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Determinants of Pentavalent Immunization Dropout Among Children Aged 12-23 Months In Amhara Sayint District, South Wollo, Amhara Region, North East Ethiopia, 2019

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BAHIR DAR UNIVERSITY, COLLEGE OF MEDICINE AND
HEALTH SCIENCES, SCHOOL OF PUBLIC HEALTH,
DEPARTMENT OF EPIDEMIOLOGY AND BIostatISTICS

DETERMINANTS OF PENTAVALENT IMMUNIZATION DROPOUT
AMONG CHILDREN AGED 12-23 MONTHS IN AMHARA SAYINT
DISTRICT, SOUTH WOLLO, AMHARA REGION, NORTH EAST
ETHIOPIA, 2019

BY

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Abstract

Background: Immunization is a lifesaving and cost-effective health intervention which reduces childhood morbidity and mortality. There are still 19.9 millions of children who are unprotected by immunization first one year life. Pentavalent Vaccine is composed of five different vaccines that protect against five major diseases: diphtheria, tetanus, pertussis (whooping cough), hepatitis B and Haemophilus influenza type b. According to the national survey 20% of child was pentavalent dropout in Ethiopia. However, Determinants of this immunization dropout had not studied by community based study.

Objective: To identify determinants of pentavalent immunization dropout among children aged 12-23 Months in Amhara Sayint district, North East Ethiopia November 2019.

Methods: A community-based unmatched case-control study was conducted in fourteen kebeles of Amhara Sayint District, North East Ethiopia from October 16 to November 10, 2019. A total of 533 mother-child pairs (178 cases and 355 controls) were selected by the stratified multistage sampling technique. Interviewer administered questionnaire employed to collect the data. Data entry was made with Epi-data version 3.1 and exported to SPSS statistical software version 20 for data analysis. A variable with a P-value of <0.25 in the binary logistic regression analysis was considered to be a candidate variable for multivariable logistic regression analysis.

Results: This study showed that mothers who had not PNC care service (AOR= 3.4,95% CI:2.03–5.67), more than 30 minutes traveling time to reach vaccination site (AOR= 2.1,95% CI:1.34–3.35), households not visited by health extension workers at least monthly (AOR= 2.7,95% CI:1.69–4.38), home delivery (AOR= 2.5,95% CI:1.50–4.06), Child had not vaccination cards (AOR= 2.4,95% CI:1.37-4.28), and knowledge on child immunization (AOR= 2.0,95% CI:1.13–3.50) were determinants of pentavalent immunization dropout.

Conclusion: According to this study showed that home delivery, had not postnatal care services, more than 30 minutes traveling time to reach vaccination site, households did not visited by Health extension workers, Child had not vaccination cards and poor maternal knowledge on child immunization were determinants of pentavalent immunization dropout.

Keywords: Drop-out; pentavalent immunization; Determinants; 12-23 months children; Amhara Sayint, Case-control study

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Abbreviations

ANC	Antenatal care
AOR	Adjusted odds ratio
CI	Confidence interval
COR	Crude odds ratio
DTP	Diphtheria, Tetanus, Pertussis
EDHS	Ethiopia demographic health survey
EPI	Expanded program on immunization
Hib	Haemophilus influenza type B
Penta	Pentavalent vaccine
PNC	Post natal care
WHO	World health organization
VPDs	Vaccine preventable disease

1. Introduction

1.1 Background

Immunization is one of the most cost-effective of all child survival health intervention. Each year, about 85 per cent of the world's children receive vaccines that protect them against diphtheria, tetanus and pertussis. These vaccines save about 2.5 million lives[1]. Despite this Successes, In developing countries almost 20% of all children born every year did not get the complete immunizations in the first year of life[2].

Ethiopia set objective to reach 90% national coverage and 80% in every district with all vaccines and reduce pentavalent dropout rate to 2% nationally and less than 5% in all districts by 2020[4]. In 2016, Ethiopia demographic health survey showed that there were a 20 % dropout rate at the national level from the first to the third dose of pentavalent vaccine[5]. Those dropout children were at risk for morbidity, mortality and outbreaks of vaccine preventable diseases.

Pentavalent Vaccine is composed of five different vaccines that protect against five major diseases: diphtheria, tetanus, pertussis (whooping cough), hepatitis B and Haemophilus influenza type b (DTP-hepB-Hib). The Immunization drop-out is defined as the percentage of children that started a vaccine, but didn't complete it. Drop-out rates are indicative of service utilization and immunization performances [3]. Child is to be fully immunized they got three dose of pentavalent vaccine according to the schuele. Therefore, immunization to be effective in reducing of vaccine-preventable diseases and deaths, every child should be fully immunized by the age of one year.

1.2 Statement of the Problem

Significant progress in vaccination coverage has been made worldwide since launched immunization programs. Despite this success, more than 3 million people die from vaccine-preventable diseases each year globally[1]. Globally, Hib kills more than 370,000 children under five every year. But by providing full dose pentavalent vaccine prevent over a third of pneumonia cases and 90% of meningitis case caused by Hib[6]. Every year in Africa of more than 500,000 death in under five children by Vaccine-preventable disease[7].

Despite the increased report of vaccination coverage in the globe year to year, the immunization progress has stalled over the current decade, 71 countries have not yet to achieve the global vaccine action plan target of 90 per cent or greater coverage of DTP3[8]. DTP1,DTP3 coverage and DTP dropout were 91%,86% and 5% respectively reported by WHO in all regions. In African region dropout proportions for diphtheria , tetanus toxoids and pertussis containing vaccine was 11% [9]. An estimated 19.9 million children under the age of one globally did not receive DTP3 vaccine first one year life. Around 60% of these children live in 10 countries. Ethiopia shared top ten countries with the greatest number of children who did not received DTP3 vaccination[10].In 2016 Ethiopian demographic survey penta immunization dropout was 20%[11].

There were studies conducted on immunization dropout few countries [12-19]. Most of these studies conducted earlier on dropout of immunization were evaluation surveys and Crossectional studies which were evaluated specific intervention and assessed prevalence drop out but There were no study on the determinants of pentavalent immunization dropout independently. As to the best knowledge of the investigators no studies had done on determinants of immunization dropout in the study area. Therefore, this study can minimize this research gap.

The immunization dropout data was readily available at sub-district level and kebeles level in the study area. There were repeatedly faced vaccine preventable outbreaks for the last two years. Despite there were available of data on immunization drop out, there were no study on the determinants of immunization dropout. The objective of this study is to identify determinants with pentavalent immunization drop out among children aged 12-23 Months and generate data that was used for better planning and strengthening routine immunization services.

1.3 Significance of the study

The finding of this study will be used for improving the immunization service by making intervention accordingly identified determinants. The results can be used by health providers and woreda administrators to improve the coverage of full immunization in children, and additionally by policy makers and program managers to formulate appropriate strategies to decrease the immunization dropout. This averts child morbidity and mortality by vaccine preventable disease in the study area. It provides evidence based information for stakeholders support the EPI programs to alleviate those problems. Finally, it may be used as a reference for further works on similar topics.

2. Literature review

2.1 Determinants for pentavalent immunization dropout

Various factors may influence utilization of vaccination according to the recommended schedule among children. The main determinants are socio-demographic factors and health care services factor. Consequently, a number of studies have been carried out across the world to find out the significant factors that hinder or increase the likelihood vaccination according the immunization schedule.

2.1.1 Socio-demographic factors

Low educational level of mothers or child minders has a negative impact on child immunization status[12].The study conducted in narok north district, Kenya show that maternal level of education was found to be significantly related to the immunization dropout status of the child [13]. Children of mothers/caregivers, who had no formal education, more likely to have failed to receive multi-dose vaccines as compared with children of mothers who had completed a higher level of education [18, 20]. However, another study shows that maternal level of education was not significantly related to the immunization dropout status of the child [15, 21].

Children from married families were less likely to drop out from immunization schedule compared to unmarried [15]. Other study show that marital status is significant associated with immunization incomplection[21].But there were no significant associated marital status and immunization dropout in another study [12, 13]. Children from non-Christian families were more likely to drop out from immunization schedule compared to Christians[15].

