

Research Article

# Dropout from Maternity Continuum of Care and Associated Factors Among Mothers Who Gave Birth After War in Adigrat Town, Tigray, Northern Ethiopia 2024

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## Abstract

**Background:** Maternity continuum of care is the continuity of maternal health care services given to mothers during antenatal period, child birth and post natal period. It is one of the strategic programs meant to lower the death rates of mothers, newborns, and children. In spite of this, a large number of moms discontinue their participation in maternal continuum care. Dropout from the maternity continuum of care is prevalent public health issue in underdeveloped nations, such as Ethiopia. **Methods:** Community based quantitative cross-sectional study was carried out among 357 mothers who gave birth in the 12 months in Adigrat town. Systematic sampling method was used to obtain study participants. Data was collected using pretested, semi- structured and face to face interviewer administered questioner. Bivariable and multivariable logistic regression model was fitted. Variables having p-value less than 0.2 in bivariable analysis was entered to multivariable logistic regression model. In multivariable logistic regression adjusted odds ratio with 95% confidence interval was used to determine strength and direction of the association between dependent and independent variables. **Results:** The overall magnitude of drop out from the maternity continuum of care was 237 (66.4%) [95%CI (61.3-70.9)], 60.6% drop out from ANC visit, 5.6% drop out from skill birth attendant and 58.9% drop out from PNC. Mothers never heard on maternal health care service (AOR=4.179 (1.107, 15.783)), service out of health facility (AOR =5.136 (1.988, 13.267)) noabortionhistory (AOR=1.424 (1.113, 12.133)), unplannedpregnancy (AOR=5.478 (1.902, 15.777)), less than 4 ANC visit (AOR= 5.583 (2.598, 11.997)) and mothers attitude (AOR=15.049 (2.489, 32.997)) were statically significant factors associated with drop out from maternity continuum of care. **Conclusion and discussion:** This study showed that magnitude of drop out from maternity continuum of care was high as compared to WHO recommendations. As a result concerned stakeholders and policy makers should initiate more than four ANC visit, create awareness on harmful traditional practice, bad pregnancy history, support mothers to use family planning to prevent unplanned pregnancy, and work on attitude change of the community.

## Keywords

Drop Out, Maternity Continuum of Care, Associated Factors, After War, Adigrat Town

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Received: 20 August 2024; Accepted: 14 October 2024; Published: 12 November 2024



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## 1. Introduction

Maternity continuum of care is defined as the continuity of maternal health care services provided to mothers during antenatal period (ANC), child birth and postnatal period (PNC) [1]. It is one of the strategic plans that has been developed to reduce half million of maternal deaths, 4 million neonatal deaths, and 6 million child deaths in one year and to improve maternal and neonatal wellbeing. This integrated services that address the entire continuum from the antepartum to the postnatal period are important for gains in maternal and child survival and to reduce complications for both the mother and her neonate [2, 3]. Despite of this advantage of many mothers they dropped out from maternity continuum of care. Maternity continuum of care should focus on quality of care because it is important not only to mothers but also their child [1]. Dropout of from maternity Continuum of care is considered as among women's who received at least one ANC visit but did not receive skilled delivery assistants, and from those who got skilled birth attendants but did not receive at least one postnatal care within six weeks postpartum period in addition to the first 24 hours after institutional delivery [4, 5].

According to World Health Organization (WHO) 2015 estimation worldwide approximately 303,000 maternal deaths are occur during labor, delivery and immediate postpartum period and majority of the death occurred in developing country, it accounts around 66% in Sub-Saharan Africa and 22% in Southern Asia [6, 7]. The most common causes of maternal mortality that occurred during pregnancy and child birth complications are avoidable by providing proper care during pregnancy, delivery and postpartum period [8] however, many mothers in majority countries do not got ANC, skilled delivery care and PNC and also they dropped out from maternity continuum of care [9]. Globally data showed that around 80% of maternal deaths could be prevented if women had access to essential maternity and basic health-care services during their pregnancy, child birth and postnatal period [10]. In South Asia and Sub-Saharan Africa the major drop-out more than 50% occurs early in the continuum of care between the first ANC visit and four ANC visits and more between pregnancy and delivery than between delivery and the postnatal period since having four ANC visits and receiving better quality of ANC affected women's subsequent use of Skilled birth attendant (SBA) [5, 8]. Drop out in maternity continuum of care is widespread in low resource setting country including Ethiopia mostly postpartum period is affected [11]. Compared to antenatal care and skilled attendance at birth, postnatal care has been largely neglected in safe motherhood programs. Postnatal care, especially within the first 48 hours after birth, is critical to the management of postpartum hemorrhage, an important cause of maternal deaths in developing countries since, more than 60 percent of maternal deaths occur in developing countries are happened during the first six weeks after delivery. In addition, postna-

