

# Prevalence and Factors Associated with Post Natal Care Utilization in Abi-Adi Town, Tigray, Ethiopia: A Cross Sectional Study

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## Abstract

**Background:** The main causes of maternal deaths are postpartum hemorrhage, eclampsia, obstructed labor and sepsis. PNC is yet marginalized, little attention and an effort have been paid by health care providers and policy makers. PNC utilization is still low and MMR is high. Therefore the aim of this study was to assess prevalence and factors associated with postnatal care utilization in Abi-Adi, Tigray, Ethiopia.

**Objective:** The objective of this study was to assess prevalence and factors associated with postnatal care utilization in Abi-Adi town, Tigray, Ethiopia.

**Methods:** A community based cross sectional study design was used. Using simple random sampling 394 mothers were selected the data were analyzed using SPSS version 16. Bivariate and Multivariate logistic regression was used to identify the risk factors associated with the outcome variable.

**Result:** The finding revealed that postnatal care follow up in the study area is low (11.9%). Maternal education, women's attitudes towards the importance of postnatal care, health workers counseling to mothers to return back for postnatal care, maternal decision making power were the main predictors of post natal care in the study

**Conclusion:** Postnatal care utilization in the study area is low. Maternal education, mother's attitude towards importance of postnatal care, Mothers counseling /advice to return back for postnatal care and mother's decision to attend postnatal care were the main factors associated with PNC.

**Recommendation:** Strengthening the maternal education, increase maternal knowledge, information and counseling/ advice to mothers to come back for PNC and strengthening monitoring and evaluation with strong integration of all MCH services, increase women's empowerment in decision making and quality service.

**Keywords:** *Postnatal care, women, Tigray, Ethiopia.*

## 1. Introduction

### 1.1 Background

Maternal deaths are the tip of the iceberg. For every maternal death, about 20 or more women's are estimated to suffer from acute or chronic pregnancy related illnesses [1]. Globally, millions of mothers suffer from pregnancy related complication. More than 636,000 women died each year worldwide. Nearly all of the deaths (99%) are in the developing countries and 270,000 women were died each year in Africa and 46,000 in Ethiopia [2]. Every minute a woman dies during labor, after labor and labor related complications. The highest maternal mortality is in sub-Saharan Africa, with a lifetime risk of 1 in 16 as compare to western nations 1:2800, with a global ratio of 400 maternal deaths per 100,000 live births [3]. And also Ethiopia is one of the countries with the highest maternal mortality ratio which is currently estimated at 676 maternal deaths per 100,000 live births based on EDHS 2011 and it is more than to the 2005 EDHS 673 deaths per 100,000 [1]. In many developed and non developed countries, including Ethiopia, complications of pregnancy and childbirth are the leading causes of maternal death among women of reproductive age [2]. Most of the maternal deaths occur at home, unrecorded and remain invisible to all but for their families. Millions of mothers more suffer severe illness each year, and unknown numbers are affected with lifelong disabilities [4]. The main causes of maternal mortalities are postpartum hemorrhage, eclampsia, obstructed labor and sepsis [3]. Approximately 30-40% of direct maternal deaths

in Africa are due to hemorrhage, mostly in the postpartum period [5]. Different literatures shows that the majority (62%) of maternal deaths and disabilities occurs during postpartum period one hour after the birth of placenta and ends six weeks due to lack of postnatal care follow up. The first few hours of postpartum periods are extremely important and should never be left unattended post natal care at this time. [6]. Worldwide 130 million babies born every year, about 4 million die in the first 4 weeks of life the neonatal period. Most neonatal deaths (99%) arise in low-income and middle income countries, and about half occur at home. In poor communities, many babies who die are unnamed and unrecorded, indicating the perceived inevitability of their deaths [7]. Many studies indicates that every year in Africa, at least 125,000 women's and 870,000 newborns die in the first week after birth, yet this is when coverage and programs are at their lowest along the continuum of care [8]. Reduction of maternal mortality is one of international community's political agenda especially in view of the increased attention on the Millennium Development Goals [9]. Responding to the maternal health care challenges is an important issue [10]. And the MDGs main focus is to improve maternal health and reduction maternal mortality by three-fourth (75%) between 1990 and 2015 [11]. Despite of the fact that the majority of maternal and newborn deaths occur within the postnatal period; there is lack of systematic implementation of the post natal care package, no consistently measured the indicators of national PNC programs and also monitoring of post natal care service has a problem [8]. In general, maternal and neonatal mortality rate in the postnatal period is too much marginalized and neglected period [12]. Postnatal care is one of the most important maternal health-care interventions not only for prevention of impairment and disabilities but also for reduction of maternal mortality [13]. Even though postnatal care is important and life saving service it is low in coverage worldwide (30%) seven out of ten mothers not receive any postnatal care, in the sub-Saharan Africa 13% and Ethiopia 8% received post natal care check up [5,14]. Adequate utilization of postnatal care can help to reduce maternal mortality and morbidity among mothers and their babies. To improve maternal, newborn and infant health status through increasing the proportion of women receiving essential postpartum services is strategies of many countries [5]. In Ethiopia, including Tigray

