

Knowledge, Attitude, Practice and Factors Associated with Prevention of Mother-to-Child Transmission of HIV/AIDS among Pregnant Mothers Attending Antenatal Clinic in Hawassa Referral Hospital, South Ethiopia

Amanuel A Abajobir^{1*} and Agegnehu B Zeleke²

¹School of Public Health, Debremarkos University, Debremarkos, Ethiopia

²Southern Nations Health Bureau, Hawassa, Ethiopia

Abstract

Background: Better knowledge of, good attitude towards and practicing prevention of mother-to-child transmission is highly effective intervention and has an enormous potential to improve both maternal and child health. Hence, this study tried to assess the knowledge, attitude, practice and factors associated with prevention of mother-to-child transmission of HIV/AIDS among pregnant mothers attending antenatal clinic.

Methods: An institution-based cross-sectional study was conducted among pregnant mothers attending antenatal care clinic at Hawassa University Referral Hospital in 2012. A systematic random sampling technique was used to select 238 antenatal care attendees. Data were collected through structured pre-tested questionnaire. The data were entered into Epi Info and analyzed by using SPSS software for windows. Univariate, bivariate and multivariate analyses were done.

Results: More than four-fifth (82.3%) mothers knew about prevention of mother-to-child transmission of HIV and 97.4% had good attitude towards it. Only about half (48.3%) of the respondents knew that antiretroviral drugs given for seropositive pregnant mothers could reduce the risk of transmission. Urbanite mothers were more knowledgeable than their rural counter parts (AOR=2.63, 95%CI (2.5, 5.31)). The odds of knowledge on prevention of mother-to-child transmission was about 3 times higher among multipara (AOR=2.64, 95%CI (2.02, 5.38)). It was also higher among women having their antenatal follow up for the current pregnancy (AOR=6.2, 95%CI (1.15, 9.44)). About 96% of mothers have been tested for HIV and the rest did not test due mainly to fear of stigma, discrimination and lack of confidentiality. Health Center delivery (AOR=1.2, 95%CI (1.73, 3.25)) and antenatal care visit of four and above for the current pregnancy (AOR=1.04, 95% CI (1.01, 2.49)) found to have statistically significant association.

Conclusion: Women's empowerment, improving antenatal care services and male involvement were significant predictors of knowledge, attitude and uptake of prevention of mother-to-child transmission services and should be promoted through community mobilization.

Keywords: Mother-to-child transmission of HIV/AIDS; Knowledge; Attitude; Practice

Introduction

Mother-to-child transmission (MTCT) of human immune deficiency virus (HIV) infection is the transmission of the virus from an HIV-infected mother to her child during pregnancy, labor, delivery or breastfeeding [1,2]. More than 90% of children were infected through MTCT of which nearly 90% occurred in sub Saharan Africa. Approximately half of them die before their second birth day if there is no appropriate treatment [3].

Significant improvements have been demonstrated in other regions. One important reason for the improvement of coverage is that HIV testing among pregnant women is increasing with the expansion of provider-initiated testing and counseling in antenatal clinics, labor and delivery centers and other healthcare settings. In 2008, for instance, an estimated 21% of pregnant women giving birth in low- and middle-income countries were tested for HIV [4].

In sub-Saharan Africa, antiretroviral (ARVs) coverage increased from 17% to 28%. Yet, despite recent progress, much work remains to be done. For instance, in 2008 an estimated 430,000 children were newly infected with HIV, nearly all of them through MTCT. Even in countries that are rapidly scaling-up PMTCT services, the major challenge is to provide more effective ARV interventions, including the provision of antiretroviral treatment (ART) for pregnant women and

mothers eligible for treatment and to demonstrate the impact of these interventions by a decrease in pediatric infections, HIV-free survival and improved maternal and child health [5].

To prevent the transmission of HIV from mother to baby, World Health Organization (WHO) promotes a comprehensive strategic approach that includes four components: the prevention of new infections in parents, avoiding unwanted pregnancies in HIV infected women, preventing transmission of HIV from an infected mother to her infant and care, treatment & support for mothers living with HIV, their children and families. It primarily includes the provision of antiretroviral prophylaxis to the mother to reduce the risk of MTCT through rigorous PMTCT program [6].

***Corresponding author:** Amanuel A Abajobir, School of Public Health, Debremarkos University, P.O. Box: 269, Debremarkos, Ethiopia, E-mail: amanuel_alemu@yahoo.com

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Vertical transmission from mother-to-child accounts for more than 90% of pediatric AIDS. Particularly in developing countries including Ethiopia, MTCT has become a critical child health problem and created enormous social and economic problems [6].