Child's sex was significantly associated with complete immunization[22, 23]. Males were more likely to be completely vaccinated. However, in another study on immunizations dropout were not associated with sex of child[12, 13].

Maternal age was not significantly associated child defaulted from immunization programmes [18, 21, 24, 25].In contrast, A Case control study conducted in Arbegona district show that the risk of defaulting their child's vaccine series is higher in younger mothers than older mothers[26].

Child birth order was significant factor in completing immunization on recommended schedule and being fifth and above in the family had a higher likelihood to default than being born first [20, 26, 27]. However, study in East Gojjam zone and Tigray region are not associated in child birth order for completion of immunization [24, 25].

A case-control study in Amanuel district, East Gojjam zone showed that parity was the predictors of incomplete childhood vaccination [24]. The type of pregnancy was factor which predicts complete immunization. The odds of planned pregnancy were more likely for complete immunization than unplanned pregnancy [23].

Media programs play a great role in delivering information for large population at a time on the child immunization with simple and understandable ways and persuade mothers to develop positive behaviour towards need and completing full doses of child immunization. Study showed exposure to media had association with defaulting of child immunization [27]. The studies show that lack of knowledge on the immunizable diseases was found to significantly influence the dropout status of a child. Children of mothers lack of knowledge on vaccine-preventable diseases and the importance of immunization makes many children drop out before completion of the immunization schedule [13, 28].

Different studies also tried to identify maternal/caregiver's reasons for either vaccination dropout or no vaccination. Specific reasons mentioned by mothers/caretakers were, mother fear of adverse reaction, Forgetting the appointment; being unaware of the need to return for subsequent doses; child sick, and caregiver sick on the appointment day were contribute to the dropout status of children [13, 28, 29].

2.1.2 Health services related factors

Poor immunization performance and a failure to deliver services due to transport problems, or inadequate supplies can lead to not vaccinate timely [2]. Different studies show that distances from home to the vaccination site is significantly factor for child vaccination [13, 14, 23, 25, 27]. Another study was conducted to identify the factors predicting third doses of diphtheria-tetanus-pertussis (DTP3) completion among children who have received DTP1 significant associated travel time to reach EPI centre [30].

Vaccine supply are the reasons for defaulting from immunization program [13, 27, 31]. The study in Hadiya zone showed that the health workers failed to make home visits and

cancelled immunization sessions were the reasons for defaulting from immunization program[31].

Maternal health service utilization like antenatal care, PNC service and place of delivery were factors associated with vaccination status of children. Home delivery of the child more likely incomplete the recommended schedule of immunization than health institution delivery[28]. Different studies showed that place of delivery were associated factor for childhood vaccination[12, 20, 24, 32].

ANC follow up during pregnancy were the significant factor for complete immunization [23, 24, 32, 33]. Mothers who had ANC follow-ups during pregnancy were more likely to vaccinate their children when compared to mothers who did not have ANC follow- up during pregnancy. Studies showed that children born from mothers who had PNC follow-up were significantly associated with defaulting children from immunization [25, 32].

3. Conceptual framework

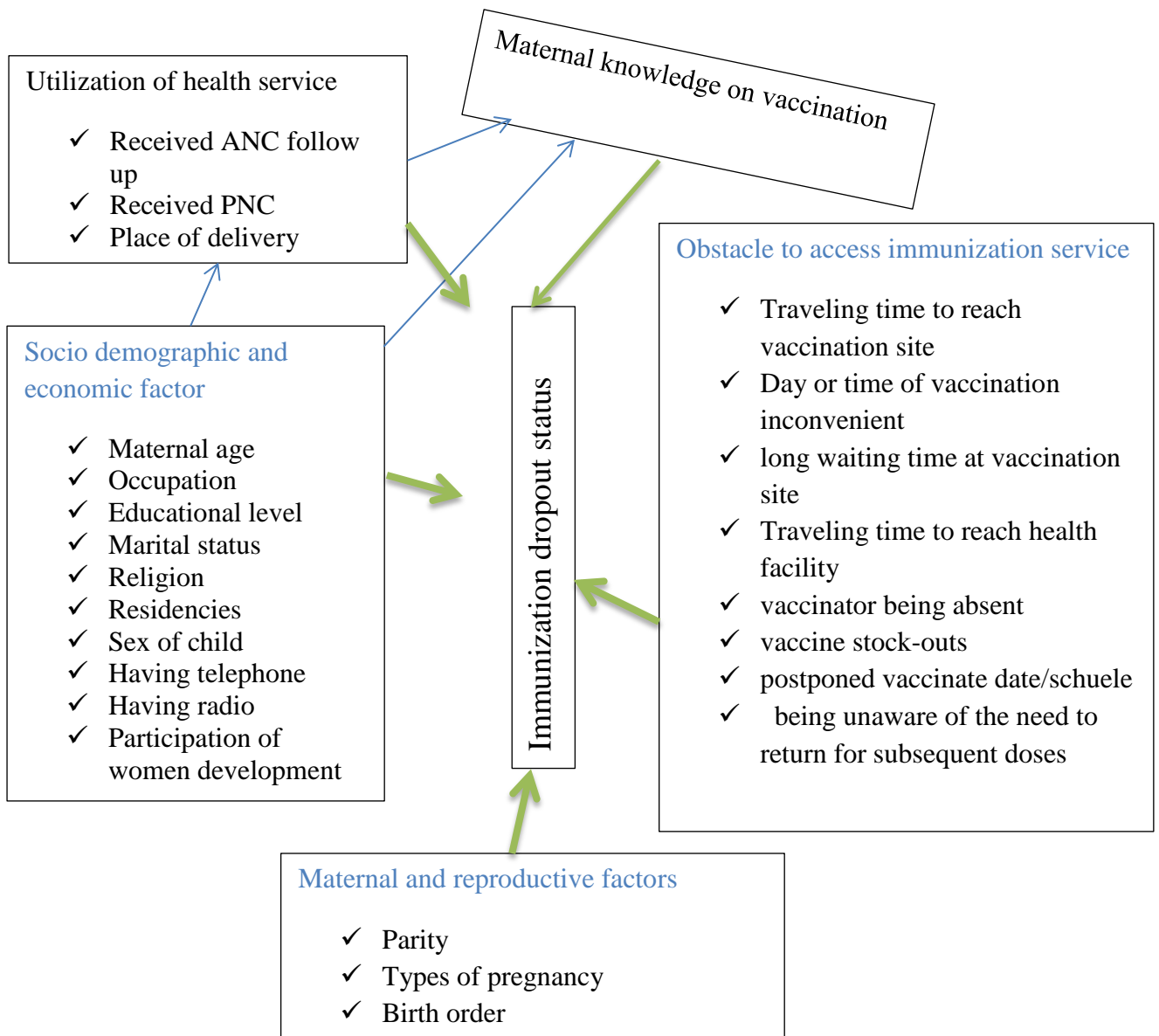


Figure 1: conceptual frame work for determinants of immunization dropout adapted from Reviewed literatures

2. Objective

To identify determinants of pentavalent immunization dropout among Children Aged 12-23 Months in Amhara Sayint district, south wollo zone, Amhara region, Northeast Ethiopia, 2019

3. Methods

3.1 Study area

The study was conducted in Amhara sayint district, south wollo zone, Amhara region. Amhara Sayint district is located 380 Kilo meter East of Bahir Dar and 590 KM North West of Addis Ababa. The district administratively divided in to 35 kebeles with an estimated population size of 171,926 and 25,085 under-five children and 5354 children under one year based on 2007 Census projection.

There are 165 health professionals and 80 health extension workers. District has 1 district hospital, 8 health centers and 35 health posts supported by outreach vaccination sites which routinely provide immunization services.

3.2 Study design and period: A community based unmatched case-control study design was conducted from October 16 to November 10, 2019

3.3 Source population and study population.

The source population was all children 12-23 months age who had received at least first doses of pentavalent vaccine in the Amhara sayint district during study period.

The study population was all children aged 12-23 months residing in 14 randomly selected kebeles during study period.