and the study area information about post natal care is limited. There are few published studies on factors that associated with post natal care. Therefore, the purpose of this cross-sectional study was to explore factors that associated with post natal care follow up one hour after the birth of placenta and ends six weeks by using a structured questionnaire. Mothers those who give birth in the period of (12 months) from July 1, 2011 to June 30, 2012 were included in the actual study.

## 1.2 Statement of the problem

Postpartum period starts from one hour after the birth of placenta and ends 42 days [2]. It is risk period especially the first 24 hours and over the first seven days after delivery that needs postnatal care follow up using the WHO standards contact time within one hour of birth to 24 hours, 2-3 days, 6-7 days, at 6 weeks and extra contacts two or three visits for LBW or mothers life with HIV should have [8]. Knowing of the prevalence and associated factors of post natal care utilization is very important in reduction of maternal and new born mortality. Worldwide, only 30% of the mothers are following the postnatal care [15]. Based on an analysis of 23 countries DHS 2005 more than two thirds of mothers in sub-Saharan Africa gives birth at home and for instance Eritrea 92%, Mali 85% and Rwanda 70% of mothers did not receive any post natal care checkup [8]. Only 13% of the mothers in the sub-Saharan Africa who follows postnatal care checkup (5). EDHS 2011 also show that only 8% of mothers receive postnatal care checkup [1]. The low coverage of postnatal care is causing to continuous high maternal and new born morbidity and mortality that affects MDGs 4 and 5. It is also challenge for planning and implementing of PNC as well as many opportunities are missed with low PNC coverage including exclusive breastfeeding, PMTCT, providing of family planning and maternal and new born care [4, 9, 16]. And also there is high maternal death that affects the family, new born even old children survival and increase number of orphans, decrease productivity of the households. Despite of the fact that high maternal and new born morbidity and mortality there has been low/little political and professional attention is given towards postnatal care. There are many factors that affect postnatal care checkup such as socio-economical status, geographical location, maternal education, culture, belief, religions, income, quality of care,

access, availability, previous post natal care experience, health care system and women participation in decision making are some of the factors that affect PNC [15]. And also there are discrepancies in access to maternal health care between the rich and poor, urban and rural and educated and uneducated societies, and also there is large gap in PNC coverage between developed and developing countries. There is lack of knowledge and information on post natal care service including the postpartum period and its danger sign symptom. Mothers not know what is post natal care service, when and where to receive and they do not come back to health facility after they give birth even though they have access and suffering with the complications. Health education that provide by health professionals is not sufficient, there is poor approach of health providers and low quality service. Therefore the study was design to determine the prevalence of post natal care utilization and its associated factors in Abi-Adi town Tigray Ethiopia. June 2013.

### **1.3 Justification/rationale of the study**

Many Studies have been showed that the coverage of postnatal care follow up is too low and what factors affect the postnatal care follow up are not well identified. Despites the fact that, it has very significant impact on maternal and new born morbidity and mortality; postnatal care is yet marginalized/ neglected and little attention and efforts has been paid by health care practitioners and policy makers to this simple preventable and avoidable problem. There is policy and strategy based on post natal care follow up but not applied properly and there is a little information and less actual practice in postnatal care follow up at the ground level in the community. Therefore it is the right time to conduct this study on assessment of factors associated with recommended postnatal care utilization inorder to contribute an input for better planning, implementation of postnatal care and to provide other opportunities, attention and efforts by all concerned sectors to reduce

maternal and infant mortality and to achieve the MDGs 4 and 5.

