

*Full Length Research Paper*

# Level of male partner involvement and associated factors in prevention of mother to child transmission of HIV/AIDS services in Debreworkos town, Northwest Ethiopia

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The largest source of HIV infection in children is mother-to-child transmission. Lack of men involvement deprives women of their partners care and support in coping with HIV infection, in taking antiretroviral therapy and making appropriate infant feeding choices. Thus, this study assessed the level of male involvement and associated factors in prevention of mother-to-child transmission of HIV. A cross-sectional study was conducted using simple random sampling from 15<sup>th</sup> March to 30<sup>th</sup> April 2013. Pre-tested structured questionnaire was used to collect the data. Data were collected from 274 respondents. The data were cleaned, coded and entered into Epi Info 6.0 then exported and analyzed using SPSS 16.0. One hundred ninety eight (72.26%) of the respondents scored above seven on a 14-point scale of measurement for male involvement. Male involvement was found to have a statistically significant association with self-employment (AOR= 0.36, 95%CI: 0.16-0.84), daily laborer (AOR= 0.14, 95%CI: 0.06-0.36), moderate knowledge about PMTCT (AOR= 4.4, 95%CI: 1.9-10.0), good knowledge about PMTCT (AOR= 3.2, 95%CI: 1.29-7.9) and moderate programmatic factors (AOR= 10, 95%CI: 2.0-56.0). The level of male partner involvement was 198 (72.26%). Information on PMTCT coupled with male-friendly PMTCT services should be provided to the public.

**Key words:** Male involvement, PMTCT, HIV/AIDS, Ethiopia, HIV/AIDS.

## INTRODUCTION

Globally, mother-to-child transmission (MTCT) of HIV is the largest source of HIV infection in children below the age of 15 years affecting approximately 380,000 infants per year.

MTCT is causing great social problems by increasing the burden of orphans after the death of one or both parents due to AIDS (UNAIDS, 2011).

Sub-Saharan Africa is at the epicenter of the epidemic to carry full brunt of its health and socio-economic impacts. Ethiopia is among the countries most affected by the HIV epidemic characterized by high adult HIV/AIDS

HIV/AIDS prevalence (1.5%), with a large number of people living with HIV (approximately 800,000) and about 1 million AIDS orphans (FHAPCO, 2012).

Antenatal care (ANC) sentinel surveillance data showed that prevalence of new infection among pregnant women 15-24 years of age has declined from 5.6% in 2005 to 3.5% in 2007 and 2.6% in 2011 (FHAPCO, 2012).

Ethiopia has initiated prevention of mother-to-child transmission (PMTCT) of HIV services in 2001. The number of pregnant mothers who received pre-HIV test counseling has increased from 711,341 in 2009/10 to 1,161,752 by the end of June 2011. However, the overall coverage of PMTCT still remains as low as 24% of the expected eligible population (FHAPCO, 2012). Ethiopia represents 2% of the global gap in reaching 90% of preg-

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nant women living with HIV in need of antiretroviral (ARV) for PMTCT (UNICEF, 2011).

Lack of male involvement in PMTCT deprives women of their partners care and support in coping with HIV infection, in taking antiretroviral therapy and making appropriate infant feeding choices (WHO, UNAIDS, UNICEF, 2011). Limited or lack of male partner involvement in PMTCT services is one of the major impediments in scaling up and increasing population coverage of PMTCT. Male involvement is said to be very low in many health facilities in Ethiopia and is one of the potential program gaps adversely affecting PMTCT services uptake in the country (FHAPCO, 2012). Male involvement is also one of the major challenges for PMTCT services program although all counseled and tested women advised and invited with invitation card to come with their partners in their subsequent visits (Debreworkos district health office, 2011).