tal care provides a chance to improve the adoption of healthy behaviors for mother and child [2, 11-13]. Only 47% of women had their first ANC visit in the first trimester in South Asia, and this proportion was even lower in Sub-Saharan Africa which is 24% [8].

In Ethiopia, the most common maternal health care service they received were ANC visit according mini Ethiopian demographic health survey (EDHS) of 2019 (74%) of woman receive at least one ANC visit by SBA during their pregnancy time and 43% women were receive four and above ANC but, the utilizations of professional assisted delivery care and PNC is low which is 48% and 34% respectively [14]. This indicate that there is drop out in maternity continuum of care and this may lead to poor maternal and child health.

Different studies showed that there are many factors that hindered the rate of maternity continuum of care like low or lack of formal education, poverty and healthcare access problems (distance to facility, have not exposure to media, unplanned pregnancy, having <4 ANC follow up, Sociodemographic factors and difficulty with getting money for treatment [4, 8, 11, 15].

Most literatures carried out in the glove and even in Ethiopia were utilization of maternity continuum of care, any of the three components of maternity continuum of care (antenatal, delivery and postnatal care) and their result shows both utilization and its dropout separately in the three components. Therefore, this study will aims to provide clear information on prevalence of dropout from maternity continuum of care and associated factors among mothers who gave birth in the last 12 months in Adigrat town and also there is scarcity of information on drop out maternity continuum of care and associated factors in Ethiopia, particularly in the study area.

## 2. Justifications of the Study

According to mini EDHS 2019 report, out of all women aged 15-49 years who had a live birth in the 5 years before the survey, 74% received at least one (ANC) and 48% had skilled delivery assistance, among women age 15-49 giving birth in the 2 years before the survey, 34% had a postnatal checkup [14]. This indicates around 26% of those who received antenatal care mothers were dropped out before delivery, and almost 14% of those who received skilled delivery assistance dropped out before postnatal care. This drop out in continuity of care is one contributing factor for poor maternal, neonatal and child health outcomes.

Limited studies have been conducted on the prevalence of drop out from maternity continuum of care and its associated factor in the study area, even in major part of Ethiopia. Maternity continuum of care is strategic plan to reduce maternal and neonatal mortality therefore, identifying magnitude of dropout of continuum care will be important for government

and health managers to suggest interventions in improving maternal and neonatal health.

This study will also provide greater input to the government and program managers for proper implementation and evaluation of their contribution for the achievement of Sustainable Development Goals (SDGs) in which the third SDG aimed for improving the maternal, newborn and child health as primary concern [16].

Finally the finding of this study will be used as a benchmark for further researchers and stake holders to conduct intervention study in the study area as well as in the country.

### 3. Methods

#### 3.1. Study Design and Period

Community based quantitative cross-sectional study was conducted from March 30-May 30/2024.

#### 3.2. Study Area

This study was conducted in Adigrat town Tigray Ethiopia. Adigrat town is one of the zonal towns found in Eastern Tigray zone. It is located around 900 Km North of Addis Ababa, capital city of Ethiopia and 108 Km from Mekele, the capital city of Tigray Regional state. It has six kebeles (smallest administrative unit in Ethiopia), one general hospital, two health centers, two high schools and 4 elementary schools. According to 2007 national census conducted by the central statistical agency of Ethiopia (CSA), the town has a total population of 57,588; of those 26,010 are men and 31,578 women. The majority of the population Orthodox Christianity followers, with 94.01% while 3.02% of the populations were Catholics followers, and 2.68% were Muslim.

#### 3.3. Population

##### 3.3.1. Source Population

All mothers who gave birth in the last 12 months in Adigrat town.

##### 3.3.2. Study Population

All mothers who gave birth in the last 12 months in Adigrat town in the selected kebeles.