## **2. Methods and Materials**

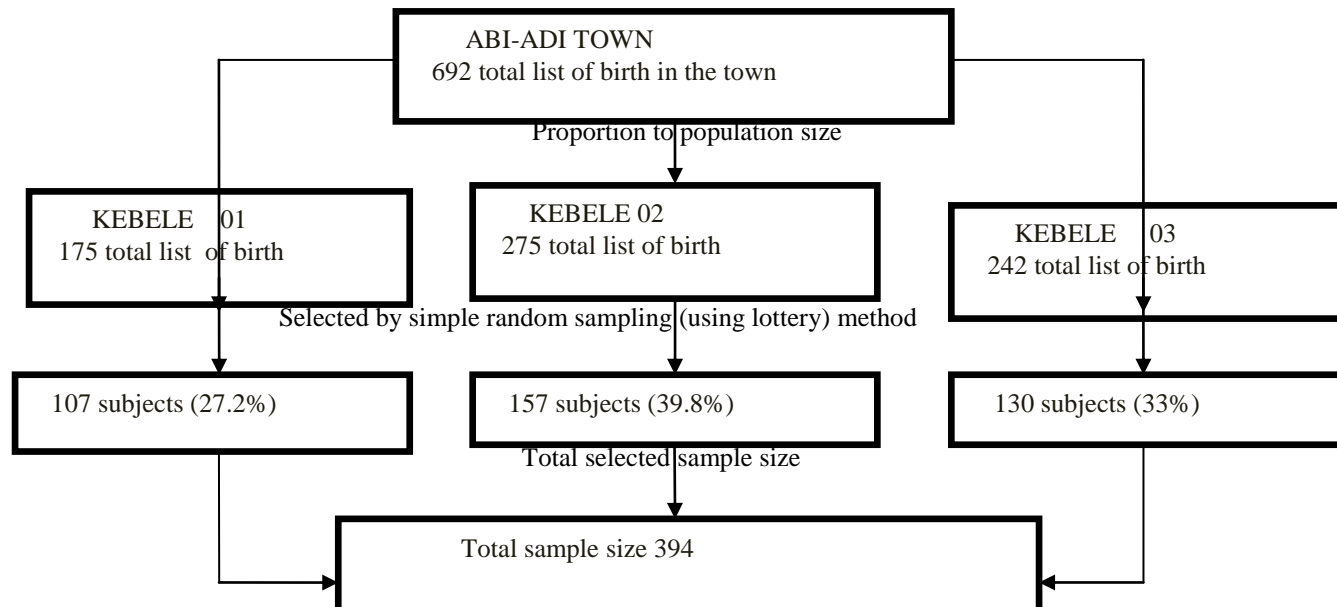
### **2.1 Study design, area and Population**

Community based cross-sectional quantitative study design was conducted to determine the prevalence of postnatal care utilization and associated factors in Abi-Adi, Tigray, Ethiopia from February to June, 2013. The town is located at the western part of Tigray, about 878 kilometers far away from Addis Ababa and has an estimated population of 18198. From the total populations 9053(49.2%) are males and 9145(50.8%) females. In this study all mother's who gave birth from July 1, 2011 to June 30, 2012 and permanent residents in Abi-Adi town were included where as women who were critically ill were excluded from the study.

### **2.2 Sample size determination and sampling procedures**

A total of 394 mothers were selected using a single proportion population by considering the following assumptions: 95% confidence level, 5% margin of error, 37% prevalence of postnatal care [17] and 10% non response rate. From the health extension workers birth registration books (the list of 692 mothers) including their identification numbers and contact addresses were obtained for mothers who give birth from July 1, 2011 to June 30, 2012 in the three kebeles of the town. And from the total (692 mothers), 175, 275 and 242 mothers were from Kebele 01, from Kebele 02 and from Kebele 03, respectively. The total sample size (394 mothers) was allocated to each kebele using population proportion to size. Finally from each kebele a total of 394 mothers were selected using simple random sampling. During data collection, the data collectors were follow the mothers list and their contact addresses and then continue until the end of data collection.