3.5 Inclusion criteria

Children aged 12-23 month who had received at least one doses of pentavalent vaccine during study periods.

Case: Children aged 12 - 23 months who received at least one dose of the pentavalent vaccine but not received third dose of pentavalent vaccine during study periods.

Control: children aged 12 -23 months who received first and third doses of pentavalent vaccine during study periods.

3.6 Exclusion criteria

Mothers/ caregivers who were had serious illness and unable to communicate during data collection period.

3.7 Sample size determination

We compute the sample size by considering the determinants variables from previous case-control studies conducted in Ethiopia[25, 26]. Among controls, 2.3% of lack knowledge of immunization benefits, while among cases it was 12.9%. Using the assumptions of 80% power, 95% confidence interval, 10% non-response rate and a case-to control ratio of 1:2, design effect =2, the total sample size is 533 (178 cases and 355 controls).

Table 1: Sample size calculation by using determinants variables from previous study.

Significant predictors	References	CI %	power	case	% of exposure		OR	Sample size		
			%	control	case	control		case	control	total
Lack of knowledge immunization benefit	[26]	95	80	1:2	12.9	2.3	5.51	178	355	533
Maternal age ≤19	[26]	95	80	1:2	44.5	8.8	9.54	30	62	92
Time take ≥30 min EPI centre	[25]	95	80	1:2	36.7	12.2	3.56	98	197	295
Lack of PNC services	[25]	95	80	1:2	85.6	45.6	5.2	46	93	139
Household did not visited by HEW	[25]	95	80	1:2	71.1	36.7	2.68	109	219	328

3.8 Sampling procedures

Initially, the district was stratified into urban and rural kebeles. Out of the total 34 rural kebeles, 13 were selected by simple random sampling by using lottery methods, and the only urban Kebele was included. Sample was selected from thirteen rural and one urban kebeles. All eligible cases and controls in the 14 selected kebeles were listed from the health posts and health center EPI registration books. A house-to-house survey was conducted to confirm the eligibility of the children identified from the registration books. After the survey, a sampling frame was prepared for each kebeles.

The final sample size of cases and controls from each Kebele was allocated based on the probability proportional size to the number of children aged 12–23 months. Participants were mothers /care givers who had children aged 12–23 months in the kebeles selected by the stratified multistage random sampling method. Cases and controls selected based on proportional size to each Kebele. A total of 533 samples (178 cases and 355 controls) were selected from the sample frame by using simple random sampling technique using computer methods open spss software. The same sampling procedures were selecting the sample size for cases and controls show in the figure 2.

Table 2: Proportional allocation of cases and controls in Amhara Sayint District, South Wollo Amhara Region, Ethiopia, 2019

Kebeles	Number of Samples population	
	cases	controls
AJBAR	7	31
BEJA	11	22
DEFERGIE	9	24
DUTS	13	24
ENDOTS	13	25
EWA	9	24
HURMO	10	16
MELESSANKA	13	29
SH/D	13	26
SHHOT	16	34
TEGOBALEL	23	26
WEGIDE	15	30
WUKIR	13	20
YEGODA	13	24
Total	178	355

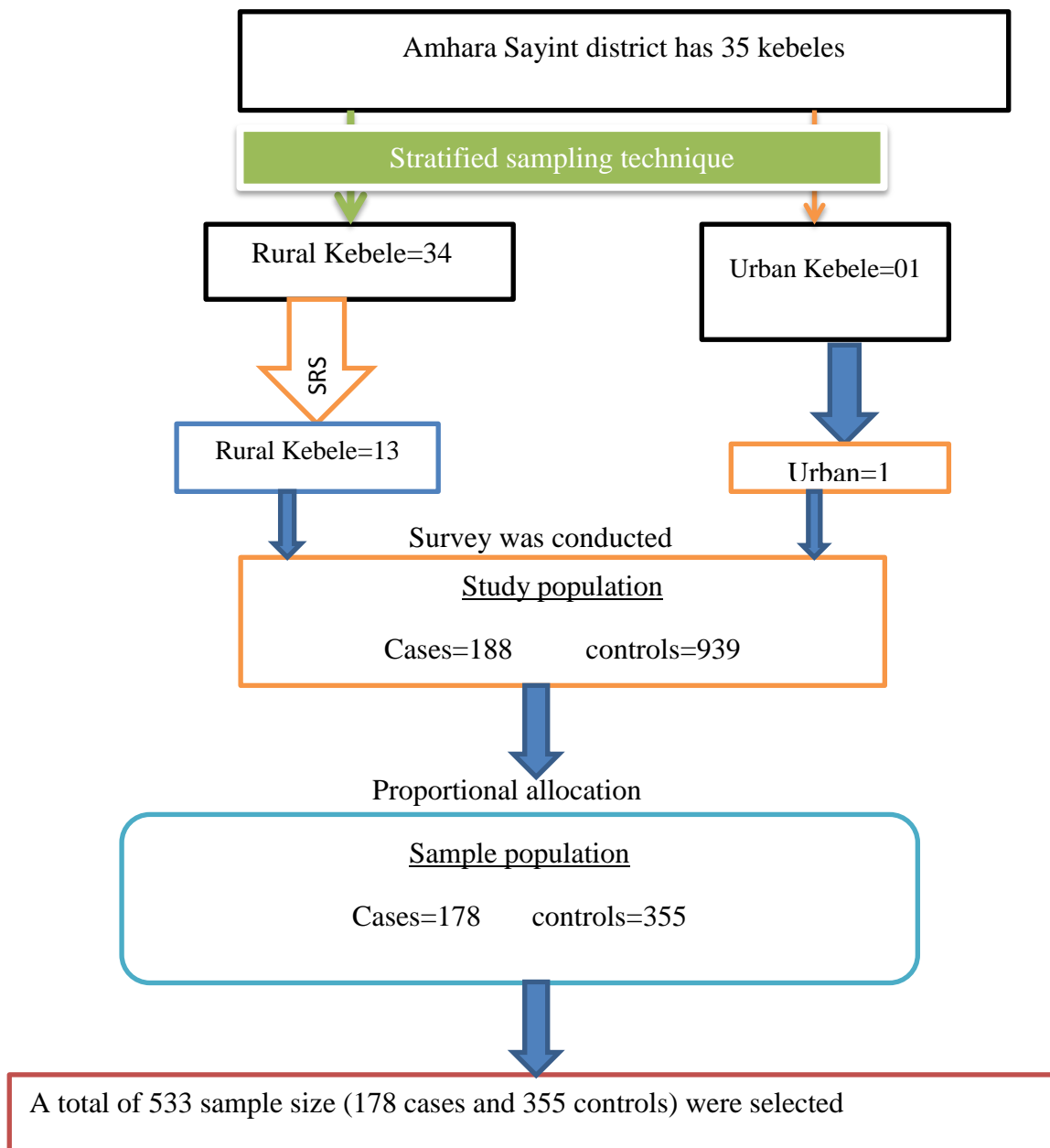


Figure 2: Sampling procedure of study kebeles in Amhara Sayint District, South Wollo Amhara Region, Ethiopia, 2019

3.9 Study variables

3.9.1 Dependent variable

Pentavalent immunization dropout (yes/No)

3.9.2 Independent variables

Age of mother	women development groups
ANC follow up	Receiving PNC
Occupation	Place of birth
Educational level	Child sick
Marital status	Traveling time to reach vaccination site
Religion	Day or time of vaccination inconvenient
Residencies	long waiting time at vaccination site
Sex of child	Traveling time to reach health facility
Birth order	vaccinator being absent
Having telephone	vaccine stock-outs
Having radio	Parity
Maternal knowledge on vaccination	postponed vaccinate date/schuele
Types of pregnancy	Forgotten appointment day
Being sick mothers	

3.10 Operational definitions

Women's Development Groups (WDGs) is an organized movement of the Community through participatory learning and action meetings weekly bases for improving maternal and child health. WDGs consist of groups of 25-30 women residing in a neighbourhood in a one-to five networks with one leader and five members.

Maternal participation in the Women Development Groups (WDGs) was assessed using six WDGs participation related questions. Those mothers who were members of a WDG and participated in three or more activities were considered to have satisfactory participation and mothers who were not members of a WDG or participated in less than three activities were considered as having poor participation.