The reasons for low PMTCT uptake needs to be closely linked with the efforts to expand the coverage of maternal and child health services. Sub-optimal male participation is considered as a bottleneck for PMTCT programmatic achievement. It is believed that the uptake of PMTCT interventions such as ARV prophylaxis, exposed infant follow-up, infant feeding options by women would improve with the involvement of male partners. However, the factors associated with poor male participation are not well known in Ethiopia and need to be investigated to help the country devise reasonable strategies to address this bottleneck (FHAPCO, 2011; Getu K, 2011). Thus, this study aimed at providing information on the level of male partner involvement in PMTCT services and factors associated with it. The findings of the study could influence and inform policy makers and managers in matters pertaining to improve PMTCT services.

## METHODS

### Study Design, Area and Period

A community-based cross sectional study was conducted to assess the level of male partner involvement and its associated factors in PMTCT services. The study was conducted in Debreworkos town (Northwest Ethiopia) from 15<sup>th</sup> March to 30<sup>th</sup> April 2013.

### Study Population

Eligible males who were either sexual partners or husbands of either a pregnant women or women with infants were the source population.

### Sample and Sampling Procedure

The required sample size was determined using single

population proportion formula. The assumptions used were 95% confidence interval, 5% marginal error and 10% non-response rate. Accordingly, the total sample size was 284 males. List w= margin of error  $(0.05n = (1.96)2X(0.5)2(0.05)1 + n$  List of pregnant and delivered women were extracted from community-based intervention for action (CBIA) data in Debreworkos administration health office, which was collected by health extension workers. List of samples was done among 209 pregnant and 587 delivered women who had infants; personal records from those women were used to identify the address of their male sexual partners or husbands and then a simple random sampling technique was used. Computer generated random numbers were used to select 284 representative samples.

### Data Collection Procedure

Pre-tested structured questionnaire was used to collect the data. The questionnaire was adopted from previous study on factors related to male participation in PMTCT (Getu K, 2011).

The questionnaire contained five sections:

- Section 1: Socio-demographic and economic characteristics;
- Section 2: Knowledge and awareness of PMTCT services;
- Section 3: Socio-cultural norms;
- Section 4: Programmatic factors (male friendliness of health facilities); and
- Section 5: Level of male participation in PMTCT services

### Data Quality Control

Pre-test was done on 10% of the total sample. The data collection process was supervised by the investigators and health extension supervisors. Data completeness and consistency were also verified using cross-tabulation. Moreover, the collected data were cleaned, coded and entered to Epi Info version 6.0 and SPSS 16.0.

### Data Analysis

The collected data were cleaned, coded and entered into Epi Info 6.0 computer programs prior to the analysis and exported to SPSS version 16. Then, recoded, categorized and sorted to facilitate the analysis. Descriptive analysis was used to describe the percentages and distributions of the respondents by socio-demographic characteristics and other relevant variables. Furthermore, binary logistic regression was used to identify factors associated with male partner involvement in PMTCT services. The crude and adjusted odds ratios with their corresponding 95% confidence inter-

vals were computed. A p-value of <0.05 was considered to declare statistically significant association with dependent and selected independent variables. The results were presented in text and tables based on the types of data.

## Variables of the Study

### Dependant Variable

Level of male partner involvement in PMTCT services

### Independent Variables

Socio-economic and demographic factors: age, ethnicity, religion, marital status, residence, level of education, occupation, income, number of biological children born from couples and duration of relationship with female partner.

Knowledge and awareness about HIV/AIDS: knowledge of the routes of transmission of HIV, including MTCT, PMTCT and the benefits of HIV-testing and awareness of the existence of PMTCT services in healthcare institutions.

Cultural factors: male partners opinions, perceptions and role as relating to ANC/PMTCT and HCT.

Programmatic factors: barriers to male participation in PMTCT services and measures to make the health facilities friendly to promote male participation in PMTCT. These include issuing a medical certificate, services in special hours and weekends, separate waiting area for males, allowing entrance of males into ANC/labor and delivery units, sending invitations for male service attendance, signposting, invitations for males to attend ANC/PMTCT clinics and routine offers of HIV-testing for males. Barriers related to confidentiality were also considered to measure male friendliness of the services in this study.

