

**FACTORS INFLUENCING COMPLETION OF THE IMMUNIZATION SCHEDULE
OF CHILDREN BELOW 2 YEARS IN MADU COMMUNITY
GOMBA DISTRICT**

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**AN UNDERGRADUATE RESEARCH REPORT SUBMITTED TO THE SCHOOL
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DECLARATION

I, **Nakabuye Stella**, declare that this research report titled, “**Factors influencing completion of the immunization schedule of children below 2 years in Madu Community, Gomba District**”, is original and entirely mine and has never been presented in any other institution for the award of a Degree.

Signature:

Date:

APPROVAL

I hereby accept submission of this Research report for the above research study on the “**Factors influencing completion of the immunization schedule of children below 2 years in Madu Community Gomba District**”, which I have supervised and approved for submission to International Health Sciences University.

Signature..... Date

MRS. WAFULA ELIZABETH

SUPERVISOR

DEDICATION

I dedicate this research to my husband and daughter who have tirelessly worked hard to see me finish this course with success.

ACKNOWLEDGEMENT

My deepest gratitude goes to the almighty God who has provided all that was needed to complete this project and the program for which it was undertaken for.

I give special thanks to my whole family which has been my constant source of inspiration. A special feeling of gratitude to my loving husband, whose words of encouragement and persistence to boost my efforts towards finishing.

I appreciate my supervisor, Mrs. Wafula Elizabeth whose contribution and constructive criticism has pushed me to expand the kind of effort I have exerted to make this work as original as it can be.

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OPERATIONAL DEFINITIONS

Immunization

Is the process through which an individual is made resistant to an infectious disease, typically by the administration of a vaccine. (WHO, 2016)

Vaccine

Is a product that stimulates a person's immune system to produce immunity to a specific disease, protecting the person from that disease. (CDC, 2014)

LIST OF ABBREVIATIONS

DPT	:	Diphtheria, Tetanus and Pertussis
EPI	:	Expanded Program on Immunization
GAVI	:	Global Alliance for Vaccines and Immunization
MDGs	:	Millennium Development Goals
MFPEd	:	Ministry of Finance Planning and Economic Development
MoH	:	Ministry of Health
OPV	:	Oral Polio Vaccine
PCV	:	Pneumococcal Vaccine
U5M	:	Under five Mortality
UBOS	:	Uganda Bureau of Statistics
UDHS	:	Uganda Demographic Health Survey
UNICEF	:	United Nations Children's Fund
WHO	:	World Health Organization
HCWs	:	Health Care Workers
CDC	:	Centre for disease control

ABSTRACT

Background: Low levels of immunization as a result of failure to complete the immunization schedule, results into a high risk of death from vaccine preventable diseases. The aim of this study was to assess the extent of immunization completion and factors influencing completion of the immunization schedule of children below 2 years in Madu community Gomba district from March to May 2018.

Methods: A cross sectional study was carried out in three villages of Kyamabaale, Kyamuyiisa and Kayunga in Madu community, Madu Sub County in Gomba District among parents or guardians/ caretakers of children less than 2 years of age. Simple random sampling was used to select the 380 participants. Data analysis was performed using SPSS and a 0.05 significance level was considered.

Results: 380 invited participants fully completed the survey. There was a significantly low level of immunization completion of 44.5% in the study setting. Correlates to immunization completion are multifactorial, at bivariate analysis, immunization completion was correlated with Socio-demographic factors including; age of the care taker, marital status, age of the child, sex of the child, place of delivery of current child, and nuber of children were statistically associated with completion of immunisation; knowledge of: what immunisation is , right age of completing and starting immunisation, issing one or more of the scheduled immunisation schedules was also significantly correlated to immunisation completion, individual attitude towards immunization, completion of immunization was significantly correlated with experience of side effects following immunization; Health related characteristics such as receiving health education talks during visits to health facility. The independent predictors of immunization completion after multivariate analysis included: individual awareness of the time of starting and ending immunization.

Conclusion: despite routine efforts to increase immunization coverage such as family health days, immunization completion remains low in Gomba, Uganda. Correlates to immunization completion are multifactorial; interventions aiming at increasing immunization completion in Gomba district, Uganda are needed. These should consider creating awareness and community participation in immunization campaigns.

CHAPTER ONE: INTRODUCTION

1.0 Introduction

This chapter presents the background, problem of statement, objective of the study, research questions, Justification of the study and conceptual framework which is a presentation of the relationship between the variables.

1.1 Background

Low levels of immunization as a result of failure to complete the immunization schedule, results into a high risk of death from vaccine preventable diseases. Immunization is one of the most cost-effective and widely implemented public health interventions to prevent under-five child mortality (Jani et al., 2008; Negussie et al., 2016).

WHO initiated and launched Expanded Programme on Immunization (EPI) in 1974 which was afterwards adopted by all countries in the 1980s to ensure maximum protection of children (Landoh et al., 2016) . EPI aims at delivering the primary immunization series to at least 90 % of infants although this objective is still not met by many low resource countries (Negussie et al., 2016).

According to the guidelines developed by the World Health Organization, children are considered to have received all basic vaccinations when they have received BCG vaccine against tuberculosis, three doses each of the DPT-HepB-Hib/ pentavalent and polio vaccines, and a vaccination against measles (Uganda Bureau of Statistics, 2016). The Bacille Calmette Guerin (BCG) vaccine is usually given at birth or at first clinical contact (Uganda Bureau of Statistics, 2016) or from birth to 8 weeks as reported by Babirye et al.,(2012). Oral Polio vaccine (OPV) is given at birth then after three doses at a period of 6, 10 and 14 (Babirye et al., 2012; Rahji and Ndikom, 2013; Ophori et al., 2014; Kiptoo, 2015). In addition to OPV, Uganda introduced Injectable Polio Vaccine (IPV) in 2016. The combination of IPV and OPV provides stronger protection in children against polio. IPV strengthens immunity in the blood while OPV strengthens immunity in the gut. IPV is given at 14 weeks or contact after that age (Ministry of health, 2018). The DPT-HepB-Hib is given at a period 6, 10, and 14 weeks (Oryema et al., 2017)

Measles vaccine is given at or soon after age 9 months. Infants travelling to countries experiencing extensive measles transmission are given a dose of vaccine as early as 6 months of age (WHO, 2011) . A child aged 12-23 months is considered to be fully

immunized in Uganda if the child has received all basic vaccinations, plus and three doses of the PCV vaccine (Uganda Bureau of Statistics, 2016).

Immunization coverage has stalled at 86% worldwide with no significant changes during the past years. Immunization currently prevents approximately 2 to 3 million deaths every year although an additional 1.5 million deaths could be avoided incase vaccination coverage improves worldwide. It is estimated that 19.5 million infants worldwide are still missing out on basic vaccines (WHO, 2018) .

Estimated global coverage with BCG, polio 3, and Measles vaccine was 91%, 86%, and 85%, respectively (CDC, 2015). Approximately 21.8 million eligible children did not receive 3 doses of DPT-3 in 2013 of which 9.6 million had started but did not complete DPT-3 dose series worldwide (WHO, UNICEF and CDC, 2013).

In Africa, the biggest number of children remain unvaccinated and under-vaccinated despite the fact that there has been remarkable progress in provision and supporting immunization services (Negussie et al., 2016). Full childhood immunization coverage varies widely from only 11% of children of ages 12 to 23 Months in Chad to 78% in Zambia in Sub-Saharan Africa (Kamanda, 2010).

In Democratic Republic of Congo among the Lao people, there was improved immunization coverage in that measles vaccine coverage was 87%, diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage was 88%, tuberculosis (BCG) immunization coverage was 82%, and polio (OPV3) immunization coverage was 88% in 2014 (Xeuvatvongsa et al., 2017). Russo et al., (2015) in a study that was carried out in Cameroon reported that vaccination coverage was high although 1 out of 7 children were partially vaccinated, and 1 out of 4 did not complete timely the recommended vaccinations

The Uganda Demographic Health Survey report showed that, 96% of children received the BCG vaccination, 95 % the first dose of DPT-HepB-Hib, 95% the first dose of polio, and 87 % the first dose of the pneumococcal vaccine. 80% of children received a measles vaccination. Unfortunately, there was a decline in the immunization coverage for subsequent doses, with 79 % of children receiving the recommended three doses of DPT-HepB-Hib, 66 % the three doses of polio, and 64 % the three doses of the pneumococcal vaccine (Uganda Bureau of Statistics, 2016).

In Hoima, one of the rural Ugandan districts, coverage for DPT3 among children aged 12–23 months is administratively estimated at 72% for DPT3 and measles at 76%. These are all below the district and the national targets of 85% for DPT3 and 90% for measles and may partly explain the frequent outbreaks of vaccine preventable diseases (Ministry of Health, Uganda 2014; Oryema et al., 2017).

Babirye et al., (2012) in a study on timeliness of Childhood Vaccinations in Kampala Uganda reported that timely vaccinations ranged from 67.5% for measles vaccine to 92.7% for BCG vaccine. Overall, less than half (45.6%) of all children received all vaccines within the recommended time ranges. A cross-sectional descriptive study by Odiit and Amuge, (2003) on comparison of vaccination status of children born in health units and those born at home of 486 children under five years in Jinja town, Eastern Uganda, it was found that 68% of the children were up to-date with their vaccines.

According to the Ministry of health Uganda,(2012) routine immunization coverage for July to December 2012, Gomba district was reported to have good access to immunization services yet poor utilization was registered. The dropout rate from when a child receives DPT-1 up to DPT-3 was 14% while the dropout rate from when a child receives DPT-1 up to measles was 20%. No other literature regarding completion of the immunization schedule exists in Gomba district and hence, this study aims at investigating the factors influencing completion of the immunization schedule of children below 2 years in Madu community Gomba district.

1.2 Statement of the problem

Vaccine Preventable Diseases (VPDs) account for about a quarter of the 8 million deaths occurring annually among children under five years of age especially in low-income countries such as Uganda (Babirye et al., 2012).

Various strategies including mass immunization programs against various vaccine preventable diseases and education programs on these diseases have been employed by the Ministry of Health of Uganda to improve the immunization coverage and ensure completion of the immunization schedule.

Despite all these strategies, there seems not to be any significant improvement in the completion of the immunization schedule of children below 2 years in Gomba district showed by the available DPT vaccine and measles vaccine dropout rate of 16% and 20% as earlier noted. (Ministry of health Uganda, 2012)

Failure to complete the immunization schedule as per the UNEPI recommendation predisposes children to vaccine preventable conditions, increases hospital stay due to illnesses which increases the morbidity, and mortality of children. Therefore, this study will focus on assessing the factors influencing completion of the immunization schedule of children below 2 years in Madu community Gomba district.

1.3 Objectives of the Study

1.3.1 General Objective

To assess factors influencing completion of the immunization schedule of children below 2 years in Madu community Gomba district from March to May 2018.

1.3.2 Specific Objectives

- i) To determine the level of completion of the immunization schedule of children below 2 years among mothers of Madu Community in Gomba district from March to May 2018.
- ii) To examine child related factors influencing completion of the immunization schedule of children aged below 2 years in Madu community Gomba district from March to May 2018.
- iii) To assess caregiver related factors influencing completion of the immunization schedule of children below 2 years in Madu community Gomba district from March to May 2018.
- iv) To explore health facility related factors influencing completion of the immunization schedule of children below 2 years in Madu community Gomba district from March to May 2018.

