



## Male Partner Participation in Preventing Mother-to-Child Transmission of Human-Immunodeficiency Virus (PMCHT) and its Predictive Factors in Bishoftu, Central Ethiopia

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ARTICLE INFO	ABSTRACT
<p><b>Article type:</b> Original article</p> <hr/> <p><b>Article History:</b> Received: 12-Apr-2018 Accepted: 08-Jun-2018</p> <hr/> <p><b>Key words:</b> Human-immunodeficiency virus mother-to-child HIV transmission Male involvement Ethiopia</p>	<p><b>Background &amp; aim:</b> Globally, human-immunodeficiency virus (HIV) is threatening the lives of human being. Despite the several programs supporting male partner involvement in the prevention of mother-to-child HIV transmission (PMCHT), only few male partners have accepted and involved in this process. Regarding this, the present study aimed to assess male partner involvement in the PMCHT and its associated factors in Bishoftu, Central Ethiopia</p> <p><b>Methods:</b> This cross-sectional study was conducted on 405 male partners whose mates gave birth in Bishoftu during June, 2016. The study population was selected using simple random sampling technique. Data collection was performed by means of a self-administered interview questionnaire. The data were analyzed in SPSS software (version 20) using Chi-square test and t-test. P-value less than 0.05 was considered statistically significant.</p> <p><b>Results:</b> A total of 405 male partners participated in this study with a response rate of 96.2%. The mean age of the participants was 34.03±5.8 years. Spousal participation index in the PMCHT service in Bishoftu town was obtained as 211 (52.1%). The significant predictors of male partner participation in the PMCHT programs included low knowledge about PMCHT services (adjusted odds ratio [AOR]=2.27, 95% CI: 1.12-4.57), negative attitude towards these programs (AOR=2.09, 95% CI: 1.23-3.67), unawareness about the provision of PMCHT services in the public health facilities (AOR=2.41, 95% CI: 1.27-4.95), and perceiving attending antenatal care and PMCHT program as only women's responsibility (AOR=3.96, 95% CI: 2.00-7.81).</p> <p><b>Conclusion:</b> As the findings indicated, male partner participation in the PMCHT service was not at a satisfactory level. Consequently, it is highly recommended to equip the male partners with knowledge, as well as positive attitude and perception towards these services.</p>

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### Introduction

The growing prevalence of human immunodeficiency virus (HIV) has exposed the life of human being to a great risk. At the end of 2014, approximately 37 million people were infected with HIV among which 7% were children. A great proportion of this rate live in countries with a low socioeconomic status. In the same year, two million new infections were

reported, nearly 220,000 cases of which had affected children. The majority of these children were residing in Sub-Saharan Africa and had acquired the infection during the pregnancy, childbearing, or breastfeeding by HIV-seropositive mothers (1).

Ethiopia is among the countries extensively affected by HIV. In addition to the overriding

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hetero-sexual transmissions, vertical transmission from mother to child accounts for greater than 90% of pediatric HIV cases. Mother-to-child HIV transmission results in big social difficulties by imposing a burden of orphans to society following the death of one or both of the parents due to HIV (2, 3).

The inhibition of mother-to-child AIDS transmission is one of the approaches to prevent pediatric HIV infection. Taking this fact in to account, the prevention of mother-to-child HIV transmission (PMCHT) program has been implemented in Ethiopia since 2001. However, this target remains a challenge for the country due to the low coverage of the service, inadequate quality of the available service, and low male involvement in these programs (4).

Universally, the enhancement of male partner participation in PMCHT has been given a special importance. However, testing male spouses for HIV with the aim of preventing MCHT has challenged the majority of the countries with a low and middle socioeconomic status (5). The lack of male partner involvement in PMCHT deprives women of their partners' care and support in coping with HIV infection, receiving antiretroviral therapy, and making appropriate infant feeding choices.