Maternal/Caregiver knowledge on immunization was assessed using seven immunization knowledge related questions. Correct answers were given a score of one and incorrect

answers were scored zero. Those answer four or more from seven questions were considered to have a satisfactory knowledge and those who answered less than four were considered to have poor knowledge.

Pentavalent immunization dropout is the proportion of children that received at least first doses pentavalent vaccine but had failed to receive third dose of pentavalent vaccine.

3.11 Data collection instrument and procedure

Pretested and structured questioners were adapted to collect data related to the objectives of the study. The questionnaire was translated from English to Amharic (Local Language) and then back translated into English to maintain its consistency. Amharic questionnaire were used to collect the data using interview method .Data was collected from all eligible children mothers/care givers by data collectors.

3.12 Data quality assurances

Twenty eight data collectors (health extension workers) and 4 supervisors (senior health officer) were trained for two days. Data quality was controlled through conducting a pre-tested questionnaire. Data collectors were paired during data collection to ensure quality of the data. The data collection was supervised by supervisors and principal investigator on daily basis.

3.13 Data processing and analysis

Data completeness was checked and entered to Epi-data version 3.1 and then export to SPSS version 20 for statistical analysis. Once the data was cleaned, descriptive statistics were computed to describe the data. The outcome variable (immunization dropout status) was dichotomized as cases and controls. Binary and multivariable logistic regression analyses were used to identify determinants of immunization dropout. The Hosmer-Lemeshow goodness of fit test was checked ($P > 0.178$). A variable with a P-value of < 0.25 in the binary logistic regression analysis was considered to be a candidate variable for multivariable logistic regression analysis. Backward stepwise regression method was also used to control confounding effect between independent variables. A P-value of < 0.05 was considered to state statistically significant association between independent variables and outcome variable. Crude and adjusted odds ratios with 95% confidence interval were computed to observe the association between the outcome variable and independent variables. Finally, results were summarized and presented by using tables, Frequencies and figures.

3.14 Protecting human subjects (Ethical consideration)

The study protocol is reviewed and ethical clearance was obtained from institutional review board of Bahir dar university ethical committee. Formal letter for permission was obtained from APHI. The purpose of the study was explained for the participants. Informed verbal consents were obtained from the parents/care givers of the child before the interview.

4. Results

4.1 Socio-demographic characteristics of mothers/caregivers

A total of 533 mothers participated in the study, for a response rate of 100%. Of these, 142 (79.8%) of cases, and 301 (84.8%) of controls were between the ages of 20–34 years. One hundred fifty four (86.5%) cases and 325 (91.5%) controls were orthodox and one hundred sixty six (93.3%) of cases and 317 (89.3%) of controls were housewives.

Table 3: Socio-demographic characteristics of mothers/caregivers in the Amhara Sayint District, Amhara Region, Northern Ethiopia, 2019

Variables	category	Cases	Controls
		No (%)	No (%)
Age of the mother (years)	<20	0	6(1.7)
	20-34	142(79.8)	301(84.8)
	≥35	36(20.2)	48(13.5)
Marital status	Married	171(96.1)	344(96.9)
	Not union	7(3.9)	11(3.1)
Place of residence	Urban	17(10.6)	37(10.4)
	Rural	161(89.4)	318(89.6)
Maternal occupation	House wife	166(93.3)	317(89.3)
	Not house wife	12(6.7)	38(10.7)
Maternal educational status	Unable to read and write	115(64.6)	122(34.4)
	Able to read and write	36(20.2)	123(34.6)
	primary	22(12.4)	71(20)
	secondary	3(1.7)	18(5.1)
	More than secondary	2(1.1)	21(5.9)
Fathers educational status	Unable to read and write	96(53.9)	82(23.1)
	Able to read and write	51(28.7)	145(40.8)
	primary	23(12.9)	83(23.4)
	secondary	4(2.2)	12(3.4)
	More than secondary	4(2.2)	29(8.2)
Do you have radio in your home	Yes	12(6.7)	61(17.2)
	No	166(93.3)	294(82.8)
Do you have mobile in your home	Yes	83(46.6)	154(43.4)
	No	95(53.4)	201(56.6)
Religion of mothers	orthodox	154(86.5)	325(91.5)
	Muslim	24(13.5)	30(8.5)
Family size	<5	71(39.9)	179(50.4)
	≥5	107(60.1)	176(49.6)
Did you have a vaccination card your child	yes	110(61.8)	321(90.4)
	No	68(38.2)	34(9.6)
Sex of child	Male	90(50.6)	174(49.0)
	Female	88(49.4)	181(51.0)

4.2 Maternal /caregiver participation in women’s development group (WDG)

Seventy five (42.1%) mothers of cases and 211 (59.4%) mothers of controls reported being members of a WDG, but only 42 (30.9%) mothers of cases and 142 (40%) mothers of controls had satisfactory participation in WDGs according to the study criteria. Among the WDG members, 50 (28.1%) mothers of cases and 172 (48.5%) mothers of controls had a plan regarding child immunization. forty one (23%) mothers of cases and 136 (48.7%) mothers of controls attended one-to- five meetings regularly. Forty three (24.2%) mothers of cases and 135 (38%) mothers of controls had their own plan about child immunization. Thirty five (19.7%) mothers of cases and 132 (37.2%) mothers of controls had a performance measurement in the WDGs. Thirty four (19.1%) mothers of cases and 128 (36.1%) mothers of controls had list of under one year’s child in the WDGs.

Table 4: Maternal /caregiver participation in women’s development group (WDG) in the Amhara Sayint District, Amhara Region, Northern Ethiopia, 2019

Variables	Category	Cases	Controls
		No (%)	No (%)
Members of WDG	Yes	75(42.1)	211(59.4)
	No	103(57.9)	144(40.6)
plan for child immunization in WDGs	Yes	50(28.1)	172(48.5)
	No	128(71.9)	183(51.5)
weekly meeting in your one-to-five networks	Yes	41(23.0)	136(38.3)
	No	137(77.0)	219(61.7)
Do you have own plan regarding child immunization	Yes	43(24.2)	135(38.0)
	No	135(75.8)	220(62.0)
Measured your monthly performance in your WDGs	Yes	35(19.7)	132(37.2)
	No	143(80.3)	223(62.8)
list of under one year’s child in your WDGs	Yes	34(19.1)	128(36.1)
	No	144(80.9)	227(63.9)

4.3 Knowledge of mothers /caregivers on/about child immunization

Of the total respondents, 170 mothers of cases (95.5%) and 354 controls (99.7%) had heard about childhood vaccination and 148 mothers of cases (83.1%) and 354 controls (99.7%) had heard about vaccine preventable diseases, and 148 mothers of the cases (83.1%) and 352 controls (99.2%) could know vaccines prevent a disease.

Table 5: Knowledge of mothers /caregivers about child immunization in the Amhara Sayint District, Amhara Region, Northern Ethiopia, 2019

Variables	Category	Cases	Controls
		No (%)	No (%)
Have you heard about vaccination	Yes	170(95.5)	354(99.7)
	No	8(4.5)	1(0.3)
Heard about vaccine preventable disease	Yes	148(83.1)	354(99.7)
	No	30(16.9)	1(0.3)
Know vaccines prevent a disease	Yes	148(83.1)	352(99.2)
	No	30(16.9)	3(0.8)
Know importance of vaccinating a child	Yes	144(80.9)	304(85.6)
	No	34(19.1)	51(14.4)
Do vaccines have side effects	Yes	77(43.3)	246(69.3)
	No	101(56.7)	109(30.7)
know the vaccination program/schedule/ of your locality	Yes	96(53.9)	274(77.2)
	No	82(46.1)	81(22.8)
Know number of sessions completely vaccination your child	Yes	54(30.3)	184(51.8)
	No	124(69.7)	171(48.2)

4.4 Health service & reproductive related characteristics of mothers /caregivers

This study shows that 96 cases (53.9%) and 207 controls (58.3%) lived within two hour's distance from a health facility. One hundred twenty three mothers of cases (69.1%) and 337 controls (94.9%) had Antenatal Care (ANC) follow up. One hundred five (59%) mothers of cases and 285 controls (80.3%) delivered in a health institutions. Sixty seven mothers of cases (37.6%) and 296 controls (83.4%) had postnatal care (PNC).

