

**ORIGINAL ARTICLE****Challenges of PMTCT Service Utilization in Amhara Region: A Comparative Cross-sectional Study****Berhanu Elfu Feleke<sup>1</sup>, Belaynew Wasie<sup>2\*</sup>****OPEN ACCESS**

**Citation:** Berhanu Elfu Feleke, Belaynew Wasie. Challenges of PMTCT Service Utilization in Amhara Region: A Comparative Cross-sectional Study. *Ethiop J Sci.* 2018;28(6):779. doi:<http://dx.doi.org/10.4314/ejhs.v28i6.13>

**Received:** December 19, 2017

**Accepted:** May 11, 2018

**Published:** November 1, 2018

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**Funding:** Cost of the research work was supported by Bahir Dar university

**Competing Interests:** The authors declare that this manuscript was approved by all authors in its form and that no competing interest exists.

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**ABSTRACT**

**BACKGROUND:** Globally, 370,000 children became newly infected with HIV and an estimated 42,000-60,000 pregnant woman died because of HIV annually. Pediatric HIV infection in 90% of the cases was acquired from their mothers.

**METHODS:** Comparative cross-sectional study design was implemented. Epi-info software was used to calculate the sample size, and the estimated sample size was 2667 pregnant women. Data were collected using exit interview technique. Descriptive statistical techniques were used to identify the prevalence of PMTCT service utilization and binary logistic regression was used to identify the determinants of PMTCT service utilization.

**RESULTS:** A total of 2615 respondents were included for a response rate of 98.05%. Only 61.3% of the pregnant women attending ANC in the health facility were utilizing PMTCT services [95% CI: 59 %-63 %]. Around 3.22% of tested pregnant women did not receive their result. PMTCT service utilization was affected by knowledge of PMTCT [AOR 1.87, 95 % CI: 1.53-2.28], residence [AOR 0.67, 95 % CI: 0.51-0.89], internal referral system [AOR 3.06, 95% CI: 2.51-3.72], health professional client interaction [AOR 2.18, 95% CI: 1.75-2.76], fear [AOR 1.23, 95% CI: 1.03-1.47], long waiting time [AOR 0.74, 95% CI: 0.58-0.94], number of ANC visit [AOR 1.79, 95% CI: 1.4-2.29], gravidity [AOR 0.55, 95% CI: 0.46-0.66], educational status [AOR 1.43, 95% CI: 1.04-1.96] and involvement in PMTCT services [AOR 2.57, 95% CI: 1.51-4.4].

**CONCLUSION:** PMTCT service utilization was low in the study area. The presence of internal referral system significantly increases PMTCT service utilization.

**KEYWORDS:** PMTCT, Service, Utilization, Determinants, Amhara Region

**INTRODUCTION**

Mother to child transmission of HIV/AIDS was among mechanism of infecting the new born. Without any intervention, one-third of the child born from HIV infected women will receive the virus. This transmission may occur during pregnancy, labor and delivery or breast-feeding (1).

Globally, 370,000 children became newly infected with HIV and an estimated 42,000-60,000 pregnant woman died because of HIV per year (2). Sub-Saharan Africa constitute 68% of the world HIV infected population (1). In Ethiopia, 2.1% of the population was infected with HIV/AIDS. The prevalence of HIV among ANC client was 2.03% (3, 4). Mother-to-child transmission of HIV contribute to 90% pediatric HIV infection(5, 6).

In Amhara Region, the prevalence of HIV/AIDS among women of reproductive age group was 2.2%. Counseling and testing for HIV/AIDS was given only for 10.3% of pregnant women (6, 7). PMTCT service utilization was affected by stigma and discrimination, educational status, income, delayed PMTCT visit, unknown partner sero-status, the number of ANC visit already accomplished, delayed counseling, fear, interaction with health personnel, bad obstetric history, gravidity, knowledge regarding PMTCT, involvement in PMTCT service, referral procedures (6-18).

In Ethiopia, prevention of mother-to-child transmission of HIV service coverage increased by 5.16% annually, but the utilization of PMTCT service was less than 11%. Every working day, 326 mothers present themselves to ANC missed for HIV testing (19). With all PMTCT service interventions, mother-to-child transmission of HIV can be decreased as low as 1% (20, 21). However around 90 % of pregnant women were not utilizing PMTCT services.