### Definitions

Partner: One who is married to or cohabitating with another individual of opposite sex.

Level of male involvement in PMTCT services: Measured based on the information collected on 14 questions (Getu K, 2011).

Low male involvement in PMTCT services: If a potential respondent responded below 7 correct answers from 14 questions (Getu K, 2011);

High male involvement in PMTCT services: if a potential respondent responded above 7 correct answers from all 14 questions (Getu K, 2011).

Poor knowledge towards PMTCT services: If a respondent

responded to less than 10 correct answers from 20 questions (Getu K, 2011).

Medium knowledge: if a respondent responded to 10-15 correct answers from 20 questions (Getu K, 2011).

Good knowledge: If a respondent responded to above 15 correct answers from 20 questions (Getu K, 2011).

### Ethical considerations

Ethical clearance was obtained from the Ethical Review committee of DebreMarkos University, College of Health Sciences, Department of Public Health. Verbal informed consent was obtained from each participant prior to the interview. Confidentiality and privacy of the information were assured and maintained.

## RESULTS

### Socio- Demographic and Economic Characteristics

Data were collected from 274 respondents yielding a response rate of 96.4%. As shown in Table 1, the mean age of the respondents was 32.8 years ( $\pm 1.3$  SD). The aggregate age group 20-39 years contributed to 200 (82.0%) of the total sample.

The majority, 258 (94.4%), of the respondents were Orthodox Christians. The duration of relationship in marriage with partner was less than 5, 5-10 and >10 years for 153 (55.8%), 87 (31.8%) and 34 (12.4%) of the partners respectively. The number of live children common to the respondent and corresponding partner ranged from 0 to 9 with the mean of 2.02 ( $\pm 1.444$  SD). Most of the respondents, 107 (39.1%), had one living biological child and 75 (27.4 %) had two living children. More than half were government employees 140 (51%). The majority 125 (45%) completed tertiary school. One-third (32.5%) of the respondents obtained USD 71-150 monthly income (Table 1).

### Knowledge about PMTCT/HIV

#### Knowledge on means of HIV transmission

As indicated in Table 2, most, 249 (90.9%), of the male partners responded corrected that HIV could be transmitted from mother-to-child whereas 12 (4.4 %) and 13 (4.7%) of the partners responded corrected that HIV could not be transmitted from the infected mother to the baby and uncertain about mother to child transmission respectively. Two hundred eighteen (77.9%), 222 (81%) and 223 (81.4%) participants knew that MTCT of HIV could be during pregnancy, labor and delivery, and breast feeding respectively (Table 2).

**Table 1.** Socio-demographic and economic characteristics of male partners in PMTCT services in Debremarkos, Northwest, 2013.

Socio-demographic & economic variables	Frequency	Percent
<b>Age (in years)</b>		
20-24	20	7.3
25-29	73	26.6
30-34	66	24.1
35-39	64	23.4
40-44	40	14.6
45-50	11	4.0
<b>Religion</b>		
Orthodox	258	94.2
Protestant	10	3.6
Catholic	1	1.8
Muslim	5	0.4
<b>Duration of relationship</b>		
<5 years	153	55.8
5-10 years	87	31.8
>10 years	34	12.4
<b>Level of education</b>		
Cannot read and write	13	4.7
Read and write	31	11.3
Complete primary school	44	16.1
Complete secondary school	50	21.9
Diploma and higher	125	46.0
<b>Income (in USD)</b>		
13-33	32	11.7
34-70	82	29.9
71-150	89	32.5
151-500	61	22.3
Outlier	5	1.8
Refused to tell	5	1.8

### Knowledge on the ways of reducing MTCT

As shown in Table 2, the majority, 241 (88%), of respondents knew that HIV Counseling and Testing (HCT) of pregnant women and their male partners 118 (45.2%), and provision of ARV 171 (65.2%) could reduce MTCT of HIV. Respondents were aware that the risk of MTCT of HIV could be reduced by caesarean section 114 (43.7%), total avoidance of breastfeeding 139 (53.3%) and use of family planning methods (condoms) 186 (71%) for HIV-infected couples. Condom may reduce the risk of HIV exposure of mothers particularly in sero-discordant cases and hence decreases MTCT (Table 2).