### Schematic presentation of sampling procedure



### 2.3 Data collection procedures

Data were collected using structured questionnaire. The questionnaire was developed and adapted by reviewing different literatures. The questionnaire was translated to the local language (Tigrigna) and back to English by experts of the language to make consistency and to make easily understood by the data collectors and interviewees. Six female nurses were participated in the data collection process and supervisors were checked daily activities of data collection process, consistency and completeness of the questionnaire.

### 2.4 Data Quality and management:

The investigators were trained the data collectors and supervisors for two days based on how to gather the appropriate information, procedures of data collection, the whole contents of the questionnaire, how to take verbal consent, how to approach participants, general information about postnatal care follow up and the objective of the study. Incomplete and unclearly filled questionnaires were given back to supervisor and interviewers for completion of the questionnaire. To assure the quality of the study, data collectors and supervisor were nominated from other area to prevent data collector's bias. During data collection period regular supervision and follow-up was made by the supervisors and

investigators. Prior to the actual data collection, 5% of the sample sizes were pre-tested at worqamba town which have similar socio-demographic and postnatal care service characteristics with Abi-Adi town. The collected data was checked for its completeness and clarity on daily basis and correction was made accordingly.

### 2.5 Data processing and analysis

Data entry was done using Epi-info and exported to SPSS version 16.0 for data cleaned, recoded and analysis. Frequency and percentage were used for the descriptive part and logistic regression model were used to identify the statistically significant variables. Variables that have statistically significant at bivariate logistic regression with  $p\text{-value} < 0.05$  were entered in to the multivariate logistic regression. Finally the results were presented using tables and graphs as clearly shown in report below.

### 2.6 Operational Definitions

**Postnatal care:** Care was given to a mother for a period of six weeks from the time of delivery.

**Postpartum period:** The period that starts from one hour after the birth of placenta and up to ends of six weeks after delivery

**Recommended postnatal care:** Care was given to a mother for a period of six weeks from the time of delivery using WHO standards contact

time within one hour after birth, at 2-3 days, 6-7 days, and Extra contacts for those LBW/mothers life with HIV.

**Knowledge:** State of awareness of mothers on postnatal services.

**Critically ill:** Mothers who were unconscious, not able to talk and to listen

**Income:** Low level<570 Birr/month, Medium level 570-1140 Birr/month and Rich >Birr/month 1140(39).

## 2.7 Ethical consideration

Ethical clearance was obtained from Mekelle University, College of health sciences Ethical Review Board. Official letters were obtained from Tigray Regional Health Bureau to Abi-Adi woreda administration and district health office and also official letters was written from the woreda administration to the three kebeles. Verbal consent was taken from each respondent and clearly explained the purpose of study, the

right to withdraw from the study. Participation was voluntary, confidential and private information would be protected.

## 3. RESULTS

### 3.1 Socio-demographic characteristics

In this study a total of 394 women's from three kebeles of the town were participated with a response rate of 100%. About 120 (30.5 %) of the respondents were at the age group 25-29, almost all of the respondents 362 (91.9 %) were orthodox, less than half 167 (42.4%) of the respondents were unemployed, regarding their education 123 (31.2 %) of the mothers were grade 1-8, majorities 343 (87.1%) of mothers were married, nearly half 192(48.7%) of the mothers were in the low level income (<570br/month) and all 394(100%) of the respondents were Tigray. [Table 1]

**Table 1: Socio-demographic characteristics of the respondents on PNC utilization in Abi-adi Tigray, Ethiopia 2013**

Variables		Freq. (%)	PNC (%)
Maternal age in years	15-19	34(8.6%)	5(14.7%)
	20-24	103(26.1%)	13(12.6%)
	25-29	120(30.5%)	19(15.8%)
	30-34	79(20.1%)	3(3.8%)
	35-39	46(11.7%)	6(13)
	40-44	12(3.0%)	1(8.3%)
Maternal religion	Orthodox	362(91.9%)	44(12.2%)
	Muslim	32(8.1%)	3(9.4%)
Maternal occupation	Unemployed	167(42.4%)	13(7.8%)
	Civil servant	117(29.7%)	27(23.1%)
	Merchant	110(27.9%)	7(6.4%)
Maternal education	Non educated	111(28.1%)	5(4.5%)
	Grade 1-8	123(31.2%)	9(7.3%)
	Grade 9-12	106(26.9%)	12(11.3%)
	College and above	54(13.7%)	21(38.9%)
Marital Status	Married	343(87.1%)	42(12.2%)
	Divorced	34(8.6%)	5(14.7%)