This study will examine the reason why pregnant women fail to use PMTCT services. Decision maker can get valuable evidence to plan effective PMTCT service interventions. The objectives of this study was to estimate the prevalence and determinants of PMTCT service utilization among ANC attendants in resource limited settings.

## **METHODS AND MATERIALS**

Institution-based comparative cross-sectional study was conducted in the urban and rural setting of Amhara Region. The study was conducted in Bahir Dar City (urban) and Achefer woreda (rural). Bahir Dar City is the capital of Amhara

Regional State located at the geographical coordinates of 11° 38' north latitudes and 37° 15' east longitudes. Achefer Woreda was divided into the Semen and Debube woredas. Semen Achefer Woreda contains 26 kebeles and 7 health centers. Debube Achefer Woreda contains 7 health centers and 20 Kebeles.

The sample size was calculated using Epi-info software with the assumption of 95% Confidence interval, rural to an urban ratio of 2, a power of 85%, 50% proportion of PMTCT service utilization in the rural area, an odds ratio of 1.5 and design effect of 2 giving an estimated 2667 pregnant women.

First, we selected the health centers using simple random sampling technique. Bahir Dar City contains 10 health centers and 5 health centers were selected, respectively, by lottery method. From Semen and Debube Achefer, 7 health centers were selected from the total of 14 health centers using simple random sampling technique. Women coming for ANC visit were selected for exit interview using systematic random sampling technique.

Pregnant women who presented themselves to health institution for ANC visit were included. Pregnant women who were unable to communicate properly were excluded.

The data were collected using exit interview. Clients were interviewed by using structured questionnaire. The data were collected by 15 nurses and supervised by 5 health officers. To ensure the quality of this work, the questionnaire was prepared in English and then translated into Amharic (local language) and then back translated to English to check its consistency. Training was given to the data collectors and supervisors. Pretest was conducted on 5% of the samples and necessary corrections were made on the questionnaire. The whole data collection process was closely supervised. Data were collected from January 17/2015- April 28/2015.

Data were entered into to the computer using Epi-info software version 7 and transferred to SPSS version 20 for analysis. Descriptive statistical techniques were used to identify the prevalence of PMTCT service utilization. Binary logistic regression with AOR (adjusted odds ratio)

and their 95% CI were used to identify the predictors of PMTCT service utilization.

Ethical clearance was obtained from Amhara National Regional State Health Bureau Ethical Review Committee and Bahir Dar University CMHS (college of medicine and health science) Ethical Committee. Official permission was obtained from each health institution. The purpose of the study was explained for all the study participants. Each study participant's right to withdraw from the study at any point was

respected. The confidentiality of the data was kept at all stages. Written informed consent was obtained from each participant.

## RESULTS

A total of 2615 pregnant women were included in the study giving a response rate of 98.05%. The average age of the respondents was 24.31 years [SD (standard deviation) 6.83 years]. During the time of interview, 73.8% of the respondents had only one antenatal care visit (Table 1).

Table 1: Population profile of the study participants (n=2615).

<i>Variable</i>		<i>Frequency</i>	<i>Percentage</i>
<i>ANC visit</i>	1	1931	73.8
	2	507	19.4
	3	66	2.5
	4	111	4.2
<i>Residence</i>	Rural	1732	66.2
	Urban	883	33.8
<i>Educational status</i>	Unable to read and write	266	10.2
	Elementary education	1709	65.4
	Secondary education	171	6.5
	Higher education	469	17.9
<i>Average monthly income</i>	<500 birr	1801	69.1
	500-1000 birr	316	12.1
	1001-1500 birr	302	11.5
	1501-2000 birr	103	3.9
	>2000 birr	172	6.6
<i>Partner occupation</i>	Farmer	374	14.3
	Merchant	1172	44.8
	Government employ	953	36.4
	NGO employ	116	4.4
<i>Marital status</i>	Single	2	0.1
	Married	2603	99.5
	Divorced	7	0.3
	Widowed	3	0.1
<i>Occupation</i>	House wife	1912	73.1
	Government employ	400	15.3
	Merchant	99	3.8
	NGO employ	66	2.5
	Farmer	116	4.4
	Others	22	0.8