### Knowledge about PMTCT services

Two hundred thirty six (86.8 %) of the respondents

knew and heard about PMTCT services. Furthermore, 222 (81.0%) respondents knew services offered in government health facilities and 241 (80%) knew HIV counseling and testing (HCT) service was provided for pregnant women in ANC clinics.

### Level of knowledge on routes of transmission of MTCT

The score (level) of knowledge of routes of transmission of MTCT services ranged from 4 to 16 on 20 scale measurement. The mean score was 11.72 ( $\pm 3.43$  SD). The respondents' score was 26.8% and 67.8% for poor and medium knowledge respectively. While only 5.4% of the respondents were scored for good knowledge.

**Table 2.** Knowledge of male partners on prevention of mother-to-child transmission of HIV in Debremarkos town, Northwest Ethiopia, 2013.

Items	Yes		No		I Do Not Know	
	N	%	N	%	N	%
HIV can be transmitted from mother to child	249	90.9	12	4.4	13	4.7
HIV can be transmitted from infected mother to child during pregnancy	218	77.9	34	12.4	22	8.4
HIV can be transmitted from infected mother to child during labor and delivery	222	81.0	19	7.3	32	11.7
HIV can be transmitted from infected mother to child during breast feeding after birth	223	81.4	25	9.6	25	9.6
HIV counseling and testing for male partners can help to reduce mother to child HIV transmission	118	45.2	90	34.5	53	20.3
Delivering baby by cesarean section reduce the chance of transmission of HIV from a mother to her child	114	43.7	64	24.5	83	31.8
Complete avoiding breast feeding reduce the chance of transmission of HIV from a mother to her child	139	53.3	71	27.2	51	19.5
Giving Antiretroviral drugs to the mother and the child reduce the chance of transmission of HIV from a mother to child	171	65.5	44	16.9	46	17.6
Exclusive breast feeding for first 6 months is one option to reduce mother to child HIV transmission	69	26.4	142	54.4	50	19.2
Using contraception by HIV positive couple can reduce mother to child HIV transmission	186	71.3	26	10	49	18.8

### Respondents' Opinion about Socio-Cultural Factors

As shown in Table 3, twelve statements to measure the opinion of the male partners were constructed using a likert scale of five categories. Accordingly, 55 (20.4%) respondents preferred postponing partner's HCT after pregnancy; moreover, 157 (57.3%) disagreed the need of male partner attendance of ANC clinics due to time constraint.

The majority, 193 (70.4%), of males believed a positive HIV test result of the female partner implied her unfaithfulness. Almost half of the respondents, 139 (50.7%), responded that PMTCT clinics were only for women and children. Only 144 (52.6%) supported compressive HCT and 101 (36.9%) had willingness to use condom to prevent MTCT (Table 3).

Respondents' scores were categorized into four groups using cut-off values used in other study (Getu K, 2011). Almost all, 272 (99.3 %), were within the range of low score level on total score of socio-cultural factors.

### Items on Programmatic Factors

Participants were asked to give their opinion on 10 items assessing program of health facilities and the PMTCT

program. For ease of analysis, "strongly agree" and "agree" were grouped into "agree", while "strongly disagree" and "disagree" were grouped into "disagree" (40, 41).

As indicated in Table 4, the majority of respondents, 236 (86.1%), agreed that PMTCT services to have a flexible time schedule with service provision even during evenings and weekends.

Moreover, about two-third, 172 (62.8%), of males agreed that HCT service be brought near their usual residential area though distance did not seem to be the major obstacle, with only 62 (22.6%) feeling that health facilities were located at a distance.