	Cohabiting/friends	17(4.3%)	0(0%)
<b>Maternal Income</b>	<570 Birr/month	192(48.7)	14(7.9)
	571-1140 Birr/month	118(29.9)	15(14.6)
	>1141 Birrr/ month	84(21.3)	18(27.3)

### 3.2 Past Obstetrical History of the Respondents

and 239 (60.7%) of mothers had 1-2 survived children. [Table 2]

Looking the obstetrical history above half of respondents 233 (59.1%) were 1-2 pregnancy

**Table.2: Frequency distribution of respondents by their obstetrical characteristics in Abi-Adi town, Tigray Ethiopia 2013**

Variables		Freq. (%)	PNC (%)
<b>Number of pregnancy</b>	1-2	233(59.1%)	32(13.7%)
	3-4	120(30.5%)	11(9.2%)
	5+	41(10.4%)	4(7.8%)
<b>Number of Survival children</b>	1-2	239(60.7%)	32(13.4%)
	3-4	116(29.4%)	11(9.5%)
	5+	39(9.9%)	4(10.3%)

### 3.3 Respondent's knowledge and practices on Postnatal care utilization:-

About 67 (17%) of the mothers heard information about PNC, from those who heard information 54(80.6%) were provided the information from health extension workers and only 34(8.6%) of respondents were correctly answered the period when to start the postnatal care. Only 62 (15.7 %) of respondents were knows the danger sign and symptom comes after birth. From those knows the danger sign and symptom 55(88.7%) were mentioned excess bleeding and 7(11.3%) utrine infection. [Table 3]

Almost all 368 (93.4%) of the respondents were attended antenatal care/ANC/ during their last pregnancy and majorities 234 (63.6%) of the respondents were follow ANC in health center and the remaining 134(36.4) were follow in hospital. [Table 3] From those who give birth in health institutions; 294 (75.1%) of the mothers were give birth in hospital, from those who give birth in Health center and Hospital only 60(17%) of respondents were received counseling/advise from the health workers to come back for post natal care follow up. More than half 221(56.1%) of respondents were utilizing family planning and 181(45.9) of them were used injectable method of family planning. [Table 3]

**Table.3. Respondent's knowledge and practices on Postnatal care utilization in Abi-adi Tigray, Ethiopia 2013.**

Variables		Freq. (%)	PNC (%)
Have you heard any information about PNC	Yes	67(17%)	26(38.8%)
	No	327(83%)	21(6.4%)
Information distribution (By whom)	HEW	54(80.6%)	18 (33.33%)
	WD army	13(19.4%)	8(61.54%)
Knowledge on the period to start PNC	Yes	34(8.6%)	25(73.5%)
	No	360(91.4%)	22(6.1%)
The correct time to start PNC	Within 2-3 days	12(35.3%)	9(75%)
	7 to 42 days	22(64.7%)	16(72.7%)
Maternal knowledge on danger sign symptom (SS)	Yes	62(15.7%)	25(40.3%)
	No	332(84.3%)	22(6.6%)
Types of danger sign symptom (SS) mothers know	Excess bleeding	55(88.7%)	22(40%)
	Uterine infection	7(11.3)	3(42%)
Antenatal care attendance/ANC/	Yes	368(93.4%)	45(12.2%)
	No	26(6.6%)	2(7.7%)
If yes where did you attend ANC	Health center	234(63.6%)	22(9.4%)
	Hospital	134(36.4%)	23(17.2%)
Where did you give birth?	Home	40(10.2%)	4(10%)
	Hospital	296(75.1%)	36(12.2%)
	Health center	58(14.7%)	7(12.1%)
If deliver at home who assisted you?	HEW	11(27.5%)	0(0%)
	Relative/neighbors	29(72.5%)	4(3.8%)
If delivered at health institution have you got advice to return back for PNC check up	Yes	60(17%)	25(41.7%)
	No	294(83%)	18(6.1%)
Family Planning utilization	Yes	221(56.1%)	31(14%)
	No	173(43.9%)	16(9.2%)
Types of Family Planning (FP)	Pills	11(5%)	1(9.2%)
	Inject able	181(82%)	25(13.8%)
	Norplant	29(13%)	5(17.2%)

### 3.4 Health problem and treatment received for their health problem

Out of the total respondents 233(59.1%) of mothers mentioned that they had any health problem during their postpartum period. From those who have health problem 191(82%) of mothers were not treated for their health problem and only 42(18%) of respondents were received treatment for their health problem.