The reasons for an increasing MTCT of HIV might include lack of knowledge of mothers on the risk of MTCT, benefits of preventive interventions, such as prophylactic ARV drugs and infant feeding options [7].

The prevention of MTCT plays a major role in limiting the number of children being infected by HIV. Without any intervention, 20-50% of infant would be infected; 5-10% during pregnancy, 10-20% during labor and delivery and 5-20% through breast feeding. By implementing PMTCT program, the overall risk can be reduced to less than 2% [8].

According to EDHS 2011 only 34% of mothers had ANC follow up in Ethiopia [9] thus having a negative contribution on under-utilization of PMTCT services. Better knowledge of, good attitude towards and practicing PMTCT is highly effective intervention and has an enormous potential to improve both maternal and child health. This study provided baseline information about the knowledge, attitude, practice and factors affecting PMTCT services among pregnant mothers. It would also be a significant venture in promoting effective relationship between the healthcare team and the client thereby facilitating quality and efficient healthcare services to reduce mortality and morbidity of children as well as mothers.

Moreover, the results of this study would help healthcare institutions to recognize mother's knowledge, attitude and utilization of PMTCT services and hence benefit them by providing accurate information on risk of MTCT, availability of prevention options, effect of HIV on pregnancy outcomes and involvement and screening of partner to improve quality care and utility of the services.

Methods

Study design, area and period

An institution-based cross-sectional study was conducted in ANC clinic of Hawassa University Referral Hospital, South Ethiopia, in 2012. All pregnant mothers who were attending ANC clinic were included while severely ill pregnant mothers were excluded.

Sampling

The sample size was calculated using single population proportion formula with estimated proportion of 10% (0.1) vertical transmission (MTCT) of HIV, according to Ethiopian SPM II [10] assuming that marginal error and 10% non-respondent rate respectively; accordingly, it was 238. ANC follow up logbook was used to systematically select 238 eligible pregnant mothers attending the clinic.

Data collection

Pre-tested structured questionnaire was prepared by reviewing previously done studies on the topic of interest [11-16]. The data were collected using structured interviewer administered questionnaire prepared to address knowledge, attitude, practice and factors associated with PMTCT services. The questionnaires were administered to all volunteer pregnant women who fulfilled the inclusion criteria while they were attending ANC clinic at the hospital. The pregnant women were interviewed by midwives who were trained as data collectors.

Data quality control

One day training was given for four data collectors about the

objectives and procedures of the data collection by the investigators. Questionnaire was pre-tested to assess clarity, understandability, flow and consistency. Data completeness and consistency was checked by the investigators. Data cleaning and editing took place; missed values were statistically handled to help address concerns caused by incomplete data using SPSS statistical package.

Data analysis

Data entry, coding and analysis were performed using SPSS version 20 software package. To explain the study population in relation to relevant variables, frequencies, percents and summary statistics were used. Associations between dependent and independent variables were assessed by using binary and multiple logistic regressions. To measure internal consistency, reliability analysis was done. P-values less than 0.05 were considered to be statistically significant in all cases.

Ethical consideration

Ethical approval and clearance was taken from institutional review board of College of Medicine and Health Sciences, Hawassa University. This study did not cost additional expenses on the study subjects. There were no potential risks that might cause any harm to study subjects. Information which was communicated with individual subjects was kept private and maintained confidential. Coding was used to eliminate names and other personal identification of respondents throughout the study process to ensure anonymity.

Results

Socio-demographic and socio-economic characteristics

A total of 232 women responded to the questionnaire, yielding a response rate of 97.5%. Most 92 (39.7%) of the women were within the age group of 25-29 years. The majority, 207 (89.2%), of the respondents were married at the time of the survey. Ninety (38.8%) respondents were protestant in religion followed by orthodox 83 (35.8%) and muslims 39 (16.6%).

A little more than one-fifth, 63 (27.3%), had attended primary, 61 (29.7%) secondary, 63 (27.2%) above secondary education respectively; however, 37 (15.9%) had no formal education.

Ninety two (39.7%) of the study participants were house wives and most 88 (39.8%) of husbands were government employees. One hundred eighty three (78.9%) of the respondents were from urban areas and the remaining 43 (21.1%) were from rural areas (Table 1).