##### 3.3.3. Inclusion and Exclusion Criteria

###### (i). Inclusion Criteria

All mothers who gave birth in the last 12 months in Adigrat town who resides for 6 months prior the study and above in the town.

Mothers who had at least one antenatal care (ANC) visit during her pregnancy.

###### (ii). Exclusion Criteria

Women who eligible but, they are serious ill and unable to communicate effectively during data collection period will be excluded from the study.

#### 3.4. Sample Size Estimation

The sample size was determined using single population proportion by assuming mothers who had at least one ANC visit drop out from maternity continuum of care 69.1%, from study conducted in DebreBrhane town [17], with a 95% confidence level and 5% marginal error and 10% non-response rate. Based on these assumptions, the total sample size was calculated using the following formula:

$$n = \frac{z\alpha/2^2 p(1-p)}{d^2} = \frac{1.96^2 0.5(1-0.5)}{0.05^2} = 328$$

Where n = required sample size, Z = critical value for normal distribution at 95% confidence level (1.96) P = prevalence of drop out from maternity continuum care d = 0.05 (5% margin of error), by considering 10% non-response rate of = 33 and, the minimum adequate sample size was found 361.

#### 3.5. Sampling Procedure

Systematic sampling technique was used to obtain study participants. Adigrat town has 6 kebeles by lottery method three kebeles were selected. From each selected kebles we were take mothers who gave birth in the last 12 months by systematic method and had at least one ANC visit during her last pregnancy as a sample. The health extension workers were responsible for identifying households who gave birth in the last 12 months. We will be abstracted the lists of women's who are eligible from the log book of health extension workers. Households having two mothers who gave birth in the last 12 months one mother was selected by lottery method.

#### 3.6. Variables of the Study

##### 3.6.1. Dependent Variable

Drop out from maternity continuum of care

##### 3.6.2. Independent Variables

###### (i). Socio-demographic Related Variables

1. Age
2. Religion
3. Ethnicity
4. Educational status
5. Marital statuses
6. Occupation
7. Husband age

8. Husband occupation
9. Husbands educational statuses
10. Household average income

#### (ii). Socio Cultural Related Variables

1. Mothers attitude towards continuum of care
2. Exposure to media
3. Getting permission from work

#### (iii). Obstetric /Reproductive Health Related Variables

1. Number of pregnancy
2. Number of children
3. Was the pregnancy was wanted/planned

#### (iv). Maternity Care Service Related Variables

1. The time when she start ANC
2. Number of ANC
3. The place of delivery
4. PNC visit

#### (v). Health Care Service Related Variables

1. Distance to health facility
2. Health facility type (public/privet)

### 3.7. Operational Definition

1. Maternity continuum of care; The health care services that a woman receives during pregnancy, childbirth, and the immediate postnatal period [4, 18].
2. Drop out from maternity continuum of care: In this study dropout from maternity continuum of care is considered as among women's who received at least one ANC visit but, did not receive skilled delivery assistants and from those who got skilled birth attendants, did not receive at least one PNC visit within the first 6 week postnatal period in addition to the first 24 hr after institutional delivery [4, 5, 15].
3. Antenatal care; is care in which a woman receives health care service at least one visit from health care providers during her pregnancy.
4. Delivery care; Child birth managed by skilled birth attendants.
5. Skilled birth attendants; An accredited health professional such as a midwife, doctor or nurse who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns.
6. Postnatal care; the care which is given to women and newborn for the first six weeks after childbirth.

### 3.8. Data Collection Tools and Procedures

The questionnaire was developed after reviewing relevant literatures and modified accordingly. The data was collected using pretested, semi structured and an interviewer- administered questionnaire. It was prepared originally in English and translated into local language Tigrigna for the purpose of data collection to make easy and understandable. For each kebeles, two diploma Midwifery and one health extension workers for data collection and 1 BSc Midwife for supervisor, total of 9 data collectors and 3 supervisors were recruited for data collection.

### 3.9. Data Quality Control

The questionnaire was prepared in English, and then translated to Tigrigna (local language) and back to English to maintain consistency of the tool. Before the actual data collection one day training was given for data collectors and supervisors. The data was checked daily for completeness and accuracy by principal investigator, co- investigators and supervisors. Pretest was conducted on (5%) of the sample size out of the study area in Wukro town to ensure the validity, reliability, and clarity of the data collection instrument. Cron batch alpha was used to check reliability of the tool. Finally; at the end of the pretest according the result some modification was under taken.