Table 6: Health care access and utilization of mothers/caregivers in the Amhara Sayint District, Amhara Region, Northern Ethiopia, 2019

Variable	Category	Cases	Controls
		No (%)	No (%)
Birth order	1	24(13.5)	75(21.1)
	2-3	88(49.4)	178(50.1)
	4-5	46(25.8)	89(25.1)
	≥6	20(11.2)	13(3.7)
Parity	1	28(15.7)	83(23.4)
	2	49(27.5)	100(28.2)
	>2	101(56.7)	172(48.5)
Visited by HEW at least monthly	yes	40(22.5)	213(60)
	No	138(77.5)	142(40)
Mode of transport	On foot	173(97.2)	332(93.5)
	Not on foot	5(2.8)	23(6.5)
Distance from health facility in hours	≤2	96(53.9)	207(58.3)
	>2	82(46.1)	148(41.7)
Distance to reach vaccination site in minute	≤30	54(30.3)	189(53.2)
	>30	124(69.7)	166(46.8)
Types of pregnancy	planned	177(99.4)	353(99.4)
	unplanned	1(0.6)	2(0.6)
Have ANC follow up at least one	yes	123(69.1)	337(94.9)
	No	55(30.9)	18(5.1)
Place of delivery	Health institution	105(59)	285(80.3)
	Home	73(41)	70(5.1)
Have PNC service	Yes	67(37.6)	296(83.4)
	No	111(62.4)	59(16.6)

4.5 Reasons for pentavalent immunization dropout

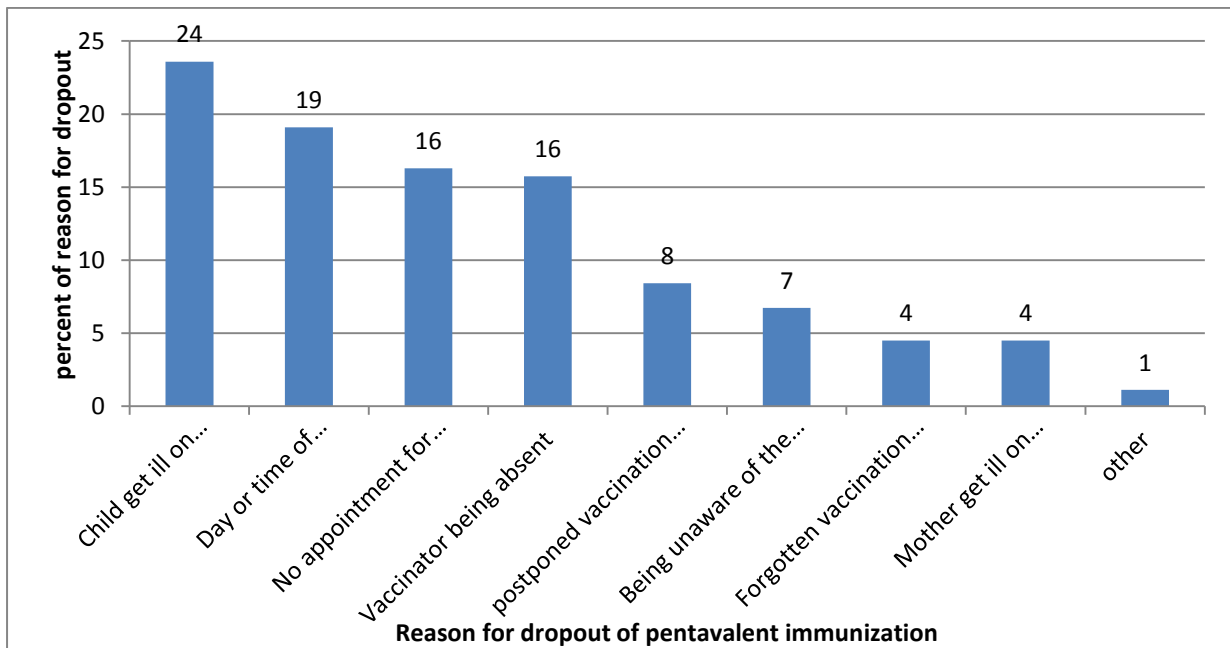


Figure 3: Reason of mothers had not taken third dose of penta vaccine their child in the Amhara Sayint District, Amhara Region, Northern Ethiopia, 2019

The main reasons for pentavalent immunization dropout were child sickness at the apportionment date time, reported in 42 of 178 cases (24%), mother's failure to vaccinated their child due to day or time of vaccination date inconvenient reported in 34 of 178 cases (19%) .So the major reasons for dropout were child sick during the date of vaccination, day or time of vaccination inconvenient and not appointment the next visit respectively

4.6 Multivariable logistic regressions analysis for determinants of pentavalent immunization dropout

Maternal knowledge on child immunization, ANC visit, Having radio, family size in home, birth order, Possession of vaccination card, participation on WDGs, parity, household visited by HEWs, traveling time to reach vaccination site, PNC service, place of delivery were a variable with a P-value of ≤ 0.2 in the binary logistic regression analysis was considered to be a candidate variable for multivariable logistic regression analysis. PNC services, place of deliveries, traveling time to reach vaccination site, had not vaccination card, maternal knowledge on child immunization and household visited by HEWs at least monthly were determinants of pentavalent immunization dropout after adjusting for all the other variables.

Children born from mothers who had no get PNC services had three times more likely the odds of dropout than children born from mothers who had got PNC services (AOR=3.4, 95%CI: 2.03-5.67). Children born from mothers who took more than 30 minutes to reach vaccination site had two more likely dropout than mothers who took less than 30 minutes to reach vaccination site (AOR=2.1, 95%CI: 1.34-3.35). Mothers who did not visit their households by HEWs at least monthly had three times more likely dropout their child than mothers who had visit their household by HEWs at least monthly (AOR= 2.7,95%CI: 1.69-4.38). Child who had not having vaccination card had two times more likely dropout than child who had vaccination cards (AOR=2.4, 95%CI: 1.37-4.28). Child who born from mother who had home deliveries had two times more likely than child who born from mothers who had health institution deliveries (AOR=2.5, 95%CI: 1.50-4.06). Child born from mothers who had poor knowledge on child immunization had two times more likely dropout than mother who had good knowledge on child immunization (AOR=2.0,95%CI:1.13-3.50).

Table 7: Multivariable logistic regressions analysis for determinants of pentavalent immunization dropout in Amhara Sayint District, Amhara Region, Northern Ethiopia, 2019

Variable	Category	Cases	Controls	COR	AOR
		No (%)	No (%)	CI (95%)	CI (95%)
Do you have radio in your home	yes	12(6.7)	61(17.2)	1	1
	No	166(93.3)	294(82.8)	2.9(1.50-5.48)	1.7(0.80-3.60)
Family size	<5	71(39.9)	179(50.4)	1	1
	≥5	107(60.1)	176(49.6)	1.5(1.03-2.14)	1.0(0.56-1.82)
Did you have a vaccination card your child	yes	110(61.8)	321(90.4)	1	1
	No	68(38.2)	34(9.6)	5.8(3.66-9.29)	2.4(1.37-4.28)*
Birth order	≥6	20(11.2)	13(3.7)	4.8(2.08-11.09)	3.2(0.71-14.72)
	4-5	46(25.8)	89(25.1)	1.6(0.90-2.89)	1.3(0.35-2.62)
	2-3	88(49.4)	178(50.1)	1.5(0.91-2.61)	1.9(0.37-6.21)
	1	24(13.5)	75(21.1)	1	1
Parity	>2	101(56.7)	172(48.5)	1.7(1.06-2.85)	1.1(0.34-3.38)
	2	49(27.5)	100(28.2)	1.4(0.84-2.51)	0.9(0.29-2.84)
	1	28(15.7)	83(23.4)	1	1
HHs Visited by HEWs at least monthly	yes	40(22.5)	213(60)	1	1
	No	138(77.5)	142(40)	5.2(3.43-7.81)	2.7(1.69-4.38)*
Traveling time to reach vaccination site in minute	≤30	54(30.3)	189(53.2)	1	1
	>30	124(69.7)	166(46.8)	2.6(1.78-3.83)	2.1(1.34-3.35)*
Have ANC follow up at least one	yes	123(69.1)	337(94.9)	1	1
	No	55(30.9)	18(5.1)	8.4(4.73-14.82)	1.3(0.59-2.66)
Place of delivery	H/ institution	105(59)	285(80.3)	1	1
	Home	73(41)	70(5.1)	5.9(3.94-8.71)	2.5(1.50-4.06)*
Have PNC service	Yes	67(37.6)	296(83.4)	1	1
	No	111(62.4)	59(16.6)	3.7(2.53-5.51)	3.4(2.03-5.67)*
Maternal knowledge on immunization	satisfactory	130(73)	309(87)	1	1
	poor	48(27)	46(13)	2.5(1.58-3.90)	2.0(1.13-3.50)*
Participating WDG	satisfactory	42(30.9)	142(40)	1	1
	poor	136(59.1)	213(60)	2.2(1.44-3.24)	1.1(0.65-1.86)