Reproductive health history

Concerning the parity status of the women, 78 (42.4%) were para I, 96 (52.2%) multipara and the rest 10 (5.2%) were grand multipara. Most 157 (84.4%) of the women had ANC follow up during the last pregnancy. About one-third of the attendees, 73 (31.5%), had three ANC visits for the current pregnancy followed by two 69 (29.7%), four and above 65 (28%) and only one 25 (10.8%) visits respectively (Table 2). According to the respondents, 45 (24.3%) of the women delivered at home, 89 (48.1) in health centers, 45 (24.3%) in hospitals and 6 (3.2%) delivered at private clinics respectively (Figure 1).

Knowledge of women on mother-to-child transmission of HIV

This study tried to assess the knowledge of pregnant mothers attending ANC on MTCT of HIV. Accordingly, all of the respondents heard about HIV/AIDS. Among these, 209 (90.1%), of the pregnant mothers attending ANC clinic in Hawassa University Referral Hospital

Variables	Frequency (n=232)	%
Age		
15-19	6	2.6
20-24	33	14.2
25-29	92	39.7
30-34	54	23.3
35-39	39	16.8
40-44	8	3.4
Marital status		
Single	10	4.3
Married	207	89.2
Divorced	8	3.4
Widowed	7	3.0
Religion		
Protestant	90	38.8
Orthodox	83	35.8
Muslim	39	16.6
Other	20	8.6
Educational status		
No formal education Primary	37	15.9
Secondary	63	27.2
Above secondary	69	29.7
	63	27.2
Occupation		
Housewife	92	39.7
Government employed	67	28.9
Private employed	26	11.2
Merchant	31	13.4
Other	16	6.9
Husband's occupation		
Farmer	29	13.1
Government employed	88	39.8
Private employed	21	9.5
Merchant	66	29.9
Other	17	7.7
Address		
Rural	49	21.1
Urban	183	78.9

Table 1: Socio-demographic Characteristics of Pregnant Mothers Attending ANC Clinic in Hawassa University Referral Hospital, South Ethiopia, 2012.

Variables	Frequency (n=232)	%
Parity		
Para I	78	42.4
Multipara	96	52.2
Grandmultipara	10	5.4
ANC during last pregnancy		
Yes	157	84.4
No	29	15.6
Current ANC visit		
One	25	10.8
Two	69	29.7
Three	73	31.5
Four and above	65	28.0
Number of alive children		
One	81	45.0
Two	60	33.3
Three	20	11.1
Four	14	7.8
Five and above	5	2.8

Table 2: Reproductive History of Pregnant Mothers Attending ANC Clinic in Hawassa University Referral Hospital, South Ethiopia, 2012.

knew MTCT of HIV while the rest 23 (9.9%) did not know about it. Among the respondents, 178 (76.7%) knew that HIV screening could be done in health institutions and the rest 54 (23.3%) did not know where to be tested. As to the temporal relation of transmission of the virus from the infected mother to her child, 21 (10%) responded that it could be during ante partum, 19 (9.1%) intrapartum, 35 (16.7%) postpartum, 98 (46.9%) throughout the pregnancy and 36 (17.2%) did not know respectively (Figure 2).

Knowledge of women on prevention of mother-to-child transmission of HIV/AIDS

The study assessed the knowledge on PMTCT of HIV/AIDS of the pregnant mothers attending the hospital. Among the respondents, 192 (82.3%) knew PMTCT of HIV. Of these, 112 (48.3%) of the respondents knew ART drugs given for HIV-positive pregnant mothers could reduce the risk of HIV transmission. Majority of the respondents, 209 (90.1%), knew that a child from HIV-positive mother need follow up at ART clinic. Of the respondents, 29 (12.5%), said that a child need follow up for six months, 6 (2.6%) for one year and 174 (75%) until proven HIV-negative. Time of ART initiation has its own effect on its effectiveness. Accordingly, 60 (26.3%) of the respondents described the time of ART prophylaxis initiation for HIV-positive mother to be started at 14 weeks of pregnancy, followed by during early pregnancy by 15 (6.5%), after delivery by 3 (1.3%) and 152 (65.5%) did not know when to initiate it (Figure 3).

Association between socio-demographic characteristics and knowledge on MTCT of HIV

The bivariate and multivariate analyses revealed that age, marital status, religion and occupation of the respondents did not have significant association; however, women with secondary (AOR=1.05, 95%CI (1.20, 2.34)) and above secondary (AOR=1.4, 95%CI (1.07, 1.87)) education were more likely to know about MTCT of HIV respectively. Women whose husbands were government employees knew more about MTCT of the virus (AOR=1.67, 95%CI (1.19, 4.25)).