**Utilization of PMTCT service:** The overall prevalence of PMTCT service utilization among ANC attendants was 61.3 % [95% CI: 59 %-63 %]; 38.7 % of ANC attending pregnant women were not utilizing PMTCT services. Around

3.22% of tested pregnant women did not receive their result. Only 30.11% of the mothers had disclosed their result to their partner. Around 50% of the pregnant women did not have knowledge regarding PMTCT. More than half (55.5%) of the

pregnant mothers did not start ANC at proper time. Around 31.3% of the pregnant women did not remember their LMP (last menstrual period). After adjusting for residence, knowledge of PMTCT, health facility internal referral system, waiting time, interaction with health professionals, knowledge of partner status, partner involvement, history of bad obstetric outcome, fear, number of ANC visit, educational status, occupation, average monthly income, gravidity and age and PMTCT service utilization were associated with knowledge of partner sero status, residence, health facility internal referral system, interaction with health professional, waiting time, fear, number of ANC visit, gravidity, educational status, involvement in PMTCT service.

The odds of PMTCT service utilization among PMTCT knowledgeable women were 1.87 times higher than non-knowledgeable pregnant women [AOR 1.87, 95 % CI: 1.53-2.28]. The odds of PMTCT service utilization was 33% higher among rural pregnant women [AOR 0.67, 95 % CI: 0.51-0.89]. The presence of internal referral system within the health facility increases utilization of PMTCT services by 3.06 folds

[AOR 3.06, 95% CI: 2.51-3.72]. In the presence of good health professional client interaction, the odds of PMTCT service utilization increased by 2.18 folds [AOR 2.18, 95% CI: 1.75-2.76]. Around 41% of pregnant women fear about HIV/AIDS. Fear increases PMTCT service utilization by 1.23 times higher [AOR 1.23, 95% CI: 1.03-1.47]. Long waiting hour inside health facility decreases the utilization of PMTCT service by 26 % [AOR 0.74, 95% CI: 0.58-0.94]. Pregnant women who had more than one ANC visit were 1.79 times more likely to use PMTCT services as compared to women with only one ANC visit [AOR 1.79, 95% CI: 1.4-2.29]. The odds of PMTCT service utilization among multi-gravid women were 45% higher than primi-gravid women [AOR 0.55, 95% CI: 0.46-0.66]. The odds of PMTCT service utilization among women having diploma and above educational status was 1.43 times. [AOR 1.43, 95% CI: 1.04 - 1.96]. Only 4.44 % of women were involved in PMTCT service intervention, involving women in PMTCT service increases the utilization of PMTCT service by 2.57 times [AOR 2.57, 95% CI: 1.51-4.4] (Table 2).

Table 2: Predictors of PMTCT service utilization in rural and urban area's (n=2615).

Variable		Utilization		COR [95 % CI]	AOR [95 % CI]	p-value
		Yes	No			
Knowledge of partner Sero status	Yes	465	227	1.42[1.17-1.71]	1.87 [ 1.53-2.28]	<0.01
	no	1137	786			
Residence	Urban	601	282	1.56[1.31-1.85]	0.67 [ 0.51-0.89]	<0.01
	Rural	1001	731			
Internal referral system	Available	1291	591	2.96 [2.48-3.55]	3.06 [ 2.51-3.72 ]	<0.01
	Not	311	422			
Interaction with health worker	Good	1210	662	1.64 [1.37-1.95]	2.18 [ 1.72-2.76]	<0.01
	Bad	392	351			
Waiting time	Long	984	616	1.03 [0.87-1.21]	0.74 [0.58-0.94]	0.02
	Not	618	397			
Fear	Yes	663	410	1.04[ 0.88-1.22]	1.23 [ 1.03-1.47]	0.02
	No	939	603			
Number of ANC	More than 1	504	180	2.12 [1.74-2.59]	1.79 [ 1.4-2.29]	<0.01
	1	1098	833			
Gravidity	Primi-gravid	530	496	0.52[0.44-0.61]	0.55 [ 0.46-0.66]	<0.01
	Multi-gravid	1072	517			
Educational status	Diploma and above	244	84	1.99 [1.52-2.6]	1.43 [1.04-1.96]	0.02
	Below diploma	1358	929			
Involvement in PMTCT service	Yes	97	19	3.37 [2-5.73]	2.57 [ 1.51- 4.4]	<0.01
	No	1505	994			