### 3.10. Data Processing and Analysis

Data cleaning was performed to check for accuracy, completeness, consistencies and missing values and outliers. After the data has checked for completeness and accuracy, it was coded and entered to Epi data version 4.4.4.1 and exported to Statistical Package of Social Science (SPSS) version 22 for statistical analysis. Descriptive analysis was performed using mean, standard deviation, frequencies, proportion to describe study population in relation to dependent and independent variables. Bivariable and multivariable logistic regression model was fitted to identify association between dependent and independent variables. Binary logistic regression was used to identify relation of each independent variable with dependent variables. Variables having p-value less than 0.2 in binary logistic regression were entered to multivariable logistic regression using back ward conditional method for further analysis and to adjust the effect of confounding variables. In multivariable analysis adjusted odds ratio with 95% confidence interval (CI) was used to determine the strength and direction of the association between independent and dependent variable. Model fitness was checked using Hosmer and Lemshow goodness -of -fit, and a p-value >0.05 with 95% confidence interval (CI) was considered as good fitted model.

## 4. Ethical Considerations

Ethical clearance was obtained from the Institutional Review Board (IRB) of Adigrat University on the behalf of the Ethical Review Committee of collage of Medicine and Health science. A letter of cooperation was obtained from Adigrat town health office. Verbal and written informed consent was obtained from each study participants after explanation of the purpose of the study. Any mother who were not willing to participate in the study was not forced to participate, no personal identifications was included in the data sheet, withdrawal from the study was possible at any time and all data taken from the participants was kept strictly confidential and used only for the study purpose.

## 5. Results

### 5.1. Socio-demographic Characteristics of the Respondents

In this study, a total of 357 mothers who gave birth in the last 12 months were interviewed with a response rate of 98.9%. The median age of the respondents was 28 years  $\pm$  6 IQR and the median age of their child was 6 months  $\pm$  4 IQR. Majority (85.4%) of respondents were married out of them 150 (42%) of their husband's occupation were private employee and 105 (24.9%) of their husband's educational status were collage and above. One hundred seventy four (48.7%) of mothers were secondary education. From 357 study participants (67.5%) of the Mothers occupation were house wife. Only 69 (19.3%) of respondents were household heads. Almost all respondents (88.2%) were orthodox religious followers and 339 (95%) Tigrignan by ethnicity (Table 1).

**Table 1.** Socio-demographic characteristics of mothers who gave birth in the last oneyears in Adigrat Town, Eastern Tigray zone, Northern Ethiopia, 2024 (n=361).

Variable	Category	Frequency (n)	Percent (%)
Religion	Orthodox	315	88.2
	Muslim	13	3.6
	Catholic	29	8.1
Age of respondent	$\leq 20$	44	12.3
	21-34	262	73.4
	$\geq 35$	51	14.3
Age of child	0-3 months	150	42
	4-6 months	76	21.3
	7-12 months	131	36.7
Family size	$\leq 3$	316	88.5
	$\geq 4$	41	11.5
Age of husband	20-29	50	16.5
	30-39	193	63.5
	40-49	56	18.4
	$\geq 50$	5	1.6
	Single	40	11.2
Marital status of the mothers	Married	305	85.4
	Widowed	6	1.7
	Separated	1	0.3
	Divorced	5	1.4
Educational status of husband (n=305)	Unable to write and read	12	3.9
	Primary school	91	29.9

Variable	Category	Frequency (n)	Percent (%)
Occupational status of husband (n=305)	Secondary school	97	31.8
	Collage and above	105	34.4
	Farmer	8	2.6
	Merchant	46	15.1
	Governmental employee	40	13.1
	Private employee	150	49.1
	Daily laborer	20	6.5
	Students	1	0.3
	Others	40	13.3
	Housewife	241	67.5
Occupational status of mother	Merchant	18	5
	Private employee	27	7.6
	Governmental employee	41	11.5
	Farmer	2	0.6
	Daily laborer	2	0.6
Educational status of mother	Student	26	7.3
	Unable to read and write	16	4.5
	Primary school (1-8)	84	23.5
	Secondary school (9-12)	174	48.7
Access to mass media	Collage and above	83	23.3
	Yes	231	64.7
Household head	No	126	35.3
	Yes	69	19.3
Family wealth index	No	288	80.7
	Low	52	14.6
	Medium	29	8.1
	High	276	77.3