One hundred nineteen (43%) of the respondents disagreed on the idea of separate waiting area for males and women. Only 151 (55.1%) had received an invitation to attend PMTCT by ANC clinics and 164 (56.9%) had heard an invitation through the media promoting male participation in PMTCT. Thirty three percent of the respondents agreed that providers did not request males to enter to MCH clinics, even if accompanying their partners (Table 4).

Majority of the participants, 208 (79.7%), scored 'moderate' on programmatic influence where as 45 (17.2%) and 7 (2.7%) scored for high and low programmatic influence respectively.

**Table 3.** Respondents belief about socio-cultural factors on level of male involvement in PMTCT in Debremarkos town, Northwest Ethiopia, 2013.

Items	Agreed		Uncertain		Disagree	
	N	%	N	%	N	%
A Pregnant woman can be tested for HIV without the permission of husband	249	90.9	16	5.8	9	3.3
Men should accompany their pregnant wives to ANC/PMTCT	244	89.1	15	5.5	15	5.5
It is a taboo for men to discuss with women about HIV testing During pregnancy	21	7.7	40	14.6	213	77.7
Men and women should undergo HIV testing at the same time at PMTCT	44	16.1	46	16.8	184	67.2
Couples can use condoms to reduce chances of mother to child transmission	101	36.9	16	5.8	157	57.3
ANC/PMTCT clinics are for women and children only	139	50.7	22	8.0	113	41.2
A positive HIV test in a pregnant women shows that she has been unfaithful	193	70.4	3	1.1	78	28.5
If a pregnant woman found to be HIV positive she should be divorced	81	29.6	14	5.1	179	65.3
An HIV test result of a pregnant woman indirectly confirms HIV status of her partner	132	48.2	27	9.5	115	42.0
it suffices /enough that a pregnant woman be accompanied to ANC clinic by less busy man	157	57.3	19	6.9	98	35.9
It is better to live with unknown HIV status than live depressed with positive HIV	55	20.1	41	15.0	178	65.0
It is appropriate to offer HIV testing for all clients visiting a health institution.	144	52.6	14	5.1	116	42.3

Items 3, 6, 7, 8, 9 and 10 above were with negative connotations.

### Level of Male Participation in PMTCT Services

Respondents were asked a total of 14 questions to assess the level of male involvement in PMTCT and graded as low if they responded below 7 correct questions and high if more than 7 correct answers.

### Male involvement in PMTCT: Actions

As shown in Table 5, more than half 157 (57.3%) of the respondents did self-initiated discussion about HIV-testing with their partner and had supported ANC follow up for their partners by covering medical expenses 242 (88.3%), asking what went on during appointment visits 189 (72.6%), reminding follow up schedule 202 (73.7%) and accompanying the partner to ANC clinics at least once 202 (73.7%). Out of 202 respondents who had accompanying their partners to ANC clinics, 190 (69.3%) respondents were entered into ANC room together and only 152 (54.7%) were counseled and/or tested for HIV (Table 5).

### Male involvement in PMTCT: Intentions

As shown in Table 5, 229 (83.6%) respondents affirmed acceptance of provision of ARV for partners and newborn and only 80 (30.7%) agreed supporting the medical follow up of the newborn. Almost four-fifth, 221 (80.7%) agreed to disclose their HIV-positive status to their partner but 75 (27.3%) agreed to discontinue conjugal relationship if their partners' HIV status were positive while 199 (72.6%) were confident of using condom consistently in case of discordant HIV status (Table 5).

### Total score of level of male involvement in PMTCT

As indicated in Table 5, respondents' total score on male involvement was calculated by summing up the scores of 14 items designed to assess male involvement. All items had an equal weight of score 1. For all items except item 13, a score of 1 was given for "yes" responses for positive connotation and 0 (zero) for "no" or "uncertain" responses for negative connotation while for Item 13 a score of 1 was assigned for "no" or "uncertain" response because of its

**Table 4.** Programmatic factors on level of male partner involvement in PMTCT in Debreworkos town, Northwest Ethiopia, 2013.