*P-value<0.05

5. Discussion

The study was conducted to identify the determinants pentavalent immunization dropout among children 12-23 months. This study showed that traveling time to reach vaccination sites, had not got PNC services, household did not visit by HEWs at least monthly, had not vaccination card, home delivery and poor maternal knowledge on child immunization were determinants of pentavalent immunization dropout after adjusting for all the other variables.

Time taken to reach the vaccination site was determinant for pentavalent immunization dropout. Children born from mothers who were more than thirty minutes to reach vaccination site had two times more likely dropout than mother who had to reach less than or equal to thirty minutes for vaccination sites. This study support with study conducted in Debre Markos Town, Amhara Region [23]. But A case-control study conducted in southern Ethiopia Tigray region found that distance from vaccination site was not a significant determinant for defaulting from immunization [25]. This might be spending more time to reach vaccination site is discouragement for childhood immunizations and drop from the vaccination especial requires for multiple visits to complete the series of doses. This implies that should add new sites as needed to address the issue of long travel times.

Having vaccination cards were a determinant of pentavalent immunization dropout. Children who had not vaccination cards had two times more likely pentavalent immunization dropout than children who had vaccination cards. This is similar to a study conducted in Ghana[22]. The probable reason that there are no records, mothers could easily forget and not recall the second and third appointment date. This implies that assess each kebeles children got vaccination cards and validate each kebeles during supervision.

Mother who delivered at home had 2.5 times more likely pentavalent immunization dropout their child compared with the children born institutional delivery. The finding of this study is support those with other studies immunization dropout in Parakou[12], incomplete immunization conducted in Amanuel district, East Gojam zone Amhara region[23] and in Nepal[28]. This could be explained by the fact that women, after home delivery, rarely have access to information and education about immunized their child. This implies that strengthened antenatal care counselling to improving institutional delivery that adequate education on immunization benefit and schuele.

Mothers who had no postnatal care visits had three times more likely pentavalent immunization dropout compared to mothers who had postnatal care visits. This study is supported by measles vaccination dropout rate and factors associated with measles vaccination dropout in children 12-23 months age in anlemo district, Hadiya zone, southern Ethiopia [34] . This might be due to the fact that mothers who had no postnatal care visits missed the chance of communicating with health care providers to hear about the benefits of vaccination and the relevance of completing immunization. Additional reasons in this study due to home delivery and health extension workers has not household visit a regular program. This implies that strengthened full packages maternal and child health to reduce immunization dropout.

Mothers who have poor knowledge about childhood immunization were two times more likely to pentavalent immunization dropout than those of mothers with satisfactory knowledge on immunization. This finding is supported by study conducted in Arbegona district, southern Ethiopia [26] and in Tigray Region, Ethiopia[25].Study on reasons of DPT 1-3 vaccine dropout in Kabarole district, western Uganda[35]. This could be explained by the fact that women, poor knowledge about childhood immunization, might be reluctant in following health professionals/ HEW's instructions concerning vaccine schedules so that they missing appointment dates. This implies that regular household visit and community mobilization to vaccinate their child.

In this study, children born from mothers whose households were not visited monthly by HEW was 2.7 times more likely pentavalent immunization dropout compared to children born from mothers who had monthly visited by HEW their household. This supports findings from Tigray region[25].This implies that household visits at least monthly are an important for health education about child immunization benefits ,schuele and to trace defaulter children in the household.

6. Limitation

Though the study did its best to indicate the determinant of immunization dropout, it is not free from limitations. Variables like vaccine supply and health service provider factors was not addressed in this study which focused on understanding why children immunization dropout from the programs.

7. Conclusion

In this study showed that home delivery, had not postnatal care services, more than 30 minutes traveling time to reach vaccination site, households did not visited by health extension workers, had not vaccination card and poor maternal knowledge on child immunization were found to be the determinants of pentavalent immunization dropout.

8. Recommendations

- ✓ In order to improve maternal knowledge on immunization, EPI managers need to plan and implement a well-coordinated health education campaign that aims at reaching the parents at the community and household levels
- ✓ Program managers and district health offices should investigate the distribution of vaccination sites and add new sites as needed to address the issue of long travel times
- ✓ Health extension workers should visit households at least once per month to provide skill based health education and trace defaulters
- ✓ Home based PNC follow-up should be strengthened to improve access for those mothers unable to attend the health facility based PNC follow-up and delivered home
- ✓ District health workers should be strengthened conferences for pregnant women to prevent home delivery and increasing mothers' awareness on childhood vaccination

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10. Appendixes

Appendix 1: Request to Conduct Research

Dear participant

This letter serves to request for your permission to conduct research on pentavalent immunization drop out status among children, Amhara saint, South wollo zone, Amhara region, Northeast Ethiopia. I am presently Master's degree of Public Health student at Bahir Dar University. The research is done to fulfil the requirement of Master's Degree of Field Epidemiology.

Appendix 2: Consent Form

Title of the study: determinants of pentavalent immunization drop out status among children, Amhara saint, South wollo zone, Amhara region, Northeast Ethiopia

Dear participant, my Name is -----, professionally I am _____ and I am a working in ----- I am collecting data for research project intended to determinate of pentavalent immunization drop out status among children, Amhara saint, South wollo zone, Amhara region, Northeast Ethiopia. Now, I want to ask you, your willingness to participate on this research by your full interest. The research is important for you and for general community for improving immunization services in your district by intervene accordingly the identifying factor for immunization dropout. And also, I would like to tell you as you have full rights to participate or not participate on this study and as you have right to stop participation at any time on the process of study duration. Additionally, all information you will give us are confidential and used only for this study.

Dear participant, thank you for your cooperation in advance; and now I will read to you or you can read this written consent form; and you will sign for me as you agreed to participate in this study with your full well, after you understand the objective of the study, all procedures will be taken, and your benefits and rights.