### 5.2. Socio-cultural Related Characteristics of the Study Participants

Among respondents, one hundred seventy four (48.7%) of the mothers and new born children get service/treatment from a place other than health institutions, and out of those 109 were got services from traditional healers during pregnancy. Majority of respondents (66.3%) had bad attitude on maternal health care service.

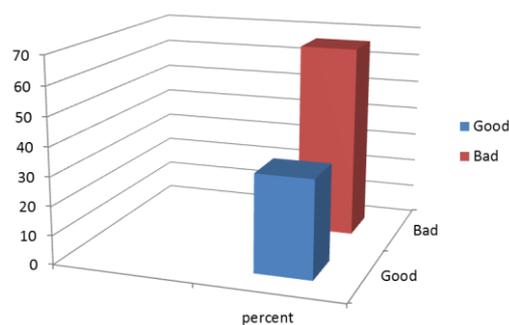


Figure 1. Attitude of mothers who gave birth in the last 12 months in Adigrat town, Northern Ethiopia 2024.

### 5.3. Reproductive/Obstetrics and Maternity Health Care Service Related Variables

#### 5.3.1. Reproductive/Obstetrics Related Characteristics

Majority of study participants, 152 (42.6%) their pregnancy was for the second time, whereas, 41 (11.5%) of the

women had four and more pregnancies. More than half (65.8%) of the respondents their last pregnancy was planned, and more than 3/4<sup>th</sup> (85.4%) of the respondents' last pregnancy was wanted. One hundred eight (30.3%) of mothers had only one child, and 33 (12.3%) of mothers had four and more children (Table 2).

**Table 2.** Reproductive/obstetrics related characteristics of mothers who gave birth in the last one years in Adigrat Town, Eastern Tigray zone, Northern Ethiopia, 2024 (n=361).

Variable	Category	Frequency (n)	Percent (%)
Number of pregnancy	1	104	29.1
	2	152	42.6
	3	60	16.8
	≥ 4	41	11.5
Was the pregnancy planned	Yes	235	65.8
	No	122	34.2
Was the pregnancy wanted	Yes	305	85.4
	No	52	14.6
Number of alive children	1	108	30.3
	2	142	39.8
	3	63	17.6
	≥ 4	33	12.3
Abortion history	Yes	237	66.4
	No	120	33.6
Service satisfaction	very satisfied	38	10.6
	Satisfied	202	56.6
	Very dissatisfied	81	22.7
	Dis satisfied	36	10.1

#### 5.3.2. Maternal Health Care Service Utilization Related Characteristics of Respondents

Around 2/3rd of mothers (66.4%) never heard about maternal health care services. More than half (50.4%) of the study participant's start their first antenatal care follow up at 4-7 months of pregnancy. More than one third of 119 (33.3%) of the women their ANC follow up were at public hospitals.

Among respondents, 130 (36.4%) of the women had four and more times ANC follow up during their recent pregnancy. Among the study participants, 254 (71.1%) were gave birth their last baby at the public hospital, and twenty (5.6%) of the respondents delivered their last baby at home. More than half of study participants 214 (59.9%) were did not get available transportation to health facility (Table 3).

**Table 3.** Maternal health care service utilization related characteristics of respondents mothers who gave birth in the last one years in Adigrat Town, Eastern Tigray zone, Northern Ethiopia, 2024 (n=361).