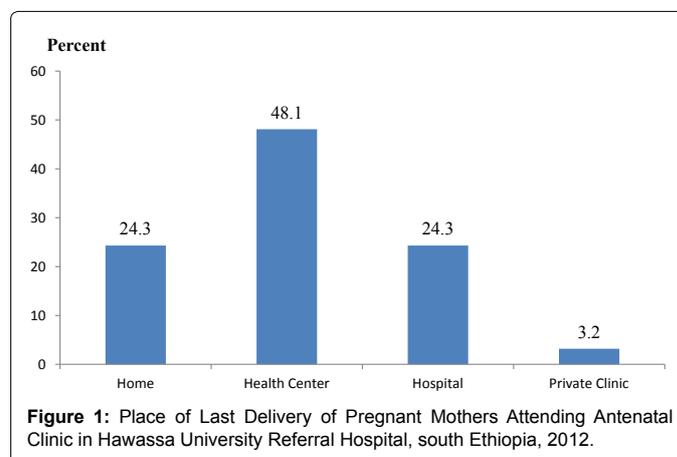


Figure 1: Place of Last Delivery of Pregnant Mothers Attending Antenatal Clinic in Hawassa University Referral Hospital, south Ethiopia, 2012.

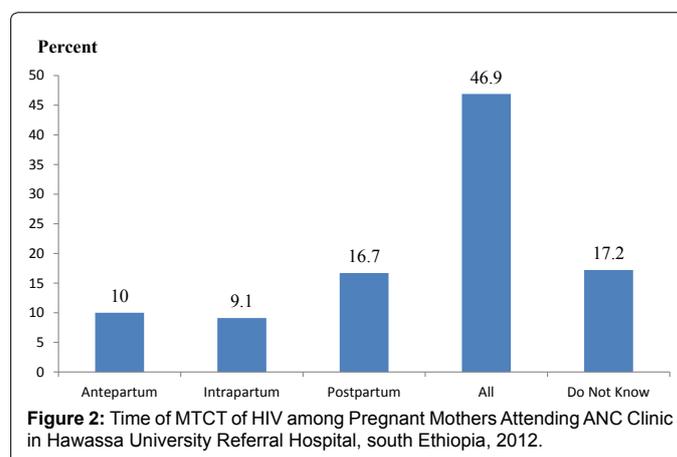


Figure 2: Time of MTCT of HIV among Pregnant Mothers Attending ANC Clinic in Hawassa University Referral Hospital, south Ethiopia, 2012.

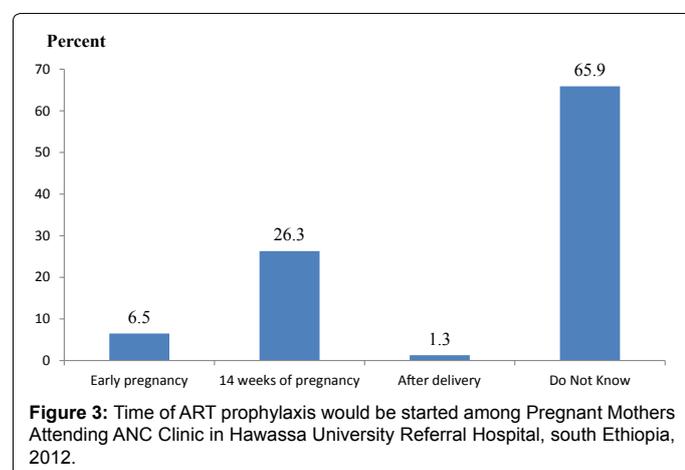
Moreover, urbanites had about three times more knowledge on MTCT than their rural counter parts (AOR=2.63, 95%CI (2.5, 5.31)) (Table 3).

Association between socio-demographic characteristics and knowledge of PMTCT of HIV

The bivariate and multivariate analyses shown that age, marital status, religion and occupation had no significant association with PMTCT knowledge; but women with secondary (AOR=6.86, 95%CI (2.3, 9.45) and above secondary (AOR=2.4, 95%CI (2.15, 4.31) education were more likely to know about PMTCT of HIV respectively. Urbanite women had more knowledge on PMTCT than their rural counter parts (AOR=1.04, 95%CI (1.19, 7.95).