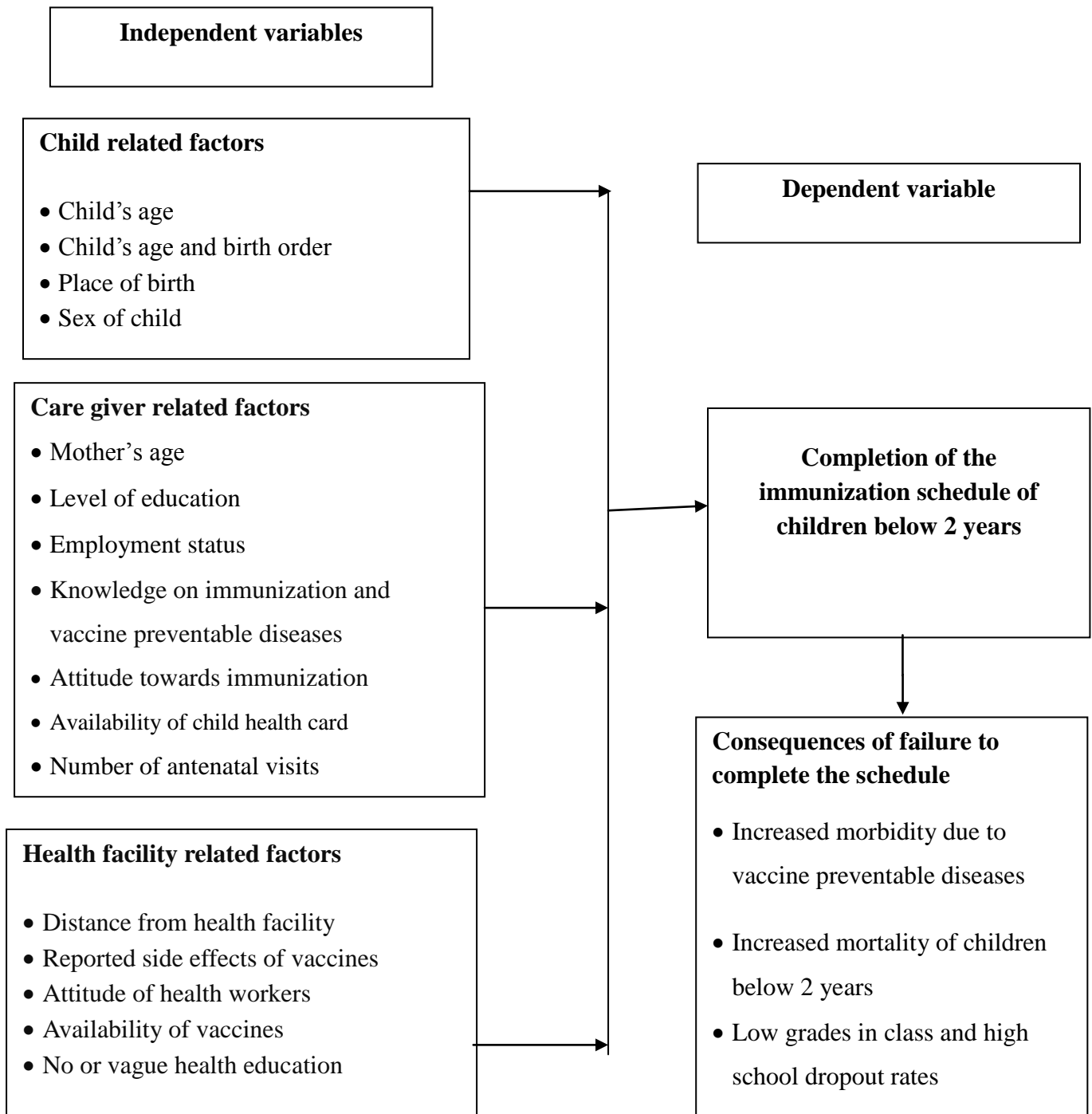
1.4 Research questions

- i) What is the level of completion of the immunization schedule of children below 2 years among mothers of Madu Community in Gomba district from March to May 2018?
- ii) What are the child related factors influencing completion of the immunization schedule of children aged below 2 years in Madu community Gomba district from March to May 2018?
- iii) What are the caregiver related factors influencing completion of the immunization schedule of children below 2 years in Madu community Gomba district from March to May 2018?
- iv) What are the health facility related factors influencing completion of the immunization schedule of children below 2 years in Madu community Gomba district from March to May 2018?

1.5 Significance of the Study

- i. Completion of the immunization schedule is important to protect not only the health of a child but also to protect the community.
- ii. Ensuring high immunization may be beneficial to people of Madu community in that their expenditure on health will be reduced as the number of children suffering from immunizable diseases will be few.
- iii. There may be increase in productivity towards Uganda as the community will have time to engage themselves in more productive activities since less time is spent attending to their sick children
- iv. It may also be helpful to future researchers from International Health Sciences University and other institutions as a source of information while they are conducting their research.
- v. It may also enable me to fulfill one of the requirements for attainment of an award of a Bachelors' degree from International Health Sciences University.

1.6 Conceptual framework of the study



1.6.1 Description of the conceptual framework

The figure above illustrates various factors that may influence completion of the immunization schedule of children below 2 years in Madu community Gomba district.

The independent variables include (i) **Socio-demographic characteristics of mother and child;** including; mother's age, level of education, marital status, employment status, child's age, child's birth order, place of birth and sex of child, (ii) **Care giver related factors like;** Knowledge on immunization and vaccine preventable diseases and attitude on immunization and (iii) **Health facility related factors which entails;** distance from health facility, reported side effects of vaccines, attitude of health workers, availability of vaccines and no or vague health education.

The dependent variable is completion of the immunization schedule which is influenced by the above mentioned factors.

The model also shows the consequences that may arise due to failure to complete the immunization schedule which include; increased morbidity due to vaccine preventable diseases, increased mortality of children below 2 years and low grades in class and high school dropout rates

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter presents the review of literature from previous studies in regards to the research objectives of this study, including factors that may influence completion of the immunization schedule of children below 2 years. This review will look at research that has been carried out in regards to the socio-demographic factors (gender, age, religion, level of education, employment status, religion and marital status), caregiver related factors (knowledge and attitude of caregivers) and health facility related factors (distance from health facility, reported side effects of vaccines, unskilled health workers, attitude of health workers, availability of vaccines).

2.1 Level of completion of the immunization schedule

Worldwide, immunization of children is ranked among the most successful public interventions in health care that has minimized over 3 million and around 800,000 disabilities annually (WHO, 2016). It is estimated that between 24.6 and 25.8 million deaths will be prevented (Abiyot Getachew Asfaw et al., 2016).

In 2014, estimated DTP-3 coverage was 86% worldwide among infants aged less than 12 months, ranging from 77% in the WHO African Region to 96% in the Western Pacific Region, and representing 115.2 million vaccinated children. Approximately 18.7 million eligible children did not complete the 3-dose series; among whom 61% did not receive the 1st DTP dose, and 39% started, but did not complete the 3-dose series. Estimated global coverage with BCG, polio 3, and Measles Containing Vaccine 1 was 91%, 86%, and 85%, respectively (CDC, 2015).

Africa and Southeast Asia are regions most affected by the problem of vaccine preventable disease of which more than 70% of these children live in 10 developing countries and South Africa including Ethiopia (Abiyot Getachew Asfaw et al., 2016).

In Nigeria, 27% of child mortality amounting to over 200,000 deaths per year have been attributed to VPDs. It is of interest to note that the Under 5 Mortality rate is 124 per 1000 and ranking 9th according to recent UNICEF estimates (Tagbo et al., 2014).

The overall prevalence of fully immunized children in Ethiopia was 24.3 %. Specific vaccination coverage for DPT-3, Polio-3, Measles and BCG were 36.5 %, 44.3 %, 55.7 % and 66.3 %, respectively. About 29 % of mothers who had vaccination cards had fully immunized their children of age 12–23 months (Lakew, Bekele and Biadgilign, 2015a).

Maina, Karanja and Kombich, (2013) reported that in East Africa, 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.

Chambongo et al., (2016) in a cross-sectional study in Ileje district Tanzania found out that a high proportion of children (71.1%) had completed their vaccination schedule. The study also reported that utilization was highest for BCG vaccine 99.2%, followed by DPT-HB-Hib 91.8% and least for OPV 73.4%. Nearly 18 children (2.1%) had never been vaccinated with OPV and pentavalent vaccines while 6.1% had never been vaccinated with measles vaccine. On average, 54% of children in Uganda were fully immunized, 89% received a full dose of BCG, 24% received DPT, 52% received polio, and 64% received the measles vaccine. The percentage of immunized children increased with maternal education; 63% of children whose mothers had post-secondary education were immunized compared to 53% of children having mothers with no education (Bbaale, 2013).

Ministry of health Uganda,(2012) routine immunization coverage for July to December 2012, Gomba district was reported to have good access to immunization services yet poor utilization was registered. The dropout rate from when a child receives DPT-1 up to DPT-3 was 14% while the dropout rate from when a child receives DPT-1 up to measles 20%.

2.2 Child related factors influencing completion of the immunization schedule of children aged below 2 years

2.2.1 Child's age and birth order

A Cross-sectional descriptive study on comparison of vaccination status of children born in health units and those born at home found out that the highest percentage of children up to date with their vaccination (72%) occurred among the birth ranks 1-3. An increasing birth rank appears to be matched by a declining percentage of children who are up to date with vaccination. This may be a reflection of reducing family resources available to an individual child the more children a family has. On the other hand, family spacing may re-inforce child vaccination in that the parents would have the time, energy and resources to take the child for vaccination (Odiit and Amuge, 2003).

A child's age was also significantly associated with completion of the immunization schedule. Huang et al., (2015) in a study carried out in China revealed that, expansion programme for immunization of children was more among children over 3 years as compared

to children who were younger than three years. Similar results were also reported by Liang et al., (2009) who found out that, children over 3 years had a higher immunization completion because by this age, children start attending formal schools where their immunization certificates are required for registration. This thus encourages the parents to ensure that their children have completed vaccination to avoid resentment from the school administrators.

A cross section study on community vaccine perceptions and its role on vaccination uptake among children aged 12-23 months among 380 mothers in the Ileje District, Tanzania found out that being young (less than 17 months) reduced the likelihood of being completely vaccinated (Chambongo et al., 2016)

Russo et al., (2015) in a cross-sectional survey on vaccine coverage and determinants of incomplete vaccination in children aged 12-23 months in Dschang, West Region, Cameroon reported that children who were the first to second born in the family compared with those being the third or later born.

A case control study on factors associated with incomplete childhood immunization in Arbogona district, southern Ethiopia among 548 respondents reported that child birth order was found to be associated with immunization incompleteness whereby being second to fourth in the family and being fifth and above in the family had a higher likelihood to default than being born first (Negussie et al., 2016).

A study on factors associated with full immunization coverage amongst 978 children aged 12 –23 months in Zimbabwe found out that 69% of children of the first birth order were fully immunized as compared to 59% of children of birth order 5-6 and 45% of children of the 6th birth order and above (Mukungwa, 2015).

2.2.2 Place of birth

In a community-based cross-sectional study on timeliness of childhood vaccinations in Kampala Uganda, Babirye et al., (2012) reported that untimely vaccination was more likely if the child was born outside a hospital. Most mothers who delivered from hospitals-initiated vaccination in time and, in general, vaccination schedule adherence tends to decrease subsequently with later vaccines

A study on Comparison of vaccination status of children born in health units and those born at home reported that a child born at a health unit was significantly more likely to have had BCG scar than a child born at home (Odiit and Amuge, 2003)

Negussie et al., (2016) in a case control study that investigated factors associated with incomplete childhood immunization in Arbogona district, southern Ethiopia found out that only 9 (6%) mothers of the cases and 26 (9 %) of the controls gave birth at health institutions, and all mothers of both groups were advised to vaccinate their child after delivery.