Items	Agreed		Disagreed		Uncertain	
	N	%	N	%	N	%
ANC should be opened on weekends and evening for men to attend with their partner	236	86.1	28	10.2	10	3.6
Distance from health facility was major obstacle for you to attend ANC/PMTCT clinic with your partner	62	22.6	188	68.6	24	8.8
Couple HCT for PMTCT should be conducted at villages	172	62.8	74	27.0	28	10.2
There should be separate waiting areas for men and women visiting MCH	119	43.4	110	40.1	45	16.4
There should be a different exit after HIV testing to avoid being identified by the crowd waiting for service	113	41.2	128	46.7	32	12.0
Have you noticed health facilities inviting/promoting male involvement in PMTCT through Mass media	151	55.1	43	15.7	80	29.2
Have you ever seen a sign board with picture or message promoting male involvement In PMTCT at gate or in premise of any health facilities	157	57.3	41	15	76	27.7
If your partner had ANC follow up, have you been invited verbally or in written for your attendance by the ANC	164	59.9	45	16.4	65	23.7
From what you have observed or heard service providers do not request men in waiting area to enter in to ANC together with their partner.	93	33.9	99	36.1	82	29.9
Facilities do give men medical certificate of ANC attendance if required by employee	60	21.9	86	31.4	12	46.7
					8	

negative connotation and 0 (zero) for “yes” response. From the total score, 198 (72.26%) respondents highly involved while the rest, 76 (27.7%) participants had low involvement in PMTCT services. The composite score of participation in PMTCT ranged from 0 to 14 with a mean of 9.5 ( $\pm$  3.8 SD).

### Bivariate and multivariable logistic regression analyses

#### Bivariate logistic regression analysis

As shown in Table 6, on bivariate logistic regression analysis, age, socio-cultural factors, number of children and monthly income had insignificant association; however, level of education, occupation, programmatic factors and knowledge on PMTCT had statistical significant association with level of male partner involvement in PMTCT (Table 6). The variables age, level of education, occupation, income, knowledge on PMTCT/HIV AIDS and programmatic factors were fitted to multivariable analysis (Table 6).

#### Multivariable Logistic Regression Analysis

As indicated in Table 6, in order to identify independent factors of male involvement in PMTCT services,

multivariable analysis was performed. Accordingly, level of education, occupation, knowledge, income and programmatic factor were fitted to the model. The finding showed significant association for self-employed (AOR=0.36, 95%CI: 0.16-0.84), daily laborer (AOR=0.14, 95%CI: 0.06-0.36), moderate knowledge about PMTCT services (AOR=4.4, 95%CI: 1.93-10), good knowledge about PMTCT services (AOR=3.2, 95%CI: 1.294-7.9), moderate programmatic factors (AOR=10, 95%CI: 2.012-56) and high programmatic factor (AOR=14, 95% CI: 2.3-86).

Self-employed participants were 0.36 times less likely to be involved in PMTCT services compared to government workers; moreover, daily laborers were 0.14 times less likely involved in PMTCT services compared to government workers.

Furthermore, participants who had moderate and good knowledge about PMTCT services were 4.4 and 3.2 times more likely involved in PMTCT services than male partners with low knowledge about PMTCT services respectively. Male partners who were moderately influenced by the program were 10 times more likely involved in PMTCT services than those with low programmatic influence.

Moreover, male partners who were highly influenced by the program were 14 times more likely involved in PMTCT services than with low programmatic influence (Table 6).