Variable	Category	Frequency (n)	Percent (%)
Mother ever heard about health care service	Yes	120	33.6
	No	237	66.4
Husband ever heard on maternal health care service (n=305)	Yes	244	80
	No	61	20
About what health care service (n=262)	ANC	63	24.1
	ANC and DC	1	0.4
	ANC, DC and PNC	198	75.5
Number of ANC visit	<4 visit	227	63.6
	≥ 4	130	36.4
Months of pregnancy at first visit (n=357)	1-3 months	177	49.6
	4-7 months	180	50.4
	Heath center	100	28
Place of ANC (n=357)	Private hospital	89	24.9
	Public hospital	119	33.3
	HC and PH	2	0.6
	HC, PH and PI	1	0.3
	HC and private	5	1.4
Time spent of ANC visit	PH and private	41	11.5
	<15 minutes	128	35.9
	≥15 minutes	229	64.1
Place of last baby delivery (n=357)	Health center	58	16.2
	Public hospital	254	71.2
	Private	25	7
PNC visit (n=357)	Home	20	5.6
	Yes	148	41.5
Available transportation	No	209	58.5
	Yes	214	59.9
Internally displaced	no	143	40.1
	Yes	32	9
Distance to health facility	No	325	91
	0.5 -4km	354	99.2
Permission from work place	≥ 5km	3	0.8
	Yes	224	62.7
Health care provider support	No	133	37.3
	Yes	234	65.5
ANC counseling on MCC	No	123	34.5
	Yes	239	66.9

Variable	Category	Frequency (n)	Percent (%)
	No	118	33.1

### 5.4. Proportion of Drop Outs from Maternity Continuum of Care

The overall magnitude of drop out from the maternity continuum of care was 237 (66.4%) [95%CI (61.3-70.9)]. In addition to this in this study 200 (60.6%) of respondents had less than four ANC visit, 20 (5.6%) also drop out from skill birth attendant and 209 (58.9%) of them had no postnatal follow up after meeting with skill birth attendant.

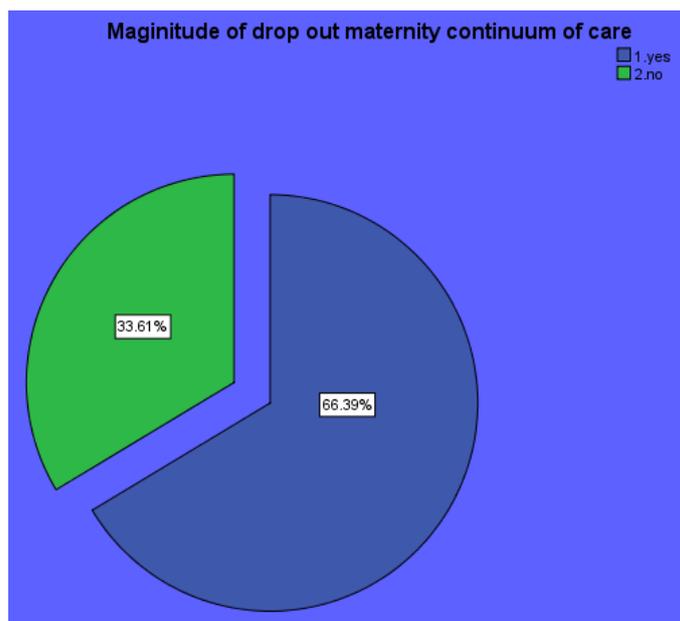


Figure 2. Drop out from maternity continuum of care mothers who gave birth in the last one years in Adigrat Town, Eastern Tigray zone, Northern Ethiopia, 2024 (n=361).

### 5.5. Factors Associated with Drop out from Maternity Continuum of Care

Variables having p-value of less than 0.2 in the bivariable analysis were considered as significant variables so that, they were included into the multivariable analysis, household head, mother ever heard on maternal health care service, health care service out of health facility, exposure to mass media, wanted pregnancy, planned pregnancy, number of ANC visit, permission from work, availability of transportation, abortion history and attitude were statistically significant factors associated with drop out from maternity continuum of care in multivariable logistic regression analysis. After adjusting the effect of confounding variables, mother ever heard on maternal health care service, health service out of health facility, abortion history, planned pregnancy, number of ANC and attitude of mother to maternal health care service were statistically significant factors associated with drop out from maternity continuum of care in multivariable

logistic regression analysis. Mothers never heard on maternal health care service were 4.2 times more likely to drop out from maternity continuum of care (AOR=4.179 (1.107, 15.783) as compared to their counterparts. Respondents who get service out of health facility were 5 times higher dropout rate (AOR 5.136 (1.988, 13.267) relative to mothers did not get health service out of health facility. Mothers who had no abortion history were 1.4 times more likely to drop out from maternity continuum of care AOR=1.424 (1.113, 12.133) as compared to mother who had abortion. Those mothers whose pregnancy was un planned were 5.5 times more likely to drop out from maternity continuum of care as AOR=5.478 (1.902, 15.777) compared to those mothers who had planned pregnancy. Respondents who had less than 4 ANC were 5.5 more likely to dropout from maternity continuum of care (AOR= 5.583 (2.598, 11.997) as compared to mothers who had more than or equals to 4 ANC visit. In addition, the odds of drop out from maternity continuum of was 15 times higher in mothers who had bad attitude (AOR=15.049 (2.489, 32.997) as compared to their counter parts (Table 4).