Association between reproductive history and knowledge on MTCT of HIV

Moreover, reproductive characteristics of the women such as parity



status, ANC during last pregnancy, place of last delivery and number of ANC visits for the current pregnancy shown to have significant association with knowledge on MTCT of HIV; however, number of alive children and distance of health facility did not show significant association.

Multiparous women had about three times more knowledge on MTCT of HIV/AIDS (AOR=2.64 95%CI (2.02, 5.38). Antenatal care follow up during last pregnancy had positive association with MTCT knowledge of the women (AOR=1.85 95%CI (1.15, 4.55)). The odds of MTCT knowledge was six times higher among pregnant mothers having four and more ANC visits for the current pregnancy (AOR=6.2, 95%CI (1.15, 9.44). It was also higher among respondents having their ANC follow up for the current pregnancy (AOR=1.43, 95%CI (1.14, 4.44)).

Association between reproductive history and knowledge on PMTCT of HIV

Among the reproductive characteristics of women, multiparity and ANC follow up during last pregnancy shown to have significant association with knowledge on PMTCT of HIV/AIDS after controlling possible confounders. The odds of knowledge on PMTCT was about three times higher among multiparous women (AOR=2.64, 95%CI ((2.02, 5.38)) (Table 3).

Attitude towards PMTCT of HIV

Among the study subjects, 226 (97.4%) had good attitude toward PMTCT of HIV and the rest 6 (2.6%) had poor attitude. The bivariate and multivariate analysis shown that age, religion, marital status, educational status, occupation, practice toward PMTCT, knowledge on prevention of MTCT and knowledge on transmission had no significant association with the attitude of the pregnant mother;

Variables	Knowledge on MTCT		COR [95%CI]	AOR [95%CI]
	Yes	No		
Educational status				
No formal education	22	15	1	1
Primary	50	13	2.62 (1.07, 6.93)	1.25 (0.20, 7.87)
Secondary	64	5	8.72 (2.84, 12.8)	1.05 (1.20, 2.34)
Above secondary	55	8	4.68 (1.74, 12.61)	1.40 (1.07, 1.87)
Husband's occupation				
Farmer	14	15	1	1
Government employee	78	10	8.38 (3.13, 22.3)	1.67 (1.19, 4.25)
Private employee	19	2	10.17 (1.99, 15.7)	2.44 (0.27, 13.27)
Merchant	57	9	6.78 (2.46, 18.67)	1.36 (0.27, 16.76)
Other	15	2	8.03 (1.55, 41.64)	1.67 (0.19, 14.25)
Address				
Rural	29	20	1	1
Urban	162	21	5.32 (2.56, 7.02)	2.63 (2.5, 5.31)
Parity				
Para I	75	3	1	1
Multipara	70	26	3.28 (2.69, 6.04)	2.64 (2.02, 5.38)
Grandmultipara	8	2	6.25 (0.90, 43.14)	2.32 (0.18, 28.57)
ANC during last pregnancy				
Yes	137	20	4.18 (1.72, 10.2)	1.85 (1.15, 4.55)
No	18	11	1	1
Number of ANC visit for current				
One	17	8	1	1
Two	55	14	1.89 (0.06, 5.15)	1.36 (0.32, 5.70)
Three	61	12	2.39 (0.84, 6.79)	1.61 (0.33, 7.82)
Four and above	58	7	3.89 (1.23, 12.3)	6.2 (1.15, 9.44)

Adjusted for educational status, husband's occupation, address, parity, parity and ANC for the last and current pregnancy.

Table 3: Bivariate and Multivariate Analysis of Socio-demographic Characteristics and Knowledge on MTCT of HIV/AIDS of Pregnant Mothers Attending ANC Clinic in Hawassa University Referral Hospital, south Ethiopia, 2012.

however, urbanites had good attitude towards PMTCT than their rural counterparts (AOR=1.61, 95%CI (1.12,3.95).

Moreover, reproductive characteristics of the women such as parity, number of alive children, number of ANC visits for the current pregnancy and place of last delivery did not show significant association with attitude towards PMTCT. However, women who had ANC follow up during last pregnancy shown to have significant association with attitude towards PMTCT (AOR=2.60, 95%CI (2.4, 5.30) (Table 4).