**PMTCT service utilization in rural area:** Utilization of PMTCT service among ANC attendants in rural area was 57.8 % [95 % CI: 55 %-60%]. PMTCT service utilization in rural area was affected by knowledge of partner sero-status,

starting ANC visit at proper time, the presence of internal referral system in the health facility, good interaction with health care personnel, waiting hour, number of ANC visit, gravidity and occupation of the women (Table 3).

Table 3: Determinants of PMTCT service utilization in rural area (n=1732)

Variable		Utilization		COR [95 % CI]	AOR [95 % CI]	p-value
		Yes	No			
Knowledge of partner Sero status	Yes	350	180	1.65[1.32-2.05]	2.58[2.01-3.3]	<0.01
	No	651	551			
Fist ANC date	Proper	250	224	0.75 [0.61-0.94]	1.4 [1.07-1.84]	0.02
	Not proper	751	507			
Internal referral system	Available	729	346	2.98 [2.43-3.67]	4.14 [3.29-5.22]	<0.01
	Not	272	385			
Interaction with health worker	Good	616	382	1.46 [1.2-1.78]	2.41 [1.87-3.12]	<0.01
	Bad	385	349			
Waiting time	Long	390	336	0.75 [0.62-0.91]	0.68 [0.52-0.88]	0.02
	Not	611	395			
Number of ANC	More than 1	139	30	3.77 [2.47-5.78]	4.48 [2.81-7.43]	<0.01
	Only 1	862	701			
Gravidity	Primi-gravid	339	344	0.58 [0.47-0.7]	0.43[0.33-0.56]	<0.01
	Multi-gravid	662	387			
Occupation of women	Others	35	2	13.21 [3.09-79.63]	10.6 [2.3-48.34]	0.02
	House wife	966	729			

**PMTCT service utilization in urban area:** Utilization of PMTCT services among ANC attendants in urban area was 68.1% [95 % CI: 65 %-71%]. Utilization of PMTCT service in urban

area was affected by the presence of internal referral system in the health facility, knowledge of PMTCT, gravidity and involvement in PMTCT service (Table 4).

Table 4: Determinants of PMTCT service utilization in urban area (n=883).

Variable		Utilization		COR [95 % CI]	AOR [95 % CI]	p-value
		Yes	No			
Internal referral system	Available	562	245	0.86 [0.56-1.31]	2.12[1.27-3.56]	<0.01
	Not	99	37			
Knowledge on PMTCT	Knowledgeable	462	168	2.26 [1.64-3.09]	2.15 [1.51-3.06]	<0.01
	Not Knowledgeable	139	114			
Gravidity	Primi-gravid	191	152	0.4 [0.29-0.54]	0.52 [0.38-0.72]	<0.01
	Multi-gravid	410	130			
Involvement in PMTCT service	Involved	71	17	2.09 [1.17-3.76]	2.76 [1.49-5.13]	<0.01
	Not involved	530	265			

## DISCUSSION

Utilization of PMTCT service among pregnant women attending ANC was 61.3 % [95% CI: 59% - 63 %]. A significant proportion of pregnant

women (38.7 %) attending ANC in the health facility were missed for PMTCT service. This finding was higher than the Ethiopian demographic and health surveillance report (EDHS) of 2016(22). This is because this research

is a health facility-based study where the denominators are ANC attendants whereas the EDHS 2011 report was a community-based study where the denominator was all pregnant women in the community.