In a study that surveyed the causes of delays in immunization of children in Sub Saharan Africa, Odusanya et al., (2008) found out that most mothers lacked knowledge on the benefits of full immunization of their children because they never got the opportunity to be health educated. A cross section study on community vaccine perceptions and its role on vaccination uptake among children aged 12-23 months in the Ileje District, Tanzania reported that a child being born in the health facility strongly increased the odds of being completely vaccinated (Chambongo et al.,2016).

A cross-sectional study on immunization coverage and its determinants among children aged 12 - 23 months in a peri-urban area of Kenya that was carried out by Maina, Karanja and Kombich, (2013) revealed that 60.5% of deliveries were conducted at a health facility while 30% were home/TBA assisted deliveries. This meant that 2.26 times of the children were more likely to receive full immunization compared to one delivered at home (by self) or by a Traditional Birth Attendant.

2.2.3 Sex of child

Studies have shown that sex of the child found to predict the immunization status of the child in the societies in which gender inequality is prevalent. A review done in India from 1996-2006 showed girls were found to have significantly lower immunization coverage than boys for BCG, DPT, and measles (Daniel, J.et al. 2009).

In Bangladesh, females were 0.84 times less likely to be fully vaccinated than male children (WHO, 1998). But another study done Nigeria in 2003 showed no any significant sex difference (Diddy A. 2009). In 2006 Ethiopian EPI survey also showed that no statistically significant difference between girls and boys with regard to their immunization status (Kidane T, Yigzaw A, Sahilemariam Y, Bulto T, Mengistu H, Belay T, et al. 2006).

A cross sectional study on vaccination coverage and immunization timeliness among children aged 12-23 months in Senegal found out that female children were more likely to have correctly timed vaccinations with MCV, Penta 3 and Polio 3 (Salam et al., 2017).

2.3 Care giver related factors influencing completion of the immunization schedule of children below 2 years

2.3.1 Mother's age

A study on factors influencing full immunization coverage among 12-23 months of age children in Ethiopia reported that full immunization status among children whose mothers age 15–24, 25–34 and 35–49 was 24.4 %, 24 % and 25.1 %, respectively (Lakew, Bekele and Biadgilign, 2015).

Anello et al., (2017) in a study carried out in Italy on childhood immunization revealed that, the number of unvaccinated children against measles, mumps and rubella increased with time. Very old and very young mothers (over 35 and below 25 years) were less likely to have their children fully immunized. Poor compliance to immunization among young mothers was attributed to lack of experience with nurturing of children while older mothers were complacent about the possibility of their children being highly affected by the immunizable diseases. This could be attributed to lack of enough knowledge about the importance of childhood vaccination.

Negussie et al., (2016) in a case control study that investigated factors associated with incomplete childhood immunization in Arbegona district, southern Ethiopia found out that the risk of defaulting their child's vaccine series is higher in younger mothers than older mothers.

The percentage of children fully immunized in totality and along the individual vaccines increased with the mother's age where 64% of children whose mothers were in 45-49 years' age- cohort were fully immunized compared to 36% of children whose mothers were in the 15-19 years' age-cohort. A similar pattern was observed for the full dose of the individual vaccines. Children whose mothers were in 20-49 years' age-cohort increased the probability of being fully immunized, receiving DPT, polio and measles vaccine by 9-30%, 5-23%, 9-23%, and 13- 35% respectively. In Kenya young age of mothers was associated with high immunization coverage as compared with the older mother (Kamau and Esami 2001).

2.3.2 Level of education

Hu, et al., (2016) in a cross-sectional survey was conducted among migrant mothers by using a questionnaire, showed high completion of immunization among mothers with adequate levels of education. Findings showed that immigrants who had adequate knowledge about immunization 'fully immunized' their children. These mothers were familiarity with

immunization from the health talks they had received on their entrance at the borders. This was because they could easily read and understand the information displayed in immunization centers. This enabled them to know when to come back for next immunization schedule.

A study by Odiit and Amuge, (2003) on comparison of vaccination status of children born in health units and those born at home. The children of parents with higher formal education were more likely to be up to date for vaccination compared with children of parents with either low or no education.

In a study carried out in Enugu Nigeria by Okoroa et al., (2015) revealed that, low child immunization was associated with low parental education attainment especially the mother. Larger numbers of children whose mothers had lower levels of education had low immunization coverage as compared to respondents who had tertiary education. Similar results were reported by Wu, Li and Zhou (2016) in a study carried out in China where low maternal education was associated with lack of adequate information on the importance of vaccination to children. This is because mothers are in most cases the immediate caretakers of children below 2 years and spend more time with the children more than any one as compared to men. Similar findings were reported by Russo et al., (2015) in a cross-sectional study on vaccine coverage and determinants of incomplete vaccination in children aged 12-23 months in Dschang, West Region, Cameroon.

In a study on vaccination coverage and immunization timeliness among children aged 12-23 months in Senegal, Salam et al., (2017) reported that children of mothers with a primary education level were 22% more likely to receive the Penta 3 vaccine higher at a given age compared to children born to women with no education at that age. Similarly, women with secondary education or higher were 20% more likely to receive Penta 3 vaccine as compared to women without education level.

2.3.3 Employment status

Funmilayo, (2015) in a study presented to the University of Witwatersrand on factors for full child immunization among children between 1 and 2 years in Nigeria reported that, mothers from a higher wealth quantile were highly more likely to have their children fully immunized unlike those born from mothers with low incomes and lower wealth index.

Similarly, Lakew, et al., (2015) in a study carried out in Ethiopia where wealth was categorized in three classes that is; poor, middle and rich. There was a great difference between the poor and the rich where it ranged between 17.4% and 61.9%.

Bbaale, (2013) in a study on factors influencing childhood immunization in Uganda reported that children whose mothers were in agriculture and blue-collar jobs reduced the probability of receiving the 3 doses of DPT by 8% and 5% respectively compared to the counterparts whose mothers had white-collar jobs. Similarly, children whose fathers were in agriculture and blue-collar jobs reduced the probability of being fully immunized and immunized against measles by 8-10% and 11-15% respectively. 66% of children whose mothers had a white-collar job were fully immunized compared to 53%, 54%, and 57% of children whose mothers were in blue-collar jobs, agriculture, and services respectively.

2.3.4 Knowledge on immunization and vaccine preventable diseases

Awasthi, Pandey, Singh, Kumar and Singh (2014) in a study carried out in India, revealed that, mothers who had low knowledge about childhood immunization were less complaint to completion of their children immunization schedules as compared to mothers who adequate knowledge about childhood immunization. Failure to know who should spearhead child immunization, where should it be done and when children should be vaccinated were directly related to missing of the immunization schedules and lack of completion as also reported in studies done in Nigeria and Uganda (Nankabirwa et al., 2010).

Negussie et al., (2016) in a case control study that investigated factors associated with incomplete childhood immunization in Arbegona district, southern Ethiopia found out that mothers who didn't know the benefits of vaccination were five times more likely to have defaulter children than their counterparts.

Zagminas et al. (2007) assessed parents' knowledge on immunization and noted that most of the respondents can be characterized as having a positive opinion about vaccination, although 20-40% of respondents indicated insufficient knowledge on this issue. Greater concern about the safety of vaccines was expressed by older parents, residents of towns and highly educated individuals (Rogalska, Augustynowicz, Gzyl, and Stefanoff, 2010). Majority of them did not believe that the vaccines used to immunize the children were safe enough to fully be relied upon in the prevention of childhood dangerous diseases.

Significant variations between mothers and fathers in knowledge had been observed in the current study. Mothers almost in all cases used to accompany their children to immunization visits. Communication with healthcare providers may be responsible for the observed difference in mothers' knowledge compared to father's awareness. Significant differences were documented in knowledge and attitudes of parents who were living in the city compared to those who were residing outside the town. This may be explained by the difference in educational level or may be due to variation in the provided health services.

In a study carried out in Thailand, Canavati et al., (2011) found out that, most of the mothers were not aware of the importance of immunization while others could not meet the immunization costs especially in term of transport costs.

Jani et al.,(2008) in a cross sectional study on risk factors for incomplete vaccination and missed opportunity for immunization in rural Mozambique reported that only 142 (21.2%) mothers had heard about the EPI as a specific program. The major sources of information for this knowledge were the health facility (67, 47.1%), the radio (44, 30.9%), community workers (25, 17.6%) and family and friends (14, 9.8%). Vaccination was considered to be important by 642 mothers (96.1%) while 606 mothers (90.7%) did not know any contra-indication for immunization. However, only 423 (63.3%) knew that the vaccination program should be finished at the age of nine months with the measles vaccine.

A case-control study on determinants of defaulting from completion of child immunization in Laelay Adiabo District, Tigray Region, Northern Ethiopia that was carried out by Aregawi et al., (2017) reported that 84 mothers of cases (93.3%) and 172 controls (95.6%) had heard about childhood vaccination and vaccine preventable diseases, and 31 mothers of the cases (34.4%) and 93 controls (51.7%) could name five or more types of vaccine preventable diseases. Almost all mothers of cases (98.9%) and controls (99.4%) knew the local vaccination dates, but only 38 mothers of cases (42.2%) and 105 controls (58.3%) knew the child vaccination schedules. 29 mothers of cases (32.2%) and 104 controls (57.8%) knew when a child should begin immunization. Most 71 mothers of cases (78.9%) and 174 controls (96.7%) knew when to return for second/third vaccinations. Eighty-two mothers of cases (91.1%) and 179 controls (99.4%) were acquainted with the age when a child should complete immunization. 32 mothers of cases (35.6%) and 111 controls (61.7%) were acquainted with the total number of sessions to complete child immunization.

2.3.5 Attitude on immunization

A cross sectional study by Kamanda, (2010) on immunization coverage and factors associated with failure to complete childhood immunization in Kawempe Division, Uganda reported that almost all respondents believed that the attitude of mothers was important in enhancing utilization of immunization services in Kawempe Division due to the fact that in an African setting women play a fundamental role in health up bring of children. 63.2% of the respondents indicated that anti-vaccine rumors do not affect the use of immunization services because a lot of advocacy has been done by all the stake holders and it is hoped that in the years to come more Ugandans will have a positive attitude towards immunization. Similar findings were reported by Russo et al., (2015) where 85.4 % of the parents had a positive attitude towards immunization and therefore they were more likely to be fully vaccinated.

Negussie et al.,(2016) in a case - Control study on factors associated with incomplete childhood immunization in Arbegona district, southern Ethiopia reported that half of the mothers from both groups had a positive attitude towards the last received child immunization service.

2.3.6 Availability of child health card

Having an immunization card is shown to be important for full immunization. Children having immunization cards that were seen by the interviewer increased the probability of being fully immunized, receiving BCG, DPT, polio vaccine, and measles vaccine by 67%, 72% , 8% , 76% , and 64% respectively compared to the counterparts who had no card at all (Bbaale, 2013).

A study on Comparison of vaccination status of children born in health units and those born at home reported that only 94 (19%) children had a child health card brought along during the clinic visit (Odiit and Amuge, 2003). A community-based cross-sectional study on timeliness of childhood vaccinations in Kampala Uganda by Babirye et al., (2012) reported that 79 (8.8%) were excluded from full data collection due to misplaced or lost cards (72.2%), child health cards had been destroyed by fire or eaten by rats (7.6%).