Appendix 3: QUESTIONNAIRES

District _____ Kebele _____ House no. /Gote _____ Serial no _____

Name of Investigator _____ Sign. _____

Name of Supervisor _____ sign _____

Name of data collector _____ sign _____

Code/ID of respondent _____

Date of Data collection. ____//____//____

Part 1: Maternal and child socio-demographic factors

S.No	Questions	Response	Code	Skip to
101	Child birth date	_____dd/mm/yyyy		
102	Age of pental vaccine start	_____weeks		
103	Sex of children	Female Male	0 1	
104	Who is the immediate caretaker of the child?	Mother Father Sister Relatives Other (specify)	1 2 3 4 5	
105	Age of the mother	_____years		
106	Marital Status of the mother	Single Married Widowed Divorced Other (specify)	1 2 3 4 5	
107	Religion of mothers	Protestant Orthodox Muslim Catholic Other (specify)	1 2 3 4 5	
108	Family size in home			
109	Number of children's older siblings			
110	Residence	Urban Rural	1 2	
111	Maternal educational status	Unable to read and write read and write grade 1-8 grade 9-12 college/university	1 2 3 4 5	
112	Fathers educational status	Unable to read and write read and write	1 2	

		grade 1-8	3	
		grade 9-12	4	
		college/university	5	
113	Do you have the following in your home?	Radio	1	
		Mobile	2	
		Television	3	
114	Occupational Status of mother	House wife	1	
		Daily labourer	2	
		Farmer	3	
		Merchant	4	
		Government Employee	5	
		Other (specify)	6	
15	Do you have a vaccination card your child?	Yes	1	
		No	0	

Part 2: Maternal participating in WDG Questions

S.No	Questions	Response	Code	Skip to
116	Are you a member of in women development group?	Yes	1	No Skip to 201
		No	0	
117	Do you have plan for child immunization in WDGs?	Yes	1	
		No	0	
118	Do you have a weekly meeting in your one-to-five networks?	Yes	1	
		No	0	
119	Do you have own plan regarding child immunization?	Yes	1	
		No	0	
120	Do you have measured your monthly performance in your WDGs?	Yes	1	
		No	0	
121	Do you have list of under one year's child in your WDGs?	Yes	1	
		No	0	

Part 3: Maternal /caregivers knowledge on immunization Questions

S.No	Questions	Response	Code	Skip to
201	Have you heard about vaccination?	Yes No	1 0	
202	Have you heard about vaccine preventable disease?	Yes No	1 0	
203	Vaccine is used to prevent a disease?	Yes No	1 0	
204	Immunization is important for Your a child	Yes No	1 0	
205	Do vaccines have side effects?	Yes No		If No, skip to206
206	If yes, what side effect do you know?	fever & pain swelling & irritation at the injection Needle stick injury Vaccine induced disease other specify	1 2 3 4 5	
207	Do you know the vaccination program/schedule/ of your locality?	Yes No	1 2	No, skip to 209
208	If yes, Date of the program?			
209	How many vaccination sessions are needed for a child to be completely vaccinated?			

Part 5: Maternal health related factors (Only for mothers)

S.No	Questions	Response	Code	Skip to
301	Have you attended antenatal care at least one during your last pregnancy?	Yes No	1 0	No, skip to 304
302	If yes, how many times did you attend?			
304	Where have you delivered your last baby?	Health institutions At home	1 0	
305	Have you received postnatal care service from health facilities during your last delivery?	Yes No	1 0	No, skip to 307
306	If yes Q305, how many times did you receive?			
307	Number of children ever born by the mother(parity)			
308	Types of pregnancy	Planned unplanned	1 0	

Part 6: Factors related to immunization service delivery

S.No	Questions	Response	Code	Skip to
401	Traveling time to reach health facility in hours			
402	Traveling time to reach vaccination site in minute			
403	What mode of transport you use to go to vaccination site?	1.By foot 2.By horse 3.By car		

404	Household visits by HEW at least monthly?	Yes	1	
		No	0	
405	Reasons given by mother/caregiver reason not vaccinated third dose of pentavalent? Circle each of the response given by respondents	Child get ill on appointment day	1	
		Being unaware of the need to return for subsequent doses	2	
		No appointment for subsequent doses	3	
		Forgotten vaccination appointments	4	
		Day or time of vaccination inconvenient	5	
		Long waiting time at vaccination site	6	
		Vaccinator being absent	7	
		Mother get ill on appointment day	8	
		Vaccine stock-outs	9	
		Postponed vaccinate date/schuele	10	
		Other(specify)	11	

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ውድ ተሳታፊዬ

ይህ ይህ ደብዳቤ በጸረ አምስት ክትባት አቅራቢ ሕፃናት ፣ በአማራ ሳይንት ፣ በደቡብ ወሎ ዞን ፣ በአማራ ክልል ፣ በሰሜን ምስራቅ ኢትዮጵያ ጥናት ለማካሄድ ፈቃድዎን ለመጠየቅ ያገለግላል ። በአሁኑ ሰዓት በባህር ዳር ዩኒቨርሲቲ የህብረተሰብ ጤና ተማሪ ነኝ ።

የታቀደው ጥናት በጨቅላ ሕፃናት የጸረ አምስት ክትባት አቅራቢ የሚወስን ምክናየቶች ላይ ነው ። ጥናቱ የተካሄደው በማስተር ፊልድ ኤፒዲሚዮሎጂ ለመመረቅ መሟላት ያለበት ጥናት ነው ።

የፍቃደኝነት ማረጋገጫ ቅጽ

የጥናቱ ርዕስ-በሕፃናት ፣ በአማራ ሳይንት ፣ በደቡብ ወሎ ዞን ፣ በአማራ ክልል ፣ በሰሜን ምስራቅ ኢትዮጵያ መካከል የፀረ አምስት ክትባት አቅራቢ የሚወስኑ ሁኔታን መለየት

የተከበሩ ተሳታፊ ፣ ስሜ -----ይባላል። ሙያዬ -----ሲሆን፤ የምስራቅ መሰሪያቤትም-----ውስጥ ነው። ወዳንቺ የመጣሁበት ዋናው በአማራ ሳይንት ፣ በደቡብ ወሎ ዞን ፣ በአማራ ክልል ፣ በሰሜን ምስራቅ ኢትዮጵያ ያሉ ህጻናት ክትባት አቅራቢ ወሳኝ የሆኑባቸው ችግሮች እነማን ናቸው በሚል ርእስ ለሚሰራው ጥናት ና ምርምር ካንቺ መረጃ ለመሰብሰብ አሁን በዚህ ምርምር ለመሳተፍ ፈቃደኝነትዎን በሙሉ ፍላጎትዎ ልጠይቅዎት እፈልጋለሁ ። በዚህ መሠረት የክትባት መቋረጥን ለመለየት በሚጠቅም ሁኔታ ጣልቃ በመግባት ምርምር ለእርስዎ እና ለጠቅላላው ማህበረሰብ አስፈላጊ ነው ። እንዲሁም ፣ በዚህ ጥናት ላይ ለመሳተፍ ወይም ላለመሳተፍ ሙሉ መብቶች እንዳሉት እንዲሁም በጥናቱ ሂደት ላይ በማንኛውም ጊዜ ተሳትፎዎን የማስቆም መብት እንዳሉት እነግርዎታለሁ ። በተጨማሪም ፣ የሚሰጡን ሁሉም መረጃዎች በሚስጥር የሚጠበቁ እና ለዚህ ጥናት ብቻ የሚያገለግሉ ናቸው ።

የተከበሩ ተሳታፊ ፣ ቀደም ሲል ላደረጉት ትብብር እናመሰግናለን ፣ እና አሁን አነባለሁ ወይም ይህንን የጽሑፍ ስምምነት ቅጽ ማንበብ ይችላሉ ፣ እናም የጥናቱን ዓላማ ከተረዱት በኋላ ሁሉም ሂደቶች ይወሰዳሉ እና ጥቅሞችዎ እና መብቶችዎ በዚህ ጥናት ውስጥ በሙሉ ለመሳተፍ ሲስማሙ ለእኔ ይንገሩኝ

ጥያቄዎች

ወረዳ _____ ቀበሌ _____ የቤት ቁጥር/ጎጥ _____ ተራ ቁጥር _____

ያጥኝው ስም _____ ፊርማ _____

ሱፐርቫይዘር ስም _____ ፊርማ _____

መረጃ ሰብሳቢው ስም _____ ፊርማ _____

መረጃ የሚሰጠው ሰው መለያ ቁጥር _____

የመረጃ መሰብሰቢያ ቀን __//__//__

ክፍል 1-ሶሻሎ-ግራፊያዊ መረጃ

ተ.ቁ	ጥያቄዎች	መልስ	ኮድ	ዝለልወደ
101	የልደት ቀን	_____ ቀን / ወር / ዓመት		
102	የመጀመሪያውን ጸረ አምስት ክትባት የወሰደበት እድሜ	_____ በሳምንት		
103	የህጻናት ጾታ	ሴት ወንድ	0 1	
104	የልጅ የቅርብ ጠባቂ ማን ነው?	እናት አባት እህት ዘመዶች ሌላ (ይግለጹ)	1 2 3 4 5	
105	የእናትዎ እድሜ	_____ አመት		
106	እናትዎ የጋብቻ ሁኔታ	የነጠላ ያገባች ባሏ የሞተ የተፋታች ሌላ (ይግለጹ)	1 2 3 4 5	
107	የእናቱዎ ሃይማኖት	ፕሮቴስታንት ኦርቶዶክስ	1 2 3 4	

