ] b) No [ ]

4. Are vaccines readily available at your immunization centre?

a) Available [ ] b) Not always available [ ]

5. Do you find health workers who are responsible for immunization at you centre?

a) Available [ ] b) Not always available [ ]

6. How long do you spend at the health facility before your child is immunized?

a) Less than 1 hour [ ]

b) 2 hours [ ]

c) 5 hours [ ]

d) More than five hours [ ]

Thank you for your response

APPENDIX III: INTRODUCTORY AND CORRESPONDENCE

IHSU INTERNATIONAL HEALTH SCIENCES UNIVERSITY
sanitas per scientiam

making a difference in health care

Office of the Dean, School of Nursing

Kampala, 22nd June 2016

ASSISTANT COUNTY COMMISSIONER
KWANZA WARD
23 JUL 2016
P.O. Box 4-30201, ENDEBESS

TO WHOM IT MAY CONCERN
Recind Bramuel during his Study
23/7/2016

Dear Sir/Madam,

RE: ASSISTANCE FOR RESEARCH

Greetings from International Health Sciences University.

This is to introduce to you **Wanjala Bramuel Kapuru** Reg. No. **2012-BNS-FT-017** who is a student of our University. As part of the requirements for the award of a Bachelors degree in Nursing of our University, the student is required to carry out research in partial fulfillment of his award.

His topic of research is: **Factors associated with immunization drop-out among children of two months to five years of age in Kwanza Trans-Nzoia District - Kenya**

This therefore is to kindly request you to render the student assistance as may be necessary for his research.

I, and indeed the entire University are grateful in advance for all assistance that will be accorded to our student.

Sincerely Yours,

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22 JUN 2016
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