A study on vaccination coverage and immunization timeliness among children aged 12-23 months in Senegal found out that the proportion of children with available vaccination cards was 69.74%. (Salam et al., 2017).

A cross-sectional study on immunization coverage and its determinants among children aged 12-23 months in Atakumosa-west district, Osun State Nigeria reported that 475 possessed vaccination cards, indicating a vaccination card retention rate of 63.3 % (Adedire et al., 2016).

Lakew, Bekele and Biadgilign, (2015) in a study on Factors influencing full immunization coverage among 12-23 months of age children in Ethiopia reported that when there was no vaccination card available for the child or if a vaccine had not been recorded on the card as being given, the respondent was asked to recall the vaccines given to her child. Similar findings were reported by Bbaale, (2013) in a study on factors influencing childhood immunization in Uganda.

2.3.7 Number of antenatal care visits

A cross sectional study on factors associated with full immunization coverage amongst children aged 12 –23 months in Zimbabwe revealed that children whose mothers had 4 and above ante-natal care visits were 3 times more likely to be vaccinated than children whose mothers did not receive ante-natal care. Children whose mothers had less than 4 ante-natal care visits were more than 2 times more likely to be fully vaccinated than children whose mothers did not receive ante-natal care (Mukungwa, 2015).

Similar findings were reported in a cross-sectional household survey on vaccine coverage and determinants of incomplete vaccination in children aged 12-23 months in Dschang, West Region, Cameroon reported that children of mothers who had more than 3 ante-natal care visits and at least one postnatal visit had better immunization coverage compared to mothers whose antenatal visits were less than 3 (Russo et al., 2015).

A community based unmatched case control study on factors associated with incomplete childhood vaccination among children 12-23 months of age in Machakel Woreda, East Gojjam zone revealed that children who were born from mothers who had no antenatal care visit during pregnancy were 2.549 times more likely to default to complete vaccination compared to infants who were born from mothers who had antenatal care visit during pregnancy (Kindie Yenit, 2015). Similar findings were reported by (Etana and Deressa, 2012).

2.4 Health facility related factors influencing completion of the immunization schedule of children aged below 2 years

2.4.1 Distance from health facility

The Mother's distance to health center is a considerable barrier affecting adherence to EPI (Beaven Andrew A. Atienza, Bella Rea S. Abing, Van Lendl T. Calibugar, 2016). Xeuatvongsa et al., (2017) in a cross-sectional study stated that distance to the nearest health facilities is one of the well-known factors associated with vaccination status. Victoria et al., (2011) in a study carried out in Brazil found out that direct access to health care significantly influences fully immunization of the children. Mothers who were near health care facilities had more of their children immunized because mothers could easily visit health care facilities. Most of the mothers never incurred money for transport to the immunization centers thus higher rates of immunization. Similar findings had early been reported by Logullo et al., (2008) where they attributed accessibility to health care to increased number of public health care facilities built all over the country.

In a cross sectional study done in India, Assam district showed that immunization status of the children was significantly higher where the distance of the health center was less than 2km compared with those residing in remote inaccessible areas with a distance of more than km to the health center. Families nearer to the health facility are more likely to complete the immunization than those far from it (Rup KP, et al., 2008).

Mukungwa, (2015) in a study on factors associated with full immunization coverage amongst children aged 12 –23 months in Zimbabwe reported that children whose mothers indicated that the distance to the health facility was no big problem were more likely to be fully vaccinated (68%) as compared to children whose mothers indicated that the distance was a big problem (62%).

2.4.2 Reported side effects of vaccines

Lack of medical knowledge within immunization for one's child, means that a caretaker does not know about standards of procedures, such as scheduled times of vaccination, or understands the medical basis of vaccines, for instance how it works and of possible side-effects. This can cause a caretaker not to undertake vaccination (Karlsson, 2012).

2.4.3 Attitude of health care workers

In a study by Cutts and Hanson, (2016) that analyzed the administration of immunization programs had immunization cards felt shame and stigmatized to take their children for other courses of immunization thus failed full immunization coverage. Most of them feared the ruthless the health workers would subject them to which would reflect them to appear as careless mothers. They instead chose not to immunize their children.

Similar findings were reported in a study carried out in Uganda where Babirye et al., (2012) noted that, mothers from low income quantile never fully immunized their children because they feared being ashamed by the shabby and untidy tires of their children before other mothers.

Rahji and Ndikom,(2013) reported that 60.8% agreed with the statement that health workers behaviour discouraged compliance. This is in line with findings by Babalola and Adewuyi (2005) WHO cited Provider's attitudes and long waiting period as few reasons by mothers for not taking additional immunization for their children. Indeed a few women were frustrated because they had visited the facility more than one time with no vaccines on ground, absence of service providers or disrespectful providers.

Similar findings were reported by Oku et al., (2017) who stated that caregivers had varying opinions regarding the way in which health workers communicated with them. Some described health workers as being warm and friendly and treating them with respect. However, a few caregivers described the impolite behavior of health workers towards women with low levels of education, teenage mothers and mothers who arrived late or forgot their vaccination cards. They explained that this behavior could undermine trust in the health workers and could also discourage caregivers from listening to health education messages. One caregiver explained that once a mother is treated inappropriately, she may become resistant to any information delivered by the health worker and may resolve not to return to the health facility to continue with her child's vaccination.

2.4.4 Availability of vaccines

Unavailability of vaccines is one of the most common barriers to immunization adherence in this study. This not only hinder mothers to comply with the present vaccination schedule but this may prevent mothers from coming back in the future as mothers may presume to be in the same predicament on the next appointment. In the Dominican Republic, 90% of mothers

reported that the staff treated them right due to lack of vaccine and vaccinator (Favin et al., 2012).

It was noted in Armenia that the primary causative factor for low or non-immunization was lack of vaccine (WHO, 2012). When parents travel far, miss work, spend more time waiting and then cannot have their kids immunize due to of lack of resources, chances of going back is slim.

A significant amount of studies supported the fact that health facilities was found to have inefficient cold chain or lack of vaccines. Vaccines are not available because of no funding, poor distribution systems, and other reasons (Beaven Andrew A. Atienza, Bella Rea S. Abing, Van Lendl T. Calibugar, 2016). With shortage of immunization supplies they may miss being vaccinated on that day, which can consequently discourage future compliance. In Africa and Asia studies reported that the major reason of vaccination problem are insufficient supplies especially vaccines and inadequate vaccine information (Streefland and Chowdhury, 1999).

2.4.5 Health education

Health workers not giving explanation or not providing clear information about the vaccine is the strongest impediments for vaccination compliance. Health workers often communicate poorly and little with mothers, so that many mothers complained of not being informed about return date what to do with the vaccines side effects (Beaven Andrew A. Atienza, Bella Rea S. Abing, Van Lendl T. Calibugar, 2016).

Similar observations have been reported earlier in Nigeria and Rajasthan-India. The higher levels of knowledge on the symptoms of pneumonia (69%) and on a preventive method (97%) found amongst parents/guardians which is similar to that reported in the study by Odusanya et al., (2008). This may be attributed to the content of information given to them during antenatal visits. The fact that only 19% of the participants were aware of the availability of the PCV in our study stresses the need for an improvement in the quality of health information on pneumonia disease burden and prevention. However, this differs from the low rate (4%) of knowledge about Oral Polio Vaccine (OPV) reported in a Niger study, and the low rate of awareness (1%) that measles was vaccine-preventable in another study in Nigeria.

In a cross sectional study conducted among mothers having one-year-old child carried out by Nisar, Mirza and Qadri, (2010) at Mawatch Goth, Kemari town, Karachi Pakistan, stated that having ever received information about childhood immunization from the health care providers was associated with completion of child immunization.

Findings also showed that 70% of the mothers who were health educated completed the routine immunization of their children and most of them started the immunization early enough. The remaining 30% who missed out on immunization had not received enough information while others were busy with domestic work.

Several studies found out that parents of partially immunized child noted lack of promotion or follow-up of routine immunization as an obstacle for not having their children vaccinated (Bahnot, Srivastava and Karishma, 2004). Far too many parents leave sessions without knowing important information about return visits, side effects, etc. Benin, a review about EPI found that one of the major barriers to vaccination was mother's lack of knowledge of return date for immunization. Health workers in Somalia did not offer instruction about immunization side effects. This poor communication by health workers can lower adherence rate (Beaven Andrew A. Atienza, Bella Rea S. Abing, Van Lendl T. Calibugar, 2016).

2.4.6 Distance to the health facility

Logullo et al., (2008) in a case control study on factors affecting compliance with the measles vaccination schedule in a Brazilian city revealed that, the length of the distance to the health care facility was very significant in completion of childhood immunization. Caretakers who lived far away from health care facilities and had low incomes were less likely to complete the immunization schedule for their children because they lacked money for transport to health care facilities. Another study in Brazil explained that Konstanyner, Taddei and Rodrigues, (2011) reported that living away from the health care unit was associated with incurring costs for the vaccines as the mothers could not meet the immunization program.

In studies carried out in Sudan, Cameroon and Pakistan distance was found to be significantly associated with completion of childhood immunization. Russo et al., (2015) in a study carried out in the Western Region of Cameroon called Dschang, found out that mothers that stayed in distances longer than 5 km from health care facilities had low rates of childhood immunization completion here this was commonly low DTP3 coverage. Similar results were reported in Pakistan by Usman et al., (2010) where mothers who lived more than 2 km from the immunization centers had most of their children not fully immunized.

This was coupled with the strict cultural norms that never freely allowed mothers to move for long distances from homes without the accompaniment of their male partners. Another explanation was that, time spent to access the vaccination center was too costly to most mothers as most of them were low income earners with inadequate support from their spouses.

CHAPTER THREE: METHODOLOGY

3.0 Introduction

In this chapter, the description of the research method is given. It includes the study design, study setting, study population, sample size determination, sampling method, definition of study variables, data collection method and tools, quality control for data, data presentation and analysis, ethical issues, limitations of the study, and plan for dissemination of the study results.

3.1 Study Design

The study was a descriptive cross-sectional study which employed quantitative data collection method. This enabled the researcher to describe the characteristics of the study population which were representative of the general population in order to collect data at a single point in time. Quantitative data collection method was used because it enabled the researcher to collect numerical data and perform quantitative analysis using statistical procedures.

3.2 Study Setting

The study was carried out in three villages of Kyamabaale, Kyamuyiisa and Kayunga in Madu community, Madu Sub County in Gomba District. This study setting was selected because no research on immunization has been conducted in the three selected villages in Gomba district.

3.3 Sources of data

3.3.1 Primary data

Information was obtained directly from the mothers /care takers through researcher administered questionnaires.

3.3.2 Secondary data

This information was obtained from journals, electronic books, library books, research dissertations, learning websites, etc.

3.4 Study Population

The study population comprised of parents or guardians/ caretakers of children less than 2 years of age. The target population comprised of all parents and guardians of children less than 2 years of age who are residing in three villages selected from Madu parish as earlier noted. This age group was chosen because most immunization programs by the Ministry of

Health always target children within this age group and they are most vulnerable to immunizable diseases. Care takers were considered since they are responsible for making decisions to take children for immunization.

3.5 Eligibility criteria

3.5.1 Inclusion criteria

The study population included the following;

- i. All care takers/mothers of children between 1-2 years of age
- ii. Caretakers who consented to participate in the study
- iii. Care takers who are residents of three villages of Kyamabaale, Kyamuyiisa and Kayunga in Madu community in Gomba district for more than three months.

3.5.2 Exclusion criteria

The researcher did not consider the following for the study;

All caretakers who had lived in Madu community in Gomba district for less than three months. Care takers who were deaf or dumb, mentally ill or the very ill were also excluded from the study.