**Table 4.** Bivariable and multivariable logistic regression analysis showing factors associated with drop out from maternity continuum of care mothers who gave birth in the last one years in Adigrat Town, Eastern Tigray zone, Northern Ethiopia, 2024 (n=361).

Variables	Drop out		COR (95% CI)	AOR (95%CI)
	Yes	no		
House hold head				
Yes	55	14	2.28 (1.23, 3.45)	0.283 (0.121, 0.66)
No	182	106	1	
Mother ever heard on maternal health care service				
Yes	109	11	1	1
No	153	84	5.44 (2.771, 10.682)	4.179 (1.107, 15.783)*
Health service out of health facility				
Yes	147	27	5.62 (3.541, 12.601)	5.136 (1.988, 13.267)**
No	90	93	1	1
Exposure to mass media				
Yes	89	142	1	1
No	31	95	1.921 (1.183, 3.18)	0.268 (0.121, 0.661)
Abortion history				
Yes	205	32	1	1
No	96	24	1.601 (1.962, 8.342)	1.424 (1.113, 12.133)
Planned pregnancy				
Yes	112	123	1	1
No	8	114	13.468 (8.234, 22.567)	5.478 (1.902, 15.777)*
Wanted pregnancy				
Yes	216	89	1	1
No		37	5.986 (16.52, 45.342)	3.321 (1.381, 10.579)
Available transportation				
Yes	169	45	1	1
No	68	75	4.142 (2.345, 6.890)	2.019, 1.031, 3.954)
Number of ANC				
<4	180	47	6.542 (3.837, 13.409)	1
≥ 4	48	82	1	5.583 (2.598, 11.997)**
Attitude				
Good	118	2	1	1
Bad	168	69	24.232 (16, 201, 45.678)	15.049 (2.489, 32.997)*
Permission from work				
Yes	213	11	1	1
No	101	32	6.129 (0.795, 47.773)	4.831 (0.533, 34.811)

NB: \*=P<0.05 \*\*=P<0.001 1 Reference Hosmer and Lemeshow goodness-of-fit p-value=0.644 COR =Crude odds ratio, AOR=Adjusted Odds Ratio CI=Confidence interval

## 6. Discussion

Drop out from maternity continuum of care is public health problem in world wide as well as in Ethiopia. In this study the over all prevalence of drop out from maternity continuum of care was found high which was 237 (66.4%) [95%CI (61.3-70.9)]. This finding (66.4%) is higher than the studies conducted in Nigeria (38.1%), Tanzania (10%) Nepal (50%) Northwest Ethiopian and Addis Abeba [58.39%] (32.2%) [11, 19-22]. This discrepancy may be due to socio-cultural difference, awareness on maternal health care service, access to health care service and study area and sample size variation.

This finding is also consistent with studies conducted in Debre Berhan town (69.1%), Northwest Ethiopia [63.4%] [17, 23]. This similarity might be due to they have similar socio-cultural practices and both Adigrat and DebreBerhane founds in northern part of Ethiopia and in both there was war and they may affect the maternal health care service.

However, it is lower than the national prevalence of drop out from maternity continuum of care [93.4%], AribaMinche Zuria [90.3%], Chelia district [88.5%], west Gojjam Zone [87.9%] from Tanzania Demographic Health Survey [83.86%], [15, 22, 24-27]. The difference might be due to socio-demographic, educational status and cultural variability and year of study. This two to three years variation of may bring awareness differences about maternal health care service and health-seeking behavior of the community.