Practices of PMTCT among women attending ANC clinic

Prevention of mother-to-child transmission and factors affecting its practice among women were assessed using different explanatory variables. Among the respondents, 223 (96.1%) have been tested for HIV. Among these, 52 (23.3%) tested three months ago, 13 (5.8%) tested six months ago, 41 (18.4%) tested one year ago and 117 (52.5%)

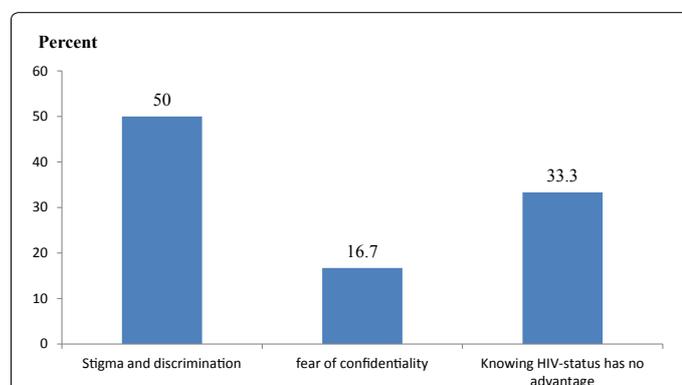


Figure 4: Reasons not to be tested among Pregnant Mothers Attending ANC clinic in Hawassa University Referral Hospital, south Ethiopia, 2012

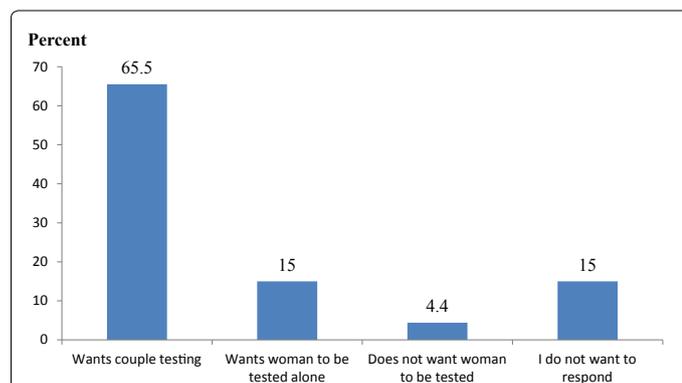


Figure 5: Perceptions of husbands on HIV screening among Pregnant Mothers Attending ANC clinic in Hawassa University Referral Hospital, south Ethiopia, 2012.

tested on the recent pregnancy. Majority of them, 207 (89.2%) and 205 (88.4%) had pre- and post-counseling services respectively. Among the respondents, 194 (83.6%) shared the result of HIV test with their husband/partner, 17 (7.3%) did not share it and 9 (3.9%) had no husband/partner at the time of testing. The rest (4.9%) did not test for fear of stigma and discrimination and lack of confidentiality (Figure 4).

Among the respondents, 122 (52.6%) of the partner/husband tested for HIV/AIDS during their ANC follow up. More than four-fifth, 148 (84.5%), had no any participation in community-conversation on HIV/AIDS. Among the respondents, 153 (67.7%) discussed about HIV/AIDS and 132 (56.9%) discussed about the issues of HIV testing in current pregnancy with their husband. Regarding the perception of their husband on HIV screening, 148 (63.8%) wanted to have couple testing, 34 (14.7%) wanted only the woman to be tested, 10 (4.3%) did not want to be tested either and the other 34 (14.7%) did not want to respond (Figure 5).

Association between socio-demographic characteristics and practices of PMTCT of HIV/AIDS

Bivariate and multivariate analyses shown that age, religion and occupation of the respondents did not show any significant association with their practice towards PMTCT; on the other hand, urban residents were three times more likely to practice HIV testing than their rural counterparts (AOR=2.90,95%CI (1.01,4.61)) (Table 5).

Association between reproductive characteristics and practice on PMTCT of HIV/AIDS

In order to understand the reproductive characteristics of women related to their PMTCT practice, a logistic regression analysis was done. Among the characteristics parity, ANC follow up during the last pregnancy and number of alive children did not have significant association; however, place of delivery being in health institution (AOR=1.2 95%CI (1.73, 3.25) and ANC visit of four times and above for the current pregnancy (AOR=1.04 95% CI (1.01, 2.49) found to have statistically significant association respectively. Moreover, bivariate and multivariate analysis of factors associated with practice of PMTCT was done. Accordingly discussion about HIV with partner, partner testing status during ANC and sharing idea about ART prophylaxis had no significant association but those participated in training/health education on PMTCT found to have been significantly practicing PMTCT (Table 5).