3.6 Sample Size Determination

The sample size was determined using the Kish and Leslie sample size formula given below, (Kish, and Leslie, 1965).

$$N = \frac{Z^2 PQ}{D^2}$$

Where: N = The required sample size

Z = The confidence level at 95% (standard value of 1.96)

D = Precision given as +/-0.05 (Margin of error)

P= Proportion of children that received all basic vaccinations is 55.8% (Uganda Bureau of Statistics, 2016)

Q = (1-P).

$$N = \frac{1.96 \times 1.96 \times 0.558 \times 0.442}{0.05^2}$$

$$N = \frac{3.841 \times 0.247}{0.0025}$$

$$N = \frac{0.948727}{0.0025}$$

N= 379 Respondents

Therefore, 380 respondents participate in the study.

3.7 Sampling technique and procedure

3.7.1 Sampling technique

Both probability and non-probability sampling methods were used in the study. Purposive sampling was used to select the **three** villages that included, Kyamuyiisa, Kyamabaale and Kayunga. These were chosen because the villages were within the reach of the researcher.

Simple random sampling was then used to select caretakers for the study. This ensured that every caretaker has an equal chance of being selected to participate in the study.

3.7.2 Sampling procedure

The researcher used simple random sampling to select the 126 respondents from each village. The researcher wrote papers were written on ‘YES’ and ‘NO’. The researcher then moved from home to home with the help of the area local administrator or the Local Council chairperson, secretary for information, and women and child affairs to carry out the study.

On reaching the home, the researcher asked whether there is a mother or care taker (an adult) of children below 2 years. In case they were available, the researcher explained to them the purpose of the study and sought their consent to participate in the study. After they consented, they were asked to pick a paper from the container and if they pick YES, they were selected for the study. This was done until the desired sample size for the study was achieved.

3.8 Study Variables

3.8.1 Dependent variable

Completion of the immunization schedule

3.8.2 Independent variables

The independent variables were the factors associated with completion of the immunization schedule. These included;

- i. **Child related factors** which included; Child’s age and birth order, Place of birth, Sex of child, Child health card availability
- ii. **Caregiver related factors** which included; Age, Level of education, Employment status Perceptions of vaccines, Knowledge on immunization.
- iii. **Health facility related factors** which included; Distance from health facility, Reported side effects of vaccines, Attitude of health workers, Availability of vaccines and Health education.

3.9 Data collection methods and tools

Quantitative data was collected using structured questionnaires. The questionnaire contained both close ended and open-ended questions on child related factors, care-taker related factors and health care related factors influencing completion of childhood immunization.

3.10 Data analysis

Questionnaires were checked for completeness. Data was cleaned, coded and data entered in Microsoft excel. Quantitative data was then entered into Statistical Package for Social Sciences (SPSS) Version 20, summarized in frequency tables, Graphs and pie chart. Bivariate analysis was attained through Chi-square tests which helped to establish the most significant factors within variables. Multi variate analysis was then be done to assess factors influencing completion of the immunization schedule of children below 2 years among mothers of Madu Community in Gomba district between March to May 2018.

3.11 Quality control issues

Quality control measures was put in place to ensure validity and reliability of collected data in the following ways;

- i. The researcher developed a semi-structured questionnaire which was pretested on nine respondents in Madu A village which was 10% (38 respondents) of the sample size before application to the study area since it has a similar setting.
- ii. There was translation of questionnaires into Luganda language which as the local language understood by the majority of the respondents.
- iii. The research assistants were trained by the principle investigator to assist in administration of questionnaires.
- iv. Questionnaires were checked for consistence and completeness of information obtained from the study participants so as to ensure reliability of the collected information.
- v. Before closure, all questionnaires were double checked for completeness and approved for storage by the principal investigator. Questionnaires were kept in safety lockers under lock and key and were only be accessible by the principal investigator.

3.12 Ethical consideration

All study protocols were presented for review and approval by institutional review board of International Health Sciences University School of Nursing sciences and the local administration of Madu parish. Written informed consent was sought from all study participants before enrolment into study. No participant was coerced to participate in the study. Respondents were informed of their rights especially the right to refuse to participate in the study at any stage, should they feel so. For all collected data, confidentiality was maintained using participant identifiers instead of names. Data was safely stored in a safety box under lock and key only accessible to the study investigator.

The questionnaire was first be pre-tested in another similar setting that checked for applicability, accuracy and consistency of collected data before beginning the study. The questionnaire was written in English. The questionnaire was administered with the help of research assistants who were trained by the principal investigator before beginning of study.

3.13 Limitations of the study

Data on factors influencing completion of the immunization schedule of children aged below 2 years in Madu Parish Gomba district was collected by self-report. The researcher anticipated to face the following challenges;

- i. Some respondents feared to reveal their real opinion due to fear of the perceived negative effects of immunization.
- ii. There was recall bias where the respondents forgot some of the information relevant to the study.

3.14 Plan for dissemination

Results from the study were presented in form of a dissertation which will be submitted to Clarke International University and the local administration of Madu parish. A manuscript will be written for submission to a medical journal and presentation to various conferences.

CHAPTER FOUR: PRESENTATION OF RESULTS

4.0 Introduction

This chapter presents findings from the study. These are presented according to the objectives of the study. 380 participants were invited to participate in this study, 100% of the respondents fully completed the study making 100% response rate

4.1 Socio-demographic characteristics of the respondents

Table 1: Socio-demographic characteristics of the respondents (n=380)

Characteristics	Attributes	frequency	percentage
Age in complete years	<Less than 20	74	19.5
	21-29	184	48.4
	29-39	84	22.1
	>40	38	10
Highest level of education completed	No formal education attained	197	51.8
	Primary	58	15.3
	Secondary	88	23.2
	Post-Secondary	37	9.7
Marital status	Married	225	59.2
	Single	90	23.7
	Divorced	51	13.4
	Cohabiting	14	3.7
Occupation	Housewife	219	57.6
	Civil servant	20	5.3
	Self employed	82	21.6
	Others	59	15.5
Age of child in months	12-15	104	27.4
	16-19	199	52.4
	20-23	77	20.3
Sex of children you have	Female	196	51.6
	Male	184	48.4
Number of ANC visits	<4 visits	209	55
	Up to or more than 4	154	40.5
	No visits	17	4.5
Place of Delivery	Health facility	290	76.3
	Non-health facility based	90	23.7
Number of children	1	100	26.3
	2	131	34.5
	More than 2	149	39.2

Source: Primary data

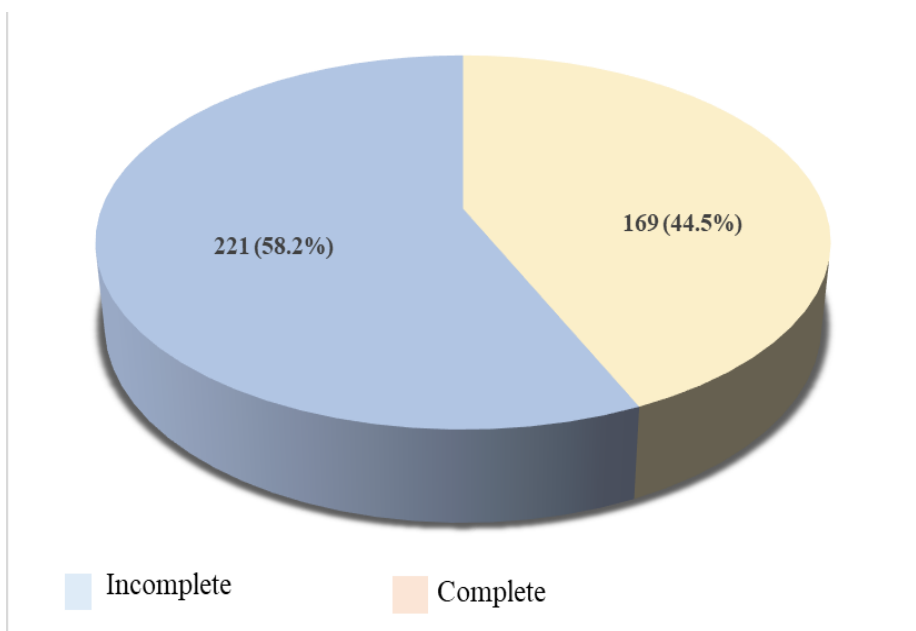
Table 1 above shows the socio-demographic characteristics of the respondents. The mean age of the care takers was 27 years (S.D =7). Majority of the care takers were age 21-29 years 184 (48.4%). Slightly more than half 197 (51.8%) of the care takers had attained no formal

education. More than half 225 (59.2%) of the respondents were married whereas 219 (57.6%) of the respondents were house wives.

Most 196 (51.6%) of the respondents had more female children compared to the male children 184 (48.4%). With regards number of children, majority 149 (39.2%) of the respondents had more than 2 children mainly aged between 16 to 19 months 199 (52.4%) at the time of data collection. Most 209 (55%) of the respondents reported that they had attended less than 4 ANC visits while as 17 (4.5%) had not attended any ANC visit. This may be attributed to the long distances mothers have to travel and lack of transport fares.

4.2 Completion of Immunization

Figure 1: Showing completion of the immunisation schedule



Source: Primary data

Figure 1 above shows that 169 (44.5%) of the children had full immunization while 221 (58.2%) of the children had incomplete immunization.

Table 2: Distribution of doses missed and completed (n=380)

<i>Vaccine</i>	<i>Doses</i>	Completion rate	
		n=380	%
<i>Polio</i>	Only Polio 0	14	3.7
	Up to Polio 1	38	10
	Up to Polio 2	154	40.5
	All 4 Doses	175	45.8
<i>DPT-HIB-HEP</i>	Completed all vaccines	12	3.2
	DPT 2 missed	104	27.4
	DPT 3 missed	264	69.5
<i>BCG</i>	At birth	380	100
<i>Measles</i>	Complete	278	73.2
	Missed	102	26.8
<i>PCV doses</i>	Completed	196	51.6
	PCV1 missed	21	5.5
	PCV2 missed	72	18.9
	PCV3 missed	91	23.9

Source: Primary field data

Table 2 above shows that; regarding to distribution of specific vaccine doses completed, all children received BCG dose given at birth, less than half of the children 175 (45.8%) completed all the polio, 264 (69.5%) of the children missed the doses of DPT 3, 27.4% missed the second dose of DPT-HIB-HEP while only 27 (3.2%) received ally the doses of DPT-HIB-HEP. Majority of the respondents reported that their children received the measles dose 278 (73.2%) while only 102 (26.8%) missed the measles vaccine. Regarding PCV, slightly more than half 196 (51.6%) of the children completed all the PCV doses.

4.3 Immunisation related knowledge of the respondents

Table 3: Immunisation related knowledge of the respondents (n=380)

Charactersitics	Attribute	Frequency (n=380)	Percentage (%)
Aware of what immunisation is.	Protection of children against the VPDs	147	38.7
	Way of providing protection against diseases caused by infections	52	13.7
	Immunization prevents children from sickness and diseases	181	47.6
Ever received information on immunisation	Yes	279	73.4
	No	101	26.6
what is the right age for completing immunisation	At 6 months	133	35
	At 9 months	22	5.8
	1 year	225	59.2
What is right age for starting immunisation	At birth	304	80
	Other	76	20
Know the vaccines given to children at each schedule	Yes	247	65
	No	133	35
Ever missed an immunization shedule	No	164	43.2
	Yes	216	56.8

Source: Primary data

Table 3 above shows that 181 (47.6%) of the participants reported that immunization prevents children from sickness and diseases. The highest proportion 279 (73.4%) of the participants also reported that they had ever received information no immunisation. In fact, more than half 225 (59.2%) of the respodents knew the right age for completing (9 months or I year) while 304 (80%) of the respondents knew the right age of starting immunization (At birth). In addition, most respondents 247(65%) reported that they were aware of the vaccines given to child at each schedule. Regarding missing of immunisation schedules, most 216 (56.8%) of the respondents reported that they had ever missed a schedule.