### 3.5 Respondent's reason for not attend post natal care follow up

About 158(45%) of the respondents mentioned that not need postnatal care service after delivery, minority 23(7%) of mothers answered that waiting time in health facility was too long and the rest 166(48%) were they don't know the benefits of postnatal care utilization.

### 3.6 Attitudes and perception of respondents towards postnatal care utilization

From the total respondents only 29(7.4%) of mothers were agree that PNC service was importance, whereas majorities 326(82%) of mothers were not sure whether PNC service was important or not. Regarding to the mothers attitude and perception on PNC only 67(17%) mothers were agree that PNC can minimizes maternal and infant mortality, but the majorities 295(74.9%) of mothers were not sure whether PNC can minimizes maternal and infant mortality or not. [Table 4] According to the health institution readiness 67(17%) of the mothers were agree that the health institution is equipped in material and man power whereas 282 (76.4%) of the respondents were not sure whether the health institution is equipped in material and man power or not. [Table 4]

**Table 4: Distribution of respondents according to their attitudes and perception towards postnatal care in Abi-Adi Tigray, Ethiopia 2013**

Variables		Freq. (%)	PNC (%)
Attitude of mothers on Important of PNC	Disagree	39(9.9%)	12(30.8%)
	Agree	29(7.4%)	5(17.2%)
	No sure	326(82.7%)	30(9.2%)
Attitude of mothers on PNC can minimize maternal mortality and infant mortality.	Disagree	39(9.9%)	3(7.7%)
	Agree	67(17%)	26(38.8%)
	No sure	295(74.9%)	18(6.1%)
Is health institution equipped in material man power?	Disagree	26(6.6%)	2(7.7%)
	Agree	67(17%)	26(38.8%)
	No sure	282(76.4%)	19(6.3%)



### 3.7 Access and health institution readiness towards PNC service

Regarding means of transportation; majorities 272(69%) of mothers were used ambulance during their delivery. From the total, 249(63.2%) of the respondents mentioned that they have

received better service in Hospital. Concerning to the service given in the Health center and Hospital, 310 (78.7%) of mothers answered that the service was good in both health institutions and only 44(11.2%) of mothers were mentioned that the service was bad in Health center and Hospital. [Table 5]

**Table 5: Access of transport and health institution preparedness towards postnatal care service in Abi-Adi-town, Tigray Ethiopia 2013**

Variable		Freq. (%)	PNC (%)
Means of transport use during birth	On foot	66(18.64%)	14(21.2%)
	Public transport	16(4.52%)	0(0%)
	Ambulance	272(76.84%)	29(8.2%)
Which health institution give better service during birth	Health Center	105(29.7%)	19(18.1%)
	Hospital	249(70.3%)	24(9.6%)
How do you describe the service	Good	310(26.1%)	10(9.7%)
	Bad	44(11.2%)	8(18.2%)

### 3.8 Decision making to seeking care and cultural influence towards postnatal care service

Regarding decision making 138(35%) of mothers were decide themselves to attend postnatal care and 124 (31.5%) of mothers were influenced by their husband to attend postnatal

care. Majority 335(85%) of the respondents were not follow postnatal care service because of cultural influence and from the types of cultures 205(52%) of the mothers mentioned that they were influenced by culture that devil can kill the mother if she go out from house before 45 days. [Table 6]

**Table.6. Decision making to seeking care towards postnatal care service in Abi-Adi-town, Tigray Ethiopia 2013**

Variables	Category	Freq. (%)	PNC (%)
Self decision to attend PNC	Yes	138(35%)	29(21%)
	No	256(65%)	18(7 %)
Is there any one hindered you from PNC?	No one	214(54.3%)	38(17.8%)
	Mother of husband	46(11.7%)	3(6.5%)