The inadequate or lack of male partner participation in PMCHT programs is one of the key factors inhibiting the wide scope coverage of PMCHT. Partner engagement is supposed to be precisely limited in various health institutions in Ethiopia and is one of the gaps adversely affecting PMCHT service outcomes in Ethiopia (6, 7).

Furthermore, partner engagement is part of the foremost challenges in the implementation of PMCHT programs in the area under investigation. For instance, although all women were counseled and tested for HIV during their antenatal care (ANC) visit, only 17% of the pregnant women were accompanied by their partners, which is certainly lower than the rate (50%) anticipated by the World Health Organization (8).

The reasons for low PMCT uptake should be closely linked with the efforts to expand the coverage of maternal and child health services. The suboptimal participation of male partners in such programs is reflected as a bottleneck

for PMCHT realization. Evidence suggests that the participation of male partners in the PMCHT interventions would positively affect the outcomes of such programs, such as the initiation of antiretroviral therapy, follow-up of the exposed infants, and infant nourishing choices by women. However, the factors accounting for reduced male involvement in Ethiopia have not been well described yet. Consequently, it is necessary to identify these factors to develop relevant strategies targeted toward the elimination of this shortcoming (9).

Despite the importance of this issue, little research has been focused on the identification of the factors affecting PMCHT programs. Moreover, these studies are limited in scope by focusing only on pregnant mothers and failing to examine the factors affecting male partner involvement in PMCHT interventions.

With this background in mind, the present study was conducted to determine the factors accounting for low male partner participation in PMCHT programs. The findings of our study can be helpful in providing initiative recommendations that encourage male partner involvement in the program. Furthermore, our findings would facilitate designing effective strategies targeted toward the reduction of MCT of HIV to have HIV-free children.

Moreover, our study can generate data for other researchers to explore extra evidence regarding the factors associated with poor male partner engagement in PMCHT programs. The findings of this investigation could be also used as baseline information for the study context and other similar settings.

## Materials and Methods

### *Study setting, design, and population*

This community-based cross-sectional study was conducted within June 10-20, 2016 in Bishoftu town, which is located approximately 47 km from Addis Ababa, the capital city of Ethiopia. According to 2007 Ethiopian fiscal year population projection, the estimated total population of the town is 176,743 cases, 51% of which are female population among which 43.39% and 15.68% of the cases are in reproductive age group and pregnant, respectively.

The town has nine kebeles with one general

hospital, three public health centers, twenty six private clinics, two non-government organization clinics, seven pharmacies, five drug stores, and one drug vender. Out of these health facilities, the general hospital, the three health centers, and one of the private clinics provide antenatal care (ANC)/PMTCHT services (8). The study population corresponded to a group of male partners of reproductive age women (15-49 years) who gave birth during the previous year in Bishoftu town. The women who were in the first or second trimester of pregnancy and those with dead or seriously ill partners were excluded from the study.

### **Operational Definitions**

In this study, the male partner involvement in ANC/PMTCHT intervention was defined as high and low, if the subject responded to 4-6 and 0-3 questions correctly (out of six questions), respectively. Furthermore, the respondent was considered to have high and low levels of knowledge about PMCHT programs if correctly answering  $\geq 60\%$  and  $< 60\%$  of the knowledge items, respectively (10). Furthermore, male partners were regarded to have a positive attitude towards PMCHT programs if the attitude measurement score exceeded or equaled to the mean score of a 10-item 5-point Likert scale ranging from 'strongly agree' to 'strongly disagree'; otherwise, they were categorized as having negative attitudes toward this practice.

### **Sample size and selection procedure**

The sample size was estimated as 421 cases using the formula for single population proportion considering 95% confidence interval, 53% proportion of male involvement in PMCHT based on a similar study (11), 5% margin of error, and 10% non-response rate. Prior to data collection, a survey was conducted in all nine kebeles in the town on the male spouses whose wives had visited the facilities delivering the ANC/PMCHT services in the preceding year to prepare a sampling frame. Then, the subjects were selected from nine kebeles in proportion to the size of the study population using the simple random sampling method by means of computer-generated random numbers.