4.4 Individual attitude towards immunisation

Table 4: Individual attitude towards immunisation

Charactersites	Attribute	Frequency (n=380)	Percentage (%)
Immunization protects against immunisable diseases	Strongly agree	358	94.2
	Agree	1	0.3
	Disagree	21	5.5
I can advise another person to immunise their child	Agree	352	92.6
	Disagree	28	7.4
Trust vaccines given to the children	Yes	276	72.6
	No	104	27.4
Know the vaccines given to children	Yes	247	65
	No	133	35
Child has ever experienced moderate to severe side effects following immunisation	Yes	70	18.4
	No	310	81.6
Reasons reported for missing immunisation schedules	Lack of time	220	57.9
	Unable to go to health center due to fatigue	71	18.7
	Lack of transport	44	11.6
	Arrived late	45	11.8

Source: Primary data

Table 4 above shows that most 358 (94.2%) of respondents believed that immunisation was important while only 21 (5.5%) thought that immunisation was not that important. Majority 352 (92.6%) of the respondents reported: they could advise others to immunise their children whereas 276 (72.6%) of the respondents trusted vaccines given to their children. Most 310 (81.6%) of the respondents reported that their children had never experienced moderate to severe side effects following immunisation. Various reasons were cited for missing immunisation schedules, they included; lack of time 220 (57.9%), failed to go to health center due to fatigue 71 (18.7%), lack of transport 44 (11.6%) and arriving late at the immunisation center 45 (11.8%).

4.5 Health facility related characteristics of the respondents

Table 5: Health facility related characteristics of the respondents n=380

Charactersits	Attribute	Frequency (n=380)	Percentage (%)
Distance to nearest health facility	<5 km	238	62.6
	>5km	142	37.4
Means of transport to health facility	Foot	337	88.7
	Vehicles	43	11.3
Sometimes immunisation is not available at the facility	Yes	174	45.8
	No	206	54.2
Receive health education talks at the facility	Yes	227	59.7
	No	153	40.3
Percieved attitude of HCWs	Positive	299	78.7
	Negative	81	21.3
Availability of HCWS	Accessible	321	84.5
	Not accessible	59	15.5
Suggestions to improve immunisation practices	More vaccines should be available.	154	40.5
	Reduce waiting time	184	48.4
	Unrestricted immunisation days.	22	5.8
	More friendly services to parents	20	5.3

Source: Primary field data

Table 5 shows that 238 (62.6%) of the respondents lived less than 5 km from the nearest immunisation center and used foot 337 (88.7%) of them walk to the health facility. Majority 174 (45.8%) of the respondents reported that immunisations were always available at the health facility while, a significant number 206 (54.2%) of respondents reported that sometimes immunisations were not available at the facility. The highest percentage 227 (59.7%) of respondents had ever received health education talks about immunisation however and 153 (40.3%) of them never received information on immunisation. More than three thirds 299 (78.7%) of the respondents reported that the HCWS had positive attitude towards them and they were accessible 321 (84.5%) during immunisation days. Various suggestions to improve immunisation were given by the respondents, these included; 154 (40.5%), suggested that more vaccines should be available, 184 (48.4%), suggested to reduce on waiting time while 22 (5.8%) suggested to reduce restricted days for immunisations and 20 (5.3%) suggested more friendlier services to parents.

4.6 Bivariate correlation between immunization completion and other Independent variables

Table 6: Bivariate relationship between socio-demographic characteristics of respondents and completion of immunisation. n=380

Characteristics	Attributes	Immunization completion (n=380)				p-value
		YES	%	NO	%	
Age in complete years. *	<Less than 20	36	21.3	38	18	0.003
	20-29	92	54.4	92	43.6	
	29-39	27	16	57	27	
	>40	14	8.3	24	11.4	
Highest level of education completed	No education	91	53.8	106	50.2	0.76
	Primary	24	14.2	34	16.1	
	Secondary	36	21.3	52	24.6	
	Post-Secondary	18	10.7	19	9	
Marital status*	Married	85	50.3	140	66.4	0.003
	single	54	32	36	17.1	
	divorced					
	Cohabiting					
Occupation	Housewife	99	58.6	120	56.9	0.85
	Civil servant	7	4.1	13	6.2	
	Self employed	37	21.9	45	21.3	
	Others	26	15.4	33	15.6	
Age of child in months. *	12-15	43	25.4	61	28.9	0.006
	16-19	96	56.8	103	48.8	
	20-23	30	17.8	47	22.3	
Sex of child *	Female	72	42.6	124	58.8	0.001
	Male	97	57.4	87	41.2	
Number of ANC visits	Less than 4 visits	103	60.9	106	50.2	0.109
	60	35.5	94	44.5		
	More than 4	6	3.6	11	5.2	
	No visits					
Place of Delivery*	Health facility	116	68.6	174	82.5	0.002
	Home	53	31.4	37	17.5	
Child's birth order	1	42	24.9	58	27.5	0.02
	2	48	28.4	83	39.3	
	More than 2	79	46.7	70	33.2	

Source: Primary field data *Statistically significant variables

Table 6 shows that; socio-demographic factors including; age of the care taker ($p < 0.003$), marital status ($p < 0.003$), age of the child ($p < 0.006$), sex of the child ($p < 0.001$), place of delivery of current child ($p < 0.002$), and child's birth order ($p = 0.02$) were statistically associated with completion of immunisation while as highest level of education, occupation, number of ANC visits attended were not statistically associated with immunisation completion at bivariate level of analysis.

4.7 Correlation between knowledge aspects on immunization and immunization completion.

Table 7: Bivariate relationship between knowledge aspects on immunization and immunization completion.

Characteristics	Attributes	Immunization completion (n=380)				p-value
		YES	%	NO	%	
Aware of what immunisation is *	Protection of children against the VPDs	61	36.1	86	40.8	0.024
	Way of providing protection against diseases caused by infections.	16	9.5	36	17.1	
	Immunization prevents children from sickness and diseases	92	54.4	89	42.2	
Ever received information on immunisation.	Yes	115	68	54	32	0.106
	No	112	53.1	99	46.9	
What is right age for starting immunisation *	At birth	143	84.6	161	76.3	0.042
	Six months after birth	26	15.4	50	23.7	
What is the right age for completing immunisation *	At 6 months	52	30.8	81	38.4	0.044
	At 9 months	6	3.6	16	7.6	
	1 year	111	65.7	114	54	
Knowledge on vaccine preventable diseases	Yes	108	63.9	139	65.9	0.69
	No	61	34.1	72	36.1	
Ever missed an immunization shedule *	No	90	53.6	74	35.1	<0.001
	Yes	78	46.4	137	64.9	

Source: Primary field data, * Statistically significant variables

Table 7 above shows that immunisation completion was correlated to knowledge of: what immunisation is ($p < 0.024$), right age of completing ($p = 0.042$) and starting immunisation ($p = 0.044$). Missing one or more of the scheduled immunisation schedules was also significantly related to immunisation completion ($p < 0.001$).

4.8 Correlation between immunization completion and individual's attitude towards immunization

Table 8: Showing relationship between immunization completion and individual's attitude towards immunization n=380

Characteristics	Attributes	Immunization completion				p-value
		Yes	%	No	%	
Immunization protects against immunisable diseases	Strongly agree	163	96.4	195	92.4	0.211
	Agree	0	0	1	0.5	
	Disagree	6	3.6	15	7.1	
I can advise another person to immunise their child	Strongly agree	163	96.4	195	92.4	0.91
	Disagree	6	3.6	16	7.6	
Trust vaccines given to the children	Yes	126	74.6	150	71.1	0.451
	No	43	25.4	61	28.9	
Child has ever experienced moderate to severe side effects following immunisation *	Yes	46	27.2	24	11.4	<0.001
	No	123	72.8	187	88.6	

Source: Primary field data * statistically significant variables

Table 8 above shows that; regarding individual attitude towards immunization, completion of immunization was significantly associated with experience of side effects following immunization ($p < 0.001$).

4.9 Relationship between immunization completion and health facility related characteristics of the respondents

Table 9: Showing relationship between immunization completion and health facility related characteristics of the respondents n=380

Characteristics	Attributes	Immunization completion				P-value
		Yes	%	No	%	
Distance to nearest health facility	<5 km	114	67.5	124	58.8	0.08
	>5km	55	32.5	87	41.2	
Means of transport to health facility	Foot	150	88.8	187	88.6	0.96
	Vehicle	19	11.2	24	11.4	
Sometimes immunisation is not available at the facility	Yes	68	40.2	106	50.2	0.52
	No	101	59.8	105	49.8	
Receive health education talks at the facility	Yes	115	68	112	53.1	0.003
	No	54	32	99	46.9	
Perceived attitude of HCWs	They are harsh	26	15.4	33	15.6	0.24
	They have a negative attitude	6	3.6	16	7.6	
	They are welcoming	137	81.1	162	76.8	
Availability of HCWs	Yes	144	85.2	177	83.9	0.724
	No	25	14.8	34	16.1	

Source: Primary data

Table 9 above reports that health related characteristics such as receiving health education talks ($p=0.003$) during visits to health facility were significantly associated with immunization completion at bivariate level.

4.10 Multivariate analysis and other independent variables

Table 10: Multivariate analysis and other independent variables ($n=380$)

Variable	B	p-value	95% Confidence Interval for B	
			Lower	Upper
Age bracket of caretaker in years	0.08	0.068	0.006	0.175
Marital status	0.02	0.465	0.09	0.041
Child's age in months	0.1	0.726	-.645	.450
Sex of child	.269	.209	-.152	.690
Place of delivery	.161	.290	-.460	.138
Received health education on immunization	.025	.263	-.053	.192
Child experienced side effects following immunization	.023	.627	-.562	.931
Aware of what immunization is	.003	.928	-.076	.069
Aware of right age of starting immunization	.210	.032		
Aware of right age of completing immunization	.117	.043	-.230	-.003
Number of children	.012	.333	-.095	.279

Table 10 above shows that; the multivariate analysis revealed that independent predictors of immunization completion included: individual awareness of the time of starting ($p=0.032$) and ending immunization ($p=0.043$).

CHAPTER FIVE: DISCUSSION OF FINDINGS

5.0 Introduction

In this section, discussions of the study findings are presented. This is followed with correlation of findings from similar studies and in relation to the objectives of the study. The level of immunisation completion among children below two years was assessed among a sample of 380 participants.

5.1 Level of completion of the immunization schedule

A significantly low 169 (44.5%) level of completion of immunization was reported. We scored immunization completion for each participant based on the criteria of World Health Organization. Low immunization coverage in this area could be multifactorial; it could be associated with individual and health system related factors as discussed in the subsections to follow. DPT-3 Coverage in our study was 264 (69.5%) which is lower as compared to the global estimated DTP-3 coverage of 86% reported in 2014 in the WHO African Region and 96% reported in the Western Pacific Region (CDC, 2015). This is an alarming sign that needs more efforts in the study setting with regards to immunization campaigns.