	Husband	124(31.5%)	6(4.8%)	9.
	Relatives/ neighboring	10(2.5%)	0(0%)	
<b>Culture prevents mothers from PNC</b>	Yes	335(85%)	40(11.9%)	
	No	59(15%)	7(12.5%)	
If yes, what are the cultures	Culture not allowed to go out post partum period	130(38.8%)	9(6.9%)	
	6. If go out before 45 days devils kill the mother	7. 205(61.2%)	8. 31(15%)	

### 3.9 Factors associated with postnatal care utilization

In the bivariate analysis, Maternal occupation, education, income, information heard about PNC, maternal knowledge on danger sign and symptom, place of ANC attendance, advice received to follow PNC, maternal attitude on importance of PNC, attitude of mothers on PNC that can minimize maternal and infant mortality and women's decision making to attend PNC were statistically significant to the outcome variable. [Table 7] And after entering the above variables to the multivariate logistic regression model, maternal education, mothers attitude on the importance postnatal care utilization, mothers who delivered at health facility that provides counseling/ advice to follow postnatal care and women's self decision making to attend post natal care were the factors associated with post natal care utilization. [Table 7] Mothers who were unable to read and write were 86% less

likely utilize post natal care follow up as compared to mothers education college level and above [AOR=0.142, 95% CI:(0.021-0.970)]. Mothers who agreed the importance of postnatal care utilization were 7.5 times more likely to utilize post natal care as compared to mothers who are not sure whether postnatal care was importance or not [AOR=7.5, 95% CI:(1.121-50.065)]. [Table 7] Mothers who give birth at health institution that have not received counseling/advice to come back to follow postnatal care were 88% less likely utilize post natal care follow up as compare those who give birth at health institution that provides counseling/advice to come back to follow postnatal care check up [AOR=0.116, 95% CI:(0.046-.294)]. Those mothers who were not decided themselves to follow post natal care were 73% less likely to utilize post natal care follow up as compare to those who decided themselves to follow post natal care [AOR=0.274, 95% CI:(0.105-0.714)]. [Table 7]

**Table 7. Final models of multivariate analysis on factors associated with post natal care utilization in Abi-Adi town 2013**

Variables		COR (95% CI)	AOR (95% CI)	P-value
<b>Maternal education</b>	Non educated	13.491(4.72-38.577)	.142(.021-.970)	0.046*
	Grade 1-8	2.7(.919-7.97)	.235 (.052-1.072)	0.061
	Grade 9-12	1.674(.544-5.154)	.281(.067-1.174)	0.082
	College and above	1	1	

<b>Importance of PNC</b>	Disagree	4.385(2.017-9.536)	0.737(.185-2.927)	0.664
	Agree	2.056(.731-5.781)	7.492(1.121-50.06)	0.038*
	Not sure	1	1	
<b>Counseling to follow PNC</b>	No	0.091(0.045-0.184)	0.116(0.046-0.294)	0.001**
	Yes	1	1	
<b>Self decision to attend PNC</b>	No	0.284(0.151-0.534)	0.274(0.105-0.714)	0.008**
	Yes	1	1	

#### 4. Discussion

This study tried to assess factors associated with utilization of postnatal care follow up among mothers give birth in Abi-Adi town, Tigray, North Ethiopia. The result of this study indicates that the level of postnatal care utilization in the town is very low (11.9%). Studies conducted in Palestinian, Nepal and Uganda revealed that the post natal care utilization was 30%, 34% and 58% respectively; which were relatively higher as compared to the current study [18, 19, 13]. In contrast the result of the present study was higher than EDHS 2011 (8%) [20] and study carried out in North West Gondar (6.3%) [21]. studies conducted in Sub-Saharan Africa (13%) [5], Bangladesh (16.6%) [22] and rural Indian (16%) [23] were in line with this study. The possible reason for this low prevalence rate of post natal care utilization might have been due low maternal education, low income, lack information about postnatal care, low maternal knowledge on danger sign and symptom of PNC, low attention of midwifery and other health professionals to counsel/advise mothers who deliver in health institution to come back for postnatal care, low maternal attitude on importance of PNC and low maternal decision making power at house hold level. Different studies have identified a range of risk factors associated with postnatal care utilization. However, the finding of this study identified that educational status, maternal attitude on importance of postnatal care utilization, mothers who delivered at health facility that provides advice to follow postnatal care and women's self decision making to attend post natal care were factors associated with post natal care utilization. Maternal education is one of the predictor