Discussion

For the achievement of Millennium Development Goals (MDGs), creating awareness and enhancing PMTCT practice has important role particularly in the reduction of childhood and maternal morbidity and mortality which in turn has enormous impact on socio-economic development of the country.

Variables	Attitude on PMTCT		COR [95%CI]	AOR [95%CI]
	Good	Poor		
Address				
Rural	47	2	1	1
Urban	179	4	1.73 (1.11, 4.89)	1.61 (1.12, 3.95)
ANC during last pregnancy				
Yes	153	4	1.34 (2.25,5.41)	2.60 (2.4, 5.30)
No	27	2	1	1

Adjusted for address and ANC during last pregnancy

Table 4: Bivariate and Multivariate Analysis of Socio-demographic Characteristics and Attitude towards PMTCT of Pregnant Mothers Attending ANC Clinic in Hawassa University Referral Hospital, south Ethiopia, 2012.

Variables	Practice Table 5on PMTCT		COR[95%CI]	AOR[95%CI]
	Yes	No		
Address				
Rural	43	6	1	1
Urban	178	4	5.08 (1.31,19.72)	2.9 (1.01,4.61)
Place of last delivery				
Home	39	6	1	1
Institutional delivery	136	3	2.72 (4.05, 5.96)	1.2 (1.73, 3.25)
Number of current ANC				
One	18	7	1	1
Two	67	1	1.3 (1.02,23.43)	1.71 (0.25,11.6)
Three	70	3	1.92 (0.32, 24.37)	3.4 (0.57,56.23)
Four and above	63	2	1.57 (1.80, 5.44)	1.04(1.01, 2.49)

Adjusted for address, place of last delivery and number of ANC visits for current pregnancy

Table 5: Bivariate and Multivariate Analysis of Socio-demographic Characteristics and Practice of PMTCT of Pregnant Mothers Attending ANC Clinic in Hawassa University Referral Hospital, south Ethiopia, 2012.

This study shown that majority of the antenatal attendees was within the age group of 25-34 years. According to EDHS 2011 national survey, the highest HIV prevalence was found in this age group (29-34 years) directing a focus on this segment of the population that is highly fertile for HIV prevention programmers in Ethiopia [9].

In this study, all of the respondents heard about HIV/AIDS. Among these, 90.1% of the pregnant mothers knew about transmission of HIV from infected mother to her child and 82.3% of the pregnant mothers knew that MTCT of HIV is preventable. This finding was nearly similar with the study in Addis Ababa at Tikur Anbessa and Zewuditu memorial hospitals which was 89.9% and 76.8% respectively [17]. This finding was greater than the study finding in Arbaminch hospital (Ethiopia) and in rural and urban Uganda in both of the cases 80% of mothers knew transmission of HIV to their offspring [11,14].

Educational status of the women shown significant association with knowledge on PMTCT of HIV in logistic regression. In Ethiopia, 53% of women with secondary or higher education have comprehensive knowledge about HIV/AIDS prevention and transmission. The population based survey in Zambia shown that among the highly educated people in age group 15-29, the prevalence of HIV decreased significantly while on the other hand HIV prevalence rose or remained stable among lower educated people. In the same study mothers who had education beyond primary school were almost three times more likely to report willingness to be tested for HIV compared to those who had not finished their primary school education or had not been educated at all [18]. This implies improvement in women's educational status enables them to have better knowledge on PMTCT that decreases infant mortality and improve their health.

Women who had ANC follow up during their last pregnancy show significant association with knowledge on PMTCT of HIV in the multivariate analysis. In 2011 EDHS, only 34% of pregnant mothers had ANC follow up [9]. This implies increasing pregnant women to have ANC seeking behavior enables them to have better knowledge on PMTCT.

In this study pregnant women whose partners were tested during the ANC follow up were 52.6%. Study done in Kenya found that the involvement of men decreased the risk of vertical transmission by 40%. In Rwanda, an estimated 81% of pregnant women who tested for HIV in 2010 had male partners who had tested in the last 12 months, many of whom received testing with their partners during the antenatal care process [10]. This implies increasing male involvement in ANC follow up would decrease vertical transmission of HIV that in turn reduces fetal mortality.

Women who had ANC follow up during their last pregnancy were more likely using PMTCT services. However, not all pregnant mothers had ANC follow up that makes uptake of PMTCT services more difficult [9]. A survey conducted in Zimbabwe on knowledge, attitude and practice to see the change in pregnant women's utilization of PMTCT before and after extensive community awareness mobilization on PMTCT indicated that the increase in awareness towards PMTCT also increases PMTCT services utilization for pregnant women significantly [19].