		ሙስሊም ካቶሊክ ሌላ (ይግለጹ)	5	
108	በቤት ውስጥ የቤተሰብ ብዛት			
109	የህፃናቱ ታላቅ እህት እና ወንድም ቶች ብዛት			
110	የመኖሪያ ቦታ	ከተማ ገበር	1 2	
111	የእናትዋ የትምህርት ሁኔታ	ማንበብና መጻፍ እማችል ማንበብ እና መጻፍ የምችል 1 ኛ ደረጃ 9-12 ኛ ክፍል ኮሌጅ / የኒቨርሲቲ	1 2 3 4 5	
112	የአባትዬው ትምህርት ሁኔታ	ማንበብና መጻፍ እማይችል ማንበብ እና መጻፍ የሚችል 1 ኛ ደረጃ 9-12 ኛ ክፍል ኮሌጅ / የኒቨርሲቲ	1 2 3 4 5	
113	ቤትዎ ውስጥ የሚከተለው አለዎት?	ሬዲዮ ሞባይል ቴሌቪዥን	1 2 3	
114	የእናትዋ የስራ ሁኔታ	የቤት እመቤት የቀን ሰራተኛ ገበሬ ነጋዴ የመንግስት ሰራተኛ ሌላ (ይግለጹ)	1 2 3 4 5 6	
115	የክትባት ካርድ ልጅዎ አለው/ት?	አዎ አይደለም	1 0	

ክፍል 2: እናቶች በሴቶች አደረጃጀት ያላቸው ተሳትፎ መጠይቅ

ተ.ቁ	ጥያቄዎች	መልስ	ኮድ	ዝላልወደ
116	በሴቶች አደረጃጀት አባል ነሽ?	አዎ አይደለም	1 0	201
117	በልማት ቡድናችሁ ስለ ህጻናት ክትባት እቅድ አላችሁ?	አዎ የለንም	1 0	
118	በአንድ ለአምስታችሁ በሳምንት እየተገናኛችሁ ትወያያላችሁ?	አዎ አንወያይም	1 0	
119	ስለልጅሽ ክትባት የራስሽ/የግለሰብ እቅድ አለሽ?	አዎ የለኝም	1 0	
120	በልማት ቡድናችሁ የሰራችሁትን ሰራ በየወሩ እየተለካ ውጤታችሁን ታውቃላችሁ?	አዎ አናውቅም	1 0	
121	በልማት ቡድናችሁ ከአንድ አመት በታች ያሉ ሕጻናት ዝርዝር ይያዛሉ?	አዎ አይያዙም	1 0	

ክፍል 3 - እናቶች / ተንከባካቢዎች ስለ ክትባት ያላቸውን ዕውቀት ጥያቄዎች

ተ.ቁ	ጥያቄዎች	መልስ	ኮድ	ዝላልወደ
201	ስለክትባት ሰምተው ያውቃሉ?	አዎ አልሰማሁም	1 0	
202	በክትባት መከላከል ስልምንችላቸው በሽታዎች ሰምተው ያውቃሉ?	አዎ ሰመቸአላውቅም	1 0	
203	ክትባት ማስከተብ በሽታን ይከላከላል ?	አዎ አየከላከልም	1 0	
204	ልጅን የመከተብ አስፈላጊነት/ጥቅም ያውቃሉ?	አዎ አላውቅም	1 0	
205	ስለ ክትባት የጎን ዮሽ ያውቃሉ?	አዎ	1	

		አላውቅም	0	
206	ከላይ ያለው ጥያቄ አወ ከሆነ፣ የትኛውን የክትባት የጎን ዮሽ ነው የመታወቁው	ትኩሳት እና ህመም እተወጋበት ቦታ እብጠት እና ማንጣጣት መርፌ የሚወጋው ጉዳት ከክትባቱ ጋር የተያይዘው የሚመጡ በሽታ ሌላ ካለ ዘርዘር	1 2 3 4 5	
207	አካባቢው ያለውን የክትባት መርሃግብር ያውቃሉ?	አዎ አላቅም	1 0	
208	ከላይ ያለው ጥያቄ አወ ከሆነ መላሱ ፕሮግራሙ መቸ ነው			
209	አንድ ሕፃን ሙሉ በሙሉ ክትባት ወሰደ የምንለው ስንት ጊዜ ሲወስድ ነው			

ክፍል 4: የእናቶች ጤና አገልግሎት አጠቃቀም (ለእናቶች ብቻ)

ተ.ቁ	ጥያቄዎች	መልስ	ኮድ	ዝለል ወደ
301	በመጨረሻው እርጉዝዎ ወቅት የእርግዝና ቅድመ ክትትል አድረገዋል?	አዎ አላደረሱም	1 0	
302	መልስዎ አዎ ከሆነ ስንት ጊዜ አድረገዋል?			
304	የመጨረሻ ልጅዎን የት ወለዱ?	የጤና ተቋማት :: ቤት	1 0	
305	በመጨረሻው ወሊድ ከወለድ በኋላ የድህረ ወልድ የጤና አገልግሎት አግኝተዋል?	አዎ አላገኘሁም	1 0	
306	አዎ Q305 ከሆነ ለስንት ጊዜ አገኘሽ			
307	የወለድሻቸው ልጆች ብዛት ስንት ነው			
308	እርግዝናው ምን አይነት ነው	የታቀደ ያልታቀደ	1 0	

ክፍል 5-ከክትባት አገልግሎት አሰጣጥ ጋር የተዛመዱ ጉዳዮች

ተ.ቁ	ጥያቄዎች	መልስ	ኮድ	ዝላል ወደ
401	ከጤና ተቋም ያለው ርቀት በሰዓት			
402	የክትባት መስጫ ቦታ ርቀት በደቂቃ			
403	ወደ ክትባት ቦታ የሚሄዱት በምንድነው?	በግር በበቅሎ በመኪና	1 2 3	
404	በየወሩ ቤተወ በጤናኤክስቴንሽን የሰበኛል?	አወ አይሰበኛም	1 0	
405	በእናቲቱ / ተንከባካቢ የተሰጠው ምክንያት ለሦስተኛው ጸረ አምስት ክትባት አልተከተለም? እያንዳንዱን መልስ ክብ	በቀጠሮ ቀን ልጅ ታሞባት ለሚቀጥሉት ክትባት የመመለስ አስፈላጊነት አለመገንዘብ ለቀጣይ ክትባት ቀጠሮ አለመሰጠት የክትባት ቀጠሮ ቀን መርሳት የክትባት ቀን ወይም ሰዓት የማይመች መሆን በክትባት ቦታ ብዙ ሰአት ማስጠበቅ ከታቢው መቅረት የቀጠሮለት እናትዬዎ መታመም ክትባት ቦታ ማለቅ ቀጠሮው ወደ ሌላ ቀን መተላለፍ ሌላ (ይግለጹ)	1 2 3 4 5 6 7 8 9 10 11	

DECLARATION

I, hereby declare that all the work presented in this thesis is my own original work unless otherwise acknowledged. It has never been presented either in part or in full for publication or award of a degree in any university. I, therefore, present it for the award of Master degree in Public Health of Field epidemiology, from Bahir Dar University, Ethiopia.

It is now ready for submission to the department of Bahir Dar University (BDU) with our approval.

APPROVAL SHEET

This research report by Derebe Nigussie titled “determinants of Pentavalent Immunization Dropout among children aged 12-23 month in Amhara Sayint District” has been carried out under our advice and guide to prepare this thesis. It is now ready for submission to the department of Bahir Dar University (BDU) with our approval.

Advisors

Name: Mr. Keadnew Mulatu

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