Regarding other doses of vaccines which are used as indicators of immunization completion, 45.8% and 100% had completed the doses of polio and BCG respectively. The fact that all respondents reported that they had got the BCG dose could be attributed to the fact that BCG is given at birth before discharge from the health facility and routine immunization coverage. In fact, Gomba district was reported to have good access to immunization services. The poor immunization utilization that is reflected in poor completion rates of other vaccines such as polio, DPT, PCV and Measles could be attributed to poor utilization in the area. This has been reported elsewhere, MOH, Uganda reported that Gomba district has got good access yet poor utilization of immunization services was registered (Ministry of health Uganda, 2012).

This is a positive intervention that has contributed to higher BCG coverage globally. The estimates of BCG coverage in our study are higher than the global estimates of 91%, however those of polio 3 and measles are by far lower than the estimated global coverage of polio 3, and Measles of 86%, and 85%, respectively (CDC, 2015).

On the other hand, the overall immunization completion rate in our study (44.5%) and the individual vaccine completion rates that is: Polio 3 (45.8%), DPT 3 (69.5%), BCG (100%) and Measles (73.2%) in our study are higher than those reported in similar studies in Sub Saharan Africa, for instance, the overall immunization completion in Ethiopia was 24.3 % and specific vaccination coverage for DPT-3, Polio-3, Measles and BCG were 36.5 %, 44.3 %, 55.7 % and 66.3 %, respectively (Lakew, Bekele and Biadgilign, 2015). This may be attributed to the vigorous mass immunizations by the government of Uganda through the Ministry of Health to ensure that all children get immunized before their first birthday.

5.2 Socio-demographic characteristics of mother and child influencing completion of the immunization schedule of children aged below 2 years

Socio-demographic factors including; age of the care taker, marital status, age of the child, sex of the child, place of delivery of current child, and number of children were statistically associated with completion of immunisation while a high level of education, occupation, number of ANC visits attended were not statistically associated with immunisation completion at bivariate level of analysis. However socio-demographic characteristics were not significant independent predictors of immunisation completion.

5.2.1 Age of the caretaker

Age of the care taker could be attributed to awareness and experience of immunization and child upbringing. Experiences of children who have benefited or who have been affected by diseases as a result of vaccinating them is expected to increase with age while lack of enough knowledge about the importance of childhood vaccination could cut across age but expected to be more among younger parents/guardians.

Age of the care taker was significantly associated with completion of the immunisation schedule (p-value=0.003). This may be attributed to the fact that older care takers have received prior information regarding immunization when they took their other children for immunization as compared to younger care takers. Similarities have been reported elsewhere, for instance: studies in Ethiopia (Negussie et al., (2016) Lakew, Bekele and Biadgilign, 2015) and Italy, reported that full immunization status among children varied significantly and increased with increasing age; Anello et al., (2017). To the contrary, a study in Kenya young age of mothers was associated with high immunization coverage as compared with the older mother (Kamau and Esami 2001).

5.2.2 Level of education

Highest level of education completed in this study was not a significant predictor of immunization completion both at univariate and bivariate analysis. However, knowledge on immunizable diseases and importance of immunization is expected to increase with increasing education. At bivariate level, there was a significant difference in the ratios of immunization completion in different education levels completed. Immunization completion rates were no significantly higher in more educated classes (Secondary and post-secondary). This was due to the fact that there were significantly more participants with no formal education and those that had only completed primary level of education. Findings of our study with regards to education level and immunization completion are contrary to those reported in other studies in Cameroon (Russo et al., (2015), China (Hu, et al., (2016; Wu, Li and Zhou (2016);, Senegal (Salam et al., (2017) and Nigeria (Okoroa et al., (2015) that showed high completion of immunization among mothers with adequate levels of education. These authors opined that mothers were familiar with immunization from the health education talks they attained due to their high education status and because they could easily read and understand the information displayed in immunization centers, it enabled them to know when to come back for next immunization schedule.

5.2.3 Employment status

Occupation was not a significant predictor of immunization completion in this study. Occupation is positively correlated with keeping immunization appointments and resources for immunization logistics (Funmilayo, 2015). It has been reported elsewhere that mothers from a higher wealth quantile were highly more likely to have their children fully immunized unlike those born from mothers with low incomes and lower wealth index (Lakew, et al., (2015); Bbaale, (2013).

5.2.4 Child's age and birth order

Child's age and birth order had significant correlation with immunization completion (p-value=0.006). This could be attributed to the fact that parents with the first child could lack enough knowledge on immunization and child up bringing compared to their counterparts with more experience of more than one child. However, the more the number of children, the more responsibilities and this could hinder keeping up with appointments. An increasing birth rank appears to be matched by a declining percentage of children who are up to date with vaccination. This may be a reflection of reducing family resources available to an individual

child the more children a family has. On the other hand, family spacing may re-inforce child vaccination in that the parents would have the time, energy and resources to take the child for vaccination. Similarly, the correlation of child's age and birth order has been reported elsewhere: in Uganda (Odiit and Amuge, 2003), China (Huang et al., (2015); Liang et al., (2009), Cameroon (Russo et al., (2015), in Ethiopia (Negussie et al., 2016) and Zimbabwe (Mukungwa, 2015) who found out that, children over 3 years had a higher immunization completion.

5.2.5 Place of birth

Place of birth was a significant correlate to immunization completion at bivariate analysis (p -value=0.002). Mothers who delivered from health facilities 290 (76.3%) reported a higher completion rate of immunisation compared to those who delivered from home. This is significant especially for those getting the first dose of BCG vaccines because this vaccine is given to the baby before they are discharged from the health facility. This therefore greatly reduces the chances of defaulting BCG as compared to other vaccines. Similar findings were reported by; Babirye et al., (2012) from Uganda, Chambongo et al.,(2016) from Tanzania, (Maina, Karanja and Kombich, (2013) from Kenya and Ethiopia Negussie et al., (2016) that untimely vaccination was more likely if the child was born outside a hospital. Indeed, most mothers who delivered from health facilities initiated vaccination in time and in general, vaccination schedule adherence tends to decrease with those who deliver outside health facilities, born at home. Children born at a health unit are significantly more likely to have had BCG scar than a child born at home (Odiit and Amuge, 2003).

5.2.6 Sex of child

Sex of the child was significantly associated with immunization completion in this study (p -value=0.001). Care takers with male children had significantly higher immunization completion rates as compared to their female counterparts despite the fact that there were more female babies. This could be attributed to gender inequalities that still prevail among the majority in of Uganda. Similarly, studies have shown that sex of the child found to predict the immunization status of the child in the societies in which gender inequality is prevalent. (Daniel et al., 2009; Kidane et al., 2006; Salam et al., 2017).). Indeed, based on a preliminary study, in Uganda, most societies still view a male baby superior to female babies. A review done in India from 1996- 2006 showed girls were found to have significantly lower immunization coverage than boys for BCG, DPT, and measles (Daniel et al., 2009).

5.2.7 Number of antenatal care visits

Number of antenatal care visits was not a significant predictor of immunization completion in our study. However, studies in Zimbabwe (Mukungwa, 2015) and in Cameroon (Russo et al., 2015) have revealed that mothers who attended more ANC visits were likely to complete immunization than children whose mothers did not receive ante-natal care.

5.3 Care giver related factors influencing completion of the immunization schedule of children below 2 years

5.3.1 Knowledge on immunization and vaccine preventable diseases

Immunization completion was correlated to knowledge of: what immunisation is, right age of completing and starting immunisation. Missing one or more of the scheduled immunisation schedules was also significantly correlated to immunisation completion. This is attributed to the fact that mothers who have low knowledge on childhood immunization are less expected to be more complaint to completion of their children immunization schedules as compared to mothers who have adequate knowledge as regards childhood immunization. Failure to know who should spearhead child immunization, where should it be done and when children should be vaccinated were directly related to missing of the immunization schedules and lack of completion as also reported in studies done in Nigeria and Uganda (Nankabirwa et al., 2010). In addition, Knowledge has been attributed to perceptions about importance of immunization. Zagminas et al. (2007) noted that having a positive opinion about vaccination, although 20-40% of respondents indicated insufficient knowledge on this issue. Some mothers could believe that the vaccines used to immunize the children were safe enough to be fully be relied upon in the prevention of childhood diseases.

5.4 Attitude on immunization

Regarding individual attitude towards immunization, completion of immunization was significantly correlated with experience of side effects following immunization. Mothers who have had children who have experienced un-desirable side effects from previous vaccines are more likely not to complete the immunization schedule as compared to their counterparts. This may also be attributed to failure of health care workers to first health educate these mother on the side effects of vaccines and how manage them.

Similar findings were reported in a study in Uganda by Kamanda, (2010) in Italy Russo et al., (2015) and in Ethiopia (Negussie et al.,(2016).

5.5 Health facility related factors influencing completion of the immunization schedule of children aged below 2 years

5.5.1 Distance from health facility

The Mother's distance to health center is a considerable barrier affecting adherence to EPI (Beaven Andrew A. Atienza, Bella Rea S. Abing, Van Lendl T. Calibugar, 2016). However, in our study, distance to the health facility was not a significant predictor of immunization completion despite the fact that distance to the nearest health facilities is one of the well-known factors associated with vaccination status (Xeuatvongsa et al., (2017). This could be attributed to statistical differences, more respondents who stayed in a distance of less than 5 km compared to their counterparts who lived more than 5 km from the nearest immunization centers. This finding is contrary to finding from Brazil (Victoria et al., (2011).

Mothers who were near health care facilities had more of their children immunized because mothers could easily visit health care facilities. Most of the mothers never incurred money for transport to the immunization centers since they used foot to move to the centers thus higher rates of immunization. Similar findings had early been reported by Logullo et al., (2008), Rup KP, et al., 2008) in India, in Zimbabwe (Mukungwa, (2015) where they attributed accessibility to the distance of the health center was less than 2km compared with those residing in remote inaccessible areas with a distance of more than 5km to the health center. Families nearer to the health facility are more likely to complete the immunization than those far from it.

5.5.2 Reported side effects of vaccines

Lack of medical knowledge within immunization for one's child, means that a caretaker does not know about standards of procedures, such as scheduled times of vaccination, or understands the medical basis of vaccines, for instance how it works and the possible side-effects. This can cause a caretaker not to undertake vaccination (Karlsson, 2012).

5.5.3 Attitude of health care workers

Perceived attitude of HCWS is a significant predictor of immunization utilization, were HCWs are perceived to be feared and ruthless would subject mothers to choose not to immunize them children. In our study, attitude of HCWS was not significantly associated with immunization completion. This finding is contrary to those reported in Uganda by Babirye et al., (2012); Rahji and Ndikom,(2013). Similar findings were reported by Oku et

al., (2017) who argued that opinions regarding the way in which health workers communicate with mothers hinders immunization coverage.

5.5.4 Availability of vaccines

In our study, availability of vaccines and accessibility of HCWS were not significant predictors of immunization completion. However, it has been reported elsewhere that unavailability of vaccines is one of the most common barriers to immunization adherence. This not only hinders mothers to comply with the present vaccination schedule but this may prevent mothers from coming back in the future as mothers may presume to be in the same predicament on the next appointment (Favin et al., 2012; WHO, 2012). With shortage of immunization supplies caretakers may miss vaccination on that day, which can consequently discourage future compliance.

5.5.5 Health education

Health workers not giving explanation or not providing clear information about the vaccine is the strongest impediments for vaccination compliance. In our study, this was indeed a significant correlate of immunization completion. This is similar to what has been reported elsewhere Beaven et al., (2016), in Nigeria and Rajasthan-India by Odusanya et al., (2008).