**Table 5.** Level of male partner involvement in PMTCT services in Debreworkos town, Northwest Ethiopia, 2013.

Items	Yes		No		Uncertain	
	N	%	N	%	N	%
Self-initiated discussion on importance of PMTCT services	157	57.3	67	24.5	50	18.2
Requesting wife to be tested for HIV during the current/ previous pregnancy	162	59.1	90	32.8	22	8.0
Asking the information/services she got during ANC follow up	189	72.6	52	19.0	23	8.4
Reminded the female partner of ANC follow up	202	73.7	56	20.4	16	5.8
Cover medical expenses of the female partner during ANC follow up of pregnancy if any	242	88.3	19	6.9	13	4.7
Accompany her to ANC clinic at least once during her pregnancy	202	73.7	54	19.7	18	6.6
If accompanied her, did you enter into ANC room together with your partner?	190	69.3	80	30.3	1	0.4
HCT for HIV during her pregnancy	162	59.1	90	32.8	22	8.0
If HCT, were you counseled and tested together	150	54.7	90	32.8	34	12.4
Confiding female partner if you test positive for HIV	221	80.7	21	7.7	32	11.7
Willingness to accept that she and the newborn take ARVs for PMTCT	229	83.6	18	6.6	27	9.9
Helping the newborn's medical follow up until the HIV status is known	84	30.7	102	37.2	88	32.1
Willingness to discontinue your conjugal if she is HIV positive	75	27.3	135	49.3	64	23.4
Use of condom consistently in case of discordant result	199	72.6	52	19.0	23	8.4

## DISCUSSION

This study found that 198 (72.26%) male partners were involved in the PMTCT services. This finding was lower than the result reported from three public hospitals in Addis Ababa, Ethiopia, which revealed that male participation in the PMTCT services is 190 (88%), (Getu K, 2011). However, a study in eastern Uganda found that only 99 (26%) of the respondents had high level of participation (Byamugisha R, James KT, Nulu S et al., 2010). This difference could be attributed to the methods used (institutional-based in later study) and the timing of the study.

This study found a number of factors associated with male involvement in the PMTCT services. Various occupation categories were associated with male involvement. In this study, self-employed participants and daily laborers were less likely to get involved than government workers. Consistently, a study in Easter Uganda found that male drivers were less likely to have a high male involvement index (Byamugisha R, James KT, Nulu S et al., 2010). In Malawi, males did not have time to attend ANC with their partners since they utilize the time to obtain money to take care of their families due to socio-economic difficulties (Aarnio P, Olsson P, Chimbiri A and Kulmala T, 2010). However, a study in Kyaikmaraw, Myanmar showed that respondents working

in private business involved more in PMTCT ( $p=0.006$ ), (Thider A, 2009).

This study found that males with moderate knowledge about PMTCT services were more likely involved in PMTCT services than those with poor knowledge. Other studies in three public hospitals in Addis Ababa, Ethiopia, and in Mambwe district of Zambia revealed a significant association between knowledge of male partner with their involvement in PMTCT services (Katz DA, Kiarie JN, John-Stewart GC et al., 2009; Getu K, 2011). Lack of information on PMTCT and HIV testing in Tanzania has contributed to low male partner involvement in PMTCT services (Family Health International, 2011) moreover, study in Easter Uganda found that participants who had heard about the PMTCT services were 2 times more likely to get involved in the services (Byamugisha R, James K T, Nulu S et al., 2010).

This study found that programmatic factors were associated with level of male involvement in PMTCT services. Male partners who were less influenced by the program involved less in PMTCT services. Studies conducted in three countries namely, Cameroon, Democratic Republic of Congo and India indicated that male partners rarely participated in ANC services due mainly to the perception that it is within women's domain both traditionally and programmatically (Julie P, Annie M, Ravi V et al.,). In Uganda, men reported having been forced



**Table 6.** Bivariate and Multivariable logistic regression analysis on level of male involvement and associated factors in PMTCT services in Debreworkos town, Northwest Ethiopia, 2013.