Concerning factors associated with drop out maternity continuum of care mothers never heard on maternal health care service were 4.2 times more likely to drop out from maternity continuum of care (AOR=4.179 (1.107, 15.783) as compared to their counterparts. The possible explanation might be due to the fact that mothers who heard on maternal health care service may have good knowledge on the advantage of maternal health care service in reduction of maternal and neonatal mortality and may have good health seeking behavior than mothers never heard on maternal health care service [21, 28].

This study also indicated that respondents who get service out of health facility were 5 times higher dropout rate (AOR =5.136 (1.988, 13.267) relative to mothers did not get health service out of health facility. One potential explanation could be that moms receiving care outside of a medical facility lack awareness of the risks associated with traditional practices, which are mostly influenced by their grandparents.

Furthermore, mothers whose pregnancy was un planned were 5.5 times more likely to drop out from maternity continuum of care as AOR=5.478 (1.902, 15.777) compared to those mothers who had planned pregnancy. This result is supported by study done in North West Ethiopia, AribaMinche Zuria, and Chelia district [21, 25, 26]. A possible explanation for the correlation between MCC and intended pregnancy is that early pregnancy planning would decrease

ANC delays, perhaps increasing the likelihood of many visits along the MCC [29-31].

Compared to mothers who had abortion history, mothers who had no prior abortions had 1.4-fold increased risk of dropping out of the maternity continuum (AOR=1.424 (1.113, 12.133). This might be due to the fact that the past bad history of pregnancy making them to focus carefully on the present pregnancy outcome [31, 32] and the effort of health care providers intervention with bad obstetrics history might increase the health seeking behaviors [33] this might be help to achieve MCC with mothers had abortion history.

In this study, respondents who had less than 4 ANC were 5.5 more likely to dropout from maternity continuum of care (AOR= 5.583 (2.598, 11. 997) as compared to mothers who had more than or equals to 4 ANC visit. This conclusion may be explained by the fact that early initiation of ANC provides a good chance for mothers to get a good health promotion and to learn about pregnancy danger signs and obstetric risks in early time and this will improve health seeking behaviors of the mothers [30, 31, 34].

In addition, the odds of drop out from maternity continuum of was 15 times higher in mothers who had bad attitude (AOR=15.049 (2.489, 32.997) as compared to their counter parts. The explanation could be that mothers who have a positive attitude toward maternal health care services may begin early antenatal care and have the opportunity to discuss the significance of the maternity continuum of care in reducing maternal and infant mortality with their healthcare provider.

## 7. Strength and Limitations of the Study

### 7.1. Strength of the Study

It is community based study it takes more resources.  
Family wealth index was computed by using PCA.

### 7.2. Limitations of the Study

It could be prone to recall bias since data were taken from the mothers backward history.

This study is not supported by qualitative study to dig out the cultural belief of the community.

## 8. Conclusion

This study revealed that drop out from maternity continuum of care was high as compared to WHO recommendations. Mothers ever heard on maternal health care service, planned pregnancy, number of ANC visit, mothers attitude, abortion history and health service out of health facility were statically significant independent factors associated with drop out from maternity continuum of care.

## Abbreviations

ANC	Antenatal Care
AOR	Adjusted Odds Ratio
COR	Curde Odds Ratio
EDHS	Ethiopian Demographic Health Servey
HC	Health Center
HI	Hospital
MCC	Maternity Contunnm of Care
PCA	Principal Componet Anlaysia
PNC	Post Natal Care
SPSS	Stastical package for Social Science
WHO	World Health Organazation

## Availability of Data and Materials

The corresponding author might seek access to the datasets used to support the results in this article.

## Authors' Contributions

MG and WM were involved in the study's inception and design, while MG, WM and KMW were responsible for data interpretation and the first draft of the publication. In commenting on the document, NSK and MG took part. Each author reviewed the completed work critically and gave their approval after reading it.

## Ethics Approval and Consent to Participate

The Institutional Review Board at Adigrat University provided ethical clearance and approval. After then, a formal letter was sent to the local health office of Adigrat. Participants gave their verbal informed permission after being fully aware of the study's goal and aim. At every stage of the research, confidentiality was upheld. Participants were asked to participate in the study voluntarily, and those who wished to withdraw from it were given full permission to do so.

## Consent for Publication

Not applicable.

## Funding

Author(s) have not received any specific funding for this study.

## Conflicts of Interest

The authors declare no conflicts of interest.

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