Only 30.11% of the pregnant women disclosed their result to their partner. This indicates that pregnant women were not freely discussing the issue of HIV to their partner. The odds of PMTCT service utilization among PMTCT knowledgeable pregnant women were 1.87 times higher than non-knowledgeable pregnant women [AOR 1.87, 95 % CI: 1.53-2.28]. This finding agrees with 2013 world health organization (WHO) report. This is due to the reason that if they know the advantage of PMTCT service, their awareness and willingness to use the service becomes high. Additionally, if they have knowledge on PMTCT they will care for their newborn's health so they try to avoid the risk of mother-to-child transmission by using PMTCT services (23). The odds of PMTCT service utilization in rural women were 33% higher than the urban women [AOR 0.67, 95 % CI: 0.51-0.89]. This might be due to the reason that in the urban area women afraid the stigma and discrimination associated with HIV testing in the nearby health facility, so they prefer to take HIV testing outside their catchment areas. Additionally, in the urban area, health professionals suffer from huge workload so they may not implement proper counseling and testing of PMTCT.

The presence of internal referral system inside health facility increases the utilization of PMTCT service by 3.06 folds [AOR 3.06, 95% CI: 2.51 -3.72]. This finding agrees with the finding from Kenya (15). This is because in the third world countries like Ethiopia, most of pregnant women had low educational status, so they did not know where to go to get the proper service after they receive their test result. Additionally, internal referral system links all tested pregnant women to the next service. Good interaction between pregnant women and health personnel increases the utilization of PMTCT service by 2.18 folds [AOR 2.18, 95% CI: 1.75-2.76]. This finding agrees with findings from

Rwanda and Uganda (13, 24). This is because good interaction increases the level of trust between health personnel and pregnant women (18). Fear about the impact of HIV/AIDS increases the utilization of PMTCT service by 1.23 folds higher [AOR 1.23, 95% CI: 1.03-1.47]. This is because mothers care about the health of their newborn. They did what they can to get their child free from HIV. Long waiting hour decreases the utilization of PMTCT service by 26% lower [AOR 0.74, 95% CI: 0.58-0.94]. This finding was in line with the findings from Nazareth in Ethiopia and a 2013 WHO report (16, 18). This is because long waiting hour makes the pregnant women dislike the health facility services and create suboptimal health professionals client interaction. The number of ANC visit already accomplished significantly affects the utilization of PMTCT service, pregnant women that had more than 1 ANC visit already accomplished were 1.79 times more likely to use PMTCT services than women that had only one ANC visit [AOR 1.79, 95% CI: 1.4-2.29]. This finding agrees with findings from Burkina Faso and Rwanda (11, 12). This is because the fact that as the number of ANC visit increases, clients were more likely to get compressive HIV education and more likely to care about the health of their child and themselves (15).

The odds of PMTCT service utilization in multi-gravid women was 45% higher than primi-gravid women [AOR 0.55, 95% CI: 0.46-0.66]. This is because of the fact that those multi-gravid women had exposed themselves to repeated number of counseling and testing for HIV/ AIDS for their previous pregnancy so they are more aware of PMTCT services advantages. Women's education benefits a lot for PMTCT service utilization, the odds of PMTCT service utilization among women with educational status of diploma and above was 1.43 times higher [AOR 1.43, 95% CI: 1.04-1.96]. This finding agrees with findings from India, Rwanda, and Uganda (9, 12, 24). This is because educational status increases the adherence of women to health facility services; their knowledge regarding PMTCT will increase as their educational status increases. Involving women in PMTCT services increases the

utilization of PMTCT services by 2.57 folds higher [AOR 2.57, 95% CI: 1.51 - 4.4]. This finding agrees with findings from Nazareth and Mekele, Ethiopia (16, 17). This is because the community's awareness about PMTCT service will be enhanced by involving them in the planning, implementing and evaluating the PMTCT service program.

The significant proportion of pregnant women attending ANC was missed for PMTCT service utilization. Good knowledge regarding PMTCT, the presence of internal referral system, good health professional-to-client interaction, fear and ANC visit more than one increase the PMTCT service utilization. Urban residents, long waiting hour and primi-gravidity negatively affect PMTCT service utilization.

Every health facility should have an internal referral system. Any PMTCT intervention should involve the community in its planning, implementation and evaluation stage. Emphasis should be given to the urban area health facilities about PMTCT service implementation.

#### ACKNOWLEDGEMENTS

We would like to acknowledge the University of Bahir Dar College of Medicine and Health Science for financially sponsoring this research. We would also like to acknowledge the Amhara Regional State Health Bureau for giving the necessary information.

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