Health education is directly correlated with the content of information given to them during antenatal visits or post-natal discharge health talks. We therefore stress the need for an improvement in the quality of health information. In fact, Nisar, Mirza and Qadri, (2010) argued that having ever received information about childhood immunization was associated with completion of child immunization.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This chapter presents the conclusion drawn from the study findings and gives recommendations as to the way forward on how the problem of failure to complete the immunization schedule can be handled.

6.1 Conclusion

We sought to assess the extent of immunization completion and factors influencing completion of the immunization schedule of children below 2 years in Madu community Gomba district from March to May 2018. There was a low level of immunization completion of 44.5% in the study setting.

6.2 Recommendations

Increasing immunization completion could be facilitated by interventions aimed at creating more awareness among the masses on the importance of immunization, its long term benefits, safety of vaccines and engaging the community local leaders in immunization campaigns.

To policy makers, in addition to the good prevailing policy on immunization in Uganda, it is important to identify interventions to increase vaccine series completion specifically for polio, DPT-HiB-HeB and PCV that follow a series of doses.

To health care providers, reducing waiting times and timely receipt of doses according to schedules could increase the likelihood of completion of preceding doses and could act as an encouragement for mother to come for proceeding doses.

In addition, working on maternal/caregiver education, postnatal care follow-up could increase maternal/caregiver knowledge and perception about vaccines and child immunization. Such measures could mitigate defaults attributable to wrong perception about immunization to complete immunization.

6.3 Limitations

Some respondents feared to reveal their real opinion due to fear of the perceived negative effects of immunization.

There was recall bias where the respondents forgot some of the information relevant to the study.

6.4 Implication to nursing practice

Nurses have an important role in identifying children who are at risk for under immunization and educating mothers and guardians of children on the importance of completing the immunization schedule and the dangers of not completing immunization. Nurses also have a major role in recognizing factors that could help increase compliance rates.

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APPENDIX I
CONSENT TO PARTICIPATE IN RESEARCH

Dear respondent,

I am **Nakabuye Stella**, Reg. No: **2014-BNS-FT-011**, a student of International Health Sciences University pursuing a Bachelor’s Degree in Nursing. As a course requirement, a research study is supposed to be carried out to fulfill. You are invited to participate in the study under the title, **“Factors influencing completion of the immunization schedule of children below 2 years in Madu community Gomba district”**.

The information will be confidentially treated and strictly used for research purpose. Results from this study will enrich ground information about awareness among the patients about their rights during health care in order to add data for further research.

For the respondent

I am agreeing to participate in a research project with a purpose of **factors influencing completion of the immunization schedule of children below 2 years in Madu community Gomba district**. The information I will give will be the basis for measurement of my awareness in regard to patient participation in decision making during health care delivery.

I will be asked a series of interview questions and the investigator will record my answers and all remain confidential. The whole exercise will take about 15 minutes. My privacy and safety will be maintained. I can decline to answer any question or withdraw from the study any time. The interview is entirely voluntary and does not entail any foreseeable risks and direct benefits. All data will be maintained in a safe place by the researcher for one year and then shredded. Benefits of participation may include a contribution to scholarly research that identifies issues of patients’ participation in health care decision making.

Participation: My refusal to participate will involve no penalty or loss of benefits to which I am otherwise entitled. I will not be compensated for my participation. An offer is to answer all the questions about the study. I will be given a copy of the dated and signed consent form to keep.

Respondent..... Investigator

Date..... Date.....

Thank you so much for your time

APPENDIX II
QUESTIONNAIRE

Dear respondent, am **NAKABUYE STELLA**, Reg. No: **2014-BNS-FT-011**, a student of International Health Sciences University pursuing a Bachelor’s Degree in Nursing. As a course requirement, a research study is supposed to be carried out to fulfill. You are invited to participate in the study under the title, **“Factors influencing completion of the immunization schedule of children below 2 years in Madu community Gomba district”** is carried out. I dearly appeal for your participation to make it a success. The information provided will be treated with privacy and will strictly be used for academic research purposes by the researcher. Your time and cooperation will highly be appreciated.

Instruction: Tick the most appropriate option against the questions

SECTION A: Socio-demographic characteristics of respondents

1. Age bracket of respondent in years

- a) Less than 20 years []
- b) 20–29 years []
- c) 30–39 years []
- d) \geq 40 years []

2. What is your highest level of education?

- a) No formal education []
- b) Completed primary []
- c) Completed secondary []
- d) Post-secondary []

3. What is your marital Status?

- a) Married []
- b) Single []
- c) Divorced/widowed []
- d) Co-habiting []
- e) Other please specify.....

4. What is your occupation?

- a) Housewife []
- b) Civil servant []
- c) Self employed []
- d) Student []

e) Others.....

5. What is your child's age bracket in months?

- a) 12–15 []
- b) 16–19 []
- c) 20–23 []

6. What is the Sex of your child?

- a) Male []
- b) Female []

7. How many antenatal visits did you attend during pregnancy?

- a) Less than 4 visits []
- b) More than 4 visits []
- c) No visits []

8. Where did you deliver your child from?

- a) Health facility []
- b) Non-health facility (Home) []

9. What is your child's birth order?

- a) 1 []
- b) 2 []
- c) ≥ 3 []

10. Do you have your child's immunization card?

- a) Yes []
- b) No []

11. What is the reason for not carrying or having vaccination cards?

- a) It's at the nursery school or daycare center []
- b) Left it at home []
- c) Lost it. []
- d) I wasn't given one []
- e) Others specify.....

SECTION B: Care giver related factors influencing completion of the immunization schedule of children below 2 years Knowledge of care givers

12. What is immunization?

- a) It is the process by which an individual's immune system becomes fortified against an agent. []

- b) It is the protection of children against the vaccine preventable diseases []
- c) It is a way of providing protection against diseases caused by infection[]
- d) Immunization prevents children from sickness and diseases[]
- e) Do not Know []

13. Have you ever been given any Information or heard about vaccination?

- a) Yes []
- b) No []

If yes, what was the source of information regarding immunization?

- a) Health professionals[]
- b) Television[]
- c) Radio[]
- d) Friends []
- e) School[]

14. At what age should a child start immunization?

- a) As soon as a child is born []
- b) Three months after birth []
- c) Six months after birth []
- d) I don't know []

15. At what age does the infant complete the vaccination program?

- a) At 6 months []
- b) 9 months []
- c) 1 year []

16. Why do we immunize children?

- a) To protect children against preventable diseases []
- b) To keep children healthy []
- c) To protect children against malaria []
- d) I don't know []
- e) Others please specify.....

17. Do you know any four or more types of vaccine preventable diseases?

- a) Yes[]
- b) No[]

If yes, mention any six vaccine preventable diseases

.....

Attitude of care givers

18. Immunization protects children from getting infection?

- a) Strongly agree []
- b) Agree []
- c) Undecided []
- d) Disagree []
- e) Strongly disagree []

19. I can advise another person to take his/ her child for immunization

- a) Strongly agree []
- b) Agree []
- c) Undecided []
- d) Disagree []
- e) Strongly disagree []

20. It is necessary to complete the immunization schedule

- a) Strongly agree []
- b) Agree []
- c) Undecided []
- d) Disagree []
- e) Strongly disagree []

21. Do your local appointed leaders support the immunization programmes?

- a) Yes []
- b) No []

SECTION C: Health facility related factors influencing completion of the immunization schedule of children aged below 2 years

22. Are there immunization services at your nearest health facility?

- a) Yes []
- b) No []

If yes, have you at one time missed any immunization schedule?

- a) Yes []
- b) No []

23. What are some of the reasons that lead to missing out on that immunization schedule?

- a) Lack of time []
- b) Feel tired to go to the health center []

- c) Lack of transport fare []
- d) Late arrival []
- e) Lack of family or social support []

24. Has one of your children ever reacted (side effects) to vaccines?

- a) Yes []
- b) No []

If yes, what kind of side effect did your child experience?

25. Do you have trust in the vaccines used to immunize your child?

- a) Yes []
- b) No []

If no, why?.....

26. How far is the nearest health center/ hospital from your home?

- a) 5km or less []
- b) More than 5 km []

27. What is the means of transport to the health center when taking child for immunization?

- a) On foot []
- b) In vehicle []

28. Sometimes your child doesn't get immunized when you take them for immunization due to lack of drugs/vaccines. Have you ever experienced this?

- a) Yes []
- b) No []

29. Do you receive communication/ information (health education) from the health workers about subsequent immunization schedules?

- a) Yes []
- b) No []

30. Throughout your experience, what is you're the of health workers to care givers and patients?

- a) Health workers are harsh []
- b) They have a negative attitude []
- c) They are lazy []
- d) They are welcoming []

31. Whenever you take your child for immunization, are the health workers available?

a) Yes []

b) No []

32. What suggestions do you have to improve vaccination services?

a) There should be more vaccination personnel.[]

b) There should be less of a wait.[]

c) Hours and days when vaccinations are available should not be limited.[]

d) Vaccination cards should not be distributed.[]

e) The treatment of the public, and of the children being vaccinated, should be friend[lier.]

f) The health center should always have vaccines.[]

g) They should provide information on the vaccines that are being given, on the diseases that they prevent, and on the reactions that they produce.]

h) Other Specify:

SECTION D: Completion of the immunization schedule

33. How old is your youngest child?.....

34. Did you get your youngest child immunized?

a) Yes []

b) No []

If yes, how many doses did your youngest child get?

Polio.....

DPT/HIB/HEP.....

BCG.....

Measles.....

PCV.....

Which of the above did you not complete the required times?

a)b)

.....c).....

Why didn't you complete the schedule?

.....


Thank you for your time.

APPENDIX III

MAP OF GOMBA DISTRICT SHOWING LOCATION OF MADU COMMUNITY



KEY

 -Madu community

APPENDIX IV
INTRODUCTORY LETTER



making a difference in health care

Office of the Dean, School of Nursing

Kampala, 24th April 2018

THE CHAIRMAN
MADDU PARISH
GOMBA DISTRICT

Dear Sir/Madam,

RE: ASSISTANCE FOR RESEARCH

Greetings from International Health Sciences University.

This is to introduce to you **Nakabuye Stella** Reg. No. **2014-BNS-FT-011** 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 the award.

The topic of research is: **Factors Influencing Completion of the Immunization Schedule of Children Bellow 2 Years in Maddu Community, Gomba District.**

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

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

Sincerely Yours,

Ms. Agwang Agnes
Dean, School of Nursing Uganda

The International Health Sciences University
P.O. Box 7782 Kampala – Uganda
(+256) 0312 307400 email: aagwang@ihsu.ac.ug
web: www.ihsu.ac.ug

APPENDIX V
CORRESPONDENCE LETTER

LOCAL COUNCIL 1 CHAIRMAN
KAYUNGA VILLAGE,
MADDU PARISH, GOMBA DISTRICT

Date: 8TH/5/2018

THE DEAN
INTERNATIONAL HEALTH SCIENCE UNIVERSITY;
KAMPALA UGANDA.

RE: ACCEPTANCE OF YOUR MS. NAKABUYE STELLA TO CARRY OUT HER RESEARCH.

This serves to declare that I have received student nurse Nakabuye Stella Reg. No. 2014-BNS-FT-011 of the above University to carry out her research on **FACTORS INFLUENCING COMPLETION OF THE IMMUNISATION SCHEDULE OF CHILDREN BELOW 2 YEARS IN MADDU COMMUNITY, GOMBA DISTRICT.**

This will involve three villages, Kayunga, Kyamabaale and Kyamuyisa.

Yours faithfully



Kiwamuka Livingstone