variables of postnatal care utilization in this study. Mothers who were unable to read and write were 86% less likely utilize post natal care as compared to the mother's college and above in education. This study is in agreement to the studies conducted in Addis Ababa [24], EDHS 2011 [20], Uganda [19], Palestinian [18] and study done by USAID (in fourteen countries) [14] shows that mothers who have higher education were associated with greater likelihood of receiving postnatal care and illiterate (unable to read and write) mothers were associated with less likelihood of receiving postnatal care. Education is likely to enhance female autonomy so that women develop greater confidence and capability to make decisions about their own health. It is also likely that educated women seek out higher quality services and have greater ability to use health care inputs that offer better care [24]. This is so because mothers who are literate have an opportunity to participate in different social and economical positions, decision making and women's empowerment. Also education helps to increases mothers attitude or awareness and increase acceptance of new idea and provides better education to other mothers regarding post natal care utilization including their children than those who low educational level. The other predictor variable for postnatal care utilization was women's attitude towards the importance of post natal care utilization. Mothers who agreed on the importance of postnatal care utilization were 7.5 times more likely to utilize postnatal care as compared to mothers who not don't agree on the importance of PNC. This finding is in line with studies conducted in Malawi [25] and Palestinian [22]. The possible explanation is due to good maternal knowledge on the importance PNC,

high maternal education, good maternal income, adequate information distribution about postnatal care and proper counseling offered from health professionals to mothers to come back for postnatal care after skilled delivery. Not providing counseling to come back mothers for postnatal care follow up is other predictor variable that affects postnatal care utilization in this study area. Mothers who delivered at health institution were not received counseling to come back for postnatal care follow up were 88% less likely utilizes postnatal care as compare to those who provides counseling to come back for postnatal care. This finding is in agreement with studies conducted in Malawi [25] and rural Uttar Pradesh [23]. The possible reasons for the low counseling of health professionals to return back mothers for postnatal care follow up may be low attention of health professionals, health managers, policy makers towards postnatal care follow up programs and also poor monitoring and evaluation inside the health institution. The other factor that significantly associated with postnatal care utilization was low maternal decision making power at house hold level. Mothers who don't decided themselves to follow post natal care were 73% less likely to utilize post natal care follow up as compare to those who decided themselves. This result is in line with studies conducted by USAID in Burkina Faso [14]. The possible explanation to this low women's decision making towards postnatal care utilization might have been due to low women's autonomy, gender inequality, low maternal confidence in decision making, low maternal knowledge, low education level and low maternal information about post natal care follow up. Women's decision making in the household level, social affairs and maternal health care is very important for maternal mortality reduction. Involving women in decision making enhances the prospects of post natal care follow up movements. In addition to the significant contribution of our findings for testing and counseling HIV, the study has limitations. It is cross-sectional study and did not show temporal relationship. The other limitation is that results did not generalize to rural areas. The study also has some strength. The study is community based study and primary data was used for analysis. In conclusion, the study revealed that postnatal care utilization (11.9%) is very low and low maternal education level, low maternal attitude on the importance of postnatal care and women's self decision making to attend post natal care were the factors associated with

postnatal care utilization. Health care providers were not counseled to mothers during ANC follow up, delivery and other service. There is a little information and less practice of postnatal care follow up in the community. Maternal educational, awareness and knowledge creation on postnatal care for women's should be strengthening. Health professionals should provide proper information and counseling to mothers during ANC follow up and delivery service. Monitoring and evaluation inside the health institution with strong integration of all maternal health care services should be strengthening. In women's empowerment still there are problems especially at the house hold level that needs follow up and integration women's association with youth and farmers association to improve and to solve the husband influence on women's at house hold level.

#### **Competing interests**

The authors declare that they have no competing interests.

#### **Authors' contributions**

HA designed the study, performed the statistical analysis and participated in drafting the manuscript. HA participated in the study design, implementation of the study, and drafted the manuscript. YA participated in the study design, implementation of the study, and participated in drafting the manuscript. All authors contributed to the data analysis, read and approved the final manuscript.

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