Conclusion

More than four-fifth (82.3%) mothers knew about prevention of mother-to-child transmission of HIV and 97.4% had good attitude towards it. Only about half (48.3%) of the respondents knew that antiretroviral drugs given for sero-positive pregnant mothers could reduce the risk of HIV transmission. About 96% of mothers have been tested for HIV/AIDS.

Women's empowerment through education, improving ANC follow up status and male involvement were significantly associated with PMTCT knowledge, attitude and uptake of the services. Fear of stigma, discrimination and lack of confidentiality were hindering partners from knowing their sero-status. Community mobilization through community conversation had a potential to influence and promote PMTCT services.

Competing Interests

The authors declare that they have no any competing interests.

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References

- UNAIDS WHO (2009) AIDS Epidemic Update. Geneva, UNAIDS.
- (2005) Rates of mother-to-child transmission of HIV-1 in Africa, America, and Europe: results from 13 perinatal studies. The Working Group on Mother-To-Child Transmission of HIV. *J Acquir Immune Defic Syndr Hum Retrovirol* 8: 506-510.
- WHO (2007) Guidance on Global Scale up of the Prevention of PMTCT of HIV. Toward Universal access for Eliminating HIV and AIDS among children.
- WHO (2006) Antiretroviral drugs for treating pregnant women and preventing HIV infection in infants: towards universal access: recommendations for a public health approach. Geneva, World Health Organization.

5. WHO (2009) Rapid advice: use of antiretroviral drugs for treating pregnant women and preventing HIV infection in infants. Geneva, World Health Organization.
6. Ethiopia Ministry of Health (2007) Guidelines for Prevention of Mother-to-Child transmission of HIV in Ethiopia.
7. De Cock KM, Fowler MG, Mercier E, de Vincenzi I, Saba J, et al. (2000) Prevention of mother-to-child HIV transmission in resource-poor countries: translating research into policy and practice. *JAMA* 283: 1175-1182.
8. WHO/UNAIDS/UNICEF (2007) Towards universal Access scaling up priority HIV/AIDS Intervention in the health sector. Progress report, Ethiopia.
9. Central Statistical Agency Addis Ababa Ethiopia (2012) Ethiopia Demographic and Health Survey 2011. ICF International Calverton, Maryland, USA.
10. Dejene M (2001) Study on Factors Affecting Accessibility and Acceptability of Voluntary Counseling and Testing Service for HIV/AIDS in Bahir Dar town, North-west Ethiopia.
11. Perez F, Orne-Gliemann J, Mukotekwa T, Mille A, Glenshaw M, et al. (2004) Quality Improvement Report Prevention of Mother-to-Child Transmission of HIV Evaluation of a pilot Programme in a district Hospital in rural Zimbabwe. *BMJ* 329: 1147-1150.
12. Chivonivoni C, Ehlers VJ, Roos JH (2008) Mothers' attitudes towards using services preventing mother-to-child HIV/AIDS transmission in Zimbabwe: an interview survey. *Int J Nurs Stud* 45: 1618-1624.
13. Chernet Hailu (2008) Assessment of Knowledge, Attitude and Practice among Mothers about VCT and Feeding of Infants born to HIV positive women in Jimma town, Ethiopia.
14. Seid M (2007) Prevalence and Determinants of HIV Testing among Pregnant Mother at Antenatal Care Setting of Selected Health Centers in Addis Ababa.
15. Haddis M, Jerene D (2008) Awareness of antenatal care clients on Mother-to-child transmission (MTCT) of HIV infection and its prevention in Arba Minch. *Ethiop J Health Dev* 20: 55-58
16. Tasew T (2008) Factors Affecting Acceptance of HIV Testing among ANC, with Emphasis on role of Male Partners in Wolaita zone.
17. Ashebir DZ (1996) HIV/AIDS awareness, knowledge and practice in patients with sexually transmitted diseases. *Ethiop Med J* 34: 25-32.
18. Ulasi CI, Preko PO, Baidoo JA, Bayard B, Ehiri JE, et al. (2009) HIV/AIDS-related stigma in Kumasi, Ghana. *Health Place* 15: 255-262.
19. Fylkesnes K, Musonda RM, Sichone M, Ndhlovu Z, Tembo F, et al. (2001) Declining HIV prevalence and risk behaviours in Zambia: evidence from surveillance and population-based surveys. *AIDS* 15: 907-916.