Variables	Male involvement		COR (95%CI)	AOR (95%CI)
	Low	High		
<b>Age</b>				
20 -25	2	18	1	1
26-30	26	47	<b>0.20 (0.43-0.934)</b>	0.29 (0.05-1.6)
31-35	15	51	0.38 (0.08-1.82)	0.52 (0.09-3.0)
36-40	20	44	0.24 (0.05-1.16)	0.33 (0.06-1.8)
41-45	11	29	0.29 (0.58-1.47)	0.36 (0.06-2.3)
46-50	2	9	0.50 (0.06-4.2)	0.40 (0.05-4.6)
<b>Level of education</b>				
Cannot read and write	9	4	1	1
Read and write	18	13	1.63 (0.41-6.4)	2.2 (0.47-9.9)
Complete 1 <sup>o</sup> school	14	30	<b>4.80 (1.26-18)</b>	3.8 (0.85-17)
Complete 2 <sup>o</sup> school	11	49	<b>10.0 (2.6-38)</b>	4.7 (1.06-21)
Diploma and higher	24	102	<b>9.0 (2.7-33)</b>	3.2 (0.75-14)
<b>Income (in USD)</b>				
13-33	14	18	1	1
34-70	25	57	1.77 (0.76-4.12)	1.21(0.4-3.40)
71-125	23	66	2.23 (0.96-5.2)	1.17 (0.39-3.5)
126-500	11	50	<b>3.53 (1.35-9.2)</b>	1.80 (0.53-6.0)
Outlier	1	4	3.11(0.3-31.0)	3.0 (0.16-58.0)
Refused to tell	2	3	1.17 (0.17-1.79)	1.0 (0.1-10.0)
<b>Occupation</b>				
Governed employee	25	116	1	1
Self-employee	15	24	0.345 (0.16-0.75)	0.36(0.16-0.84)*
Private	15	46	0.661(0.35-1.36)	0.85 (0.38-1.8)
Daily labor	21	12	0.123 (0.05-0.28)	0.14(0.06-0.36)*
<b>Programmatic factors</b>				
Low programmatic factor	7	2	1	1
Moderate programmatic factor	56	162	10(2.04,50)	10(2.012,56)*
High programmatic factor	12	34	9(1.80,54.4)	14 (2.3,86)*
Very high programmatic factor	1	0	0	.000
<b>Knowledge on PMTCT</b>				
Poor knowledge on PMTCT	23	15	1	1
Moderate knowledge on HIV/PMTCT	33	121	5.6(2.6,11.9)	4.4(1.93,10)*

\*\*significant at p-value of  $\leq 0.05$ ; COR: Crude odd ratio; AOR: adjusted odd ratio; CI: confidence interval

to wait an entire day for care at antenatal clinics, a heavy sacrifice for someone who needs to work to support his family. They were also excluded from the session where their wives were examined and had to wait outside without any information about what was happening to their pregnant wives (Byamugisha R et al., 2010). Health workers mistreatment of spouses made them uncomfortable and embarrassed. Lack of adequate space in the ANC clinics coupled with shortage of health workers and an increase in women attending ANC demotivate men from attending ANC with their spouses since they have to wait for a long time (Byamugisha R et al., 2010). In Democratic Republic of Congo, male participation in VCT associated with ANC was higher in non-health service settings such as bars and church-based VCT centers and male participation in PMTCT services

increased from 2% to 18% when men were invited to PMTCT services through invitation letters (Ditekemena J, Matendo R, Koole O et al., 2007). This study included only urban residents and generalization is hardly possible.

## Implications of the Study

### To Healthcare Institutions

Information regarding PMTCT of HIV coupled with male friendly PMTCT services should be provided to the public through available channels such as print and electronic media, billboards and posters, and opinion/religious leaders.

Promotion messages focusing on males' role of PMTCT of

HIV and the benefits of participation should be scaled up to the community.

Flexible ANC consultation hours extending beyond the routine clinic hours should be considered to address the needs of males with strict work schedules.

### To the Community

Community-based volunteers and healthcare cadres at community level (health extension workers in Ethiopia) should be strengthened and enhance the agenda of male involvement in PMTCT services closer to the community.

### To Research Institutions

Further comprehensive research should be done on male involvement in PMTCT services in different settings to compare the urban-rural, public-private and hospital-health centre disparities.

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