### **Study variables**

The major outcome variable was male partner involvement in the PMCHT programs. The demographic data recorded for each respondent included age, gender, occupation, and monthly household income. In addition, data were recorded about the male partners' knowledge about PMCHT programs, awareness regarding the provision of PMCHT services in the public health facilities, and attitude towards these services.

### **Data collection tool, procedure, and quality control**

The questionnaire consisted of five categories, namely socio-demographic characteristics, knowledge about PMCHT programs, attitude towards ANC/PMCT services, inter-spousal communication (e.g., discussion on HIV counseling and testing), fear of stigma and discrimination, PMCHT information access, socio-cultural factors (e.g., male partner's opinion/perceptions on attending ANC/PMCT programs and pregnancy), health service-related factors (e.g., geographical accessibility of the health facility), flexibility of PMCHT times with regard to the men's occupational activities, waiting time at health facility, and participation in the ANC/PMCHT programs.

Male partner's knowledge about PMCHT services was measured by using 10 items with the minimum and maximum scores of 0 and 10, respectively (12). The scoring of the answer choices ('Yes', 'No', and 'Not known') for item 1 (HIV-infected mother can transmit HIV to her child) was different from that of other items.

The reliability of the 10 items measuring knowledge on HIV/AIDS transmission was estimated rendering the Cronbach's alpha coefficient of 0.72. Male partner participation in PMCHT programs was determined using male participation index obtained by using six items with equivalent weights (12). Some of the items were as follows:

- Did you know about your wife's appointment for ANC the last time she was pregnant?
- Have you discussed with your female mate regarding the receipt of HIV counseling and testing in her previous pregnancy?

The response options were 'yes' and 'no' for

each item. In this study, the Cronbach alpha coefficient for these items was obtained as 0.82.

Attitude was measured based on a 10-item 5-point Likert scale ranging from 'strongly agree' to 'strongly disagree'. The participants' total score in this scale was obtained by summing up the scores of 10 items, and the mean score was used to categorize the respondents (13). In this scale, individual response was rated in a range of 0-3 depending on the weight, and then added to yield the overall score ranging within 0-30.

In the current study, Cronbach alpha coefficient for the attitude scale was estimated as 0.8. The validity of the interview questionnaire was determined using the content validity. The questionnaires were considered as preliminary with regard to literature and the up-to-date similar findings. Data collection was accomplished using a modified, reviewed, pretested, and structured interview questionnaire adopted from the related literature (10-15). The data collection instrument primarily prepared in English was translated to native language (i.e., Afaan Oromo), and then retranslated to primary language via an independent translator to check for its consistency.

Before the actual interview, the ground was made smooth by the selection of a background with no or little disturbance, clarification of the objective of the interviewing, identification of the confidentiality terms, enlightenment of the interview contents, and display of the length of the interview. Actual interview was conducted by asking a single question at a moment, trying not to take sides, giving encouraging responses (e.g., occasional nods of the head and saying "uh huh"), and providing transition between major topics.

The data were collected through structured interviews by nine trained nurses with a diploma degree who were fluent in Amharic and Afaan Oromoo languages. The interviews were conducted individually with the male spouses at their house. Data collection process was supervised by two nurses holding Bachelor's degree. To ensure the quality of the data, appropriate data collection tool was designed and pretested.

Pretesting was performed on 5% of the sample size in Dukem town as it is almost identical to the study setting. Data collectors and supervisors received a one-day training regarding the study objectives, data collection tools, and interview technique, as well as the ways of approaching the potential respondents and keeping confidentiality.

### **Data management, Analysis, and Interpretation**

We manually checked for the completeness and consistency of the data. Data entry was accomplished using the Epi Data 3.1. Data analysis was performed in SPSS software (version 20.0). Descriptive statistics (e.g., percentages, mean, and standard deviation) were computed to summarize the characteristics of the study participants. In addition, bivariate analysis was run to select candidate variables for multivariable analysis. Factors with p-values less than 0.2 in bivariate model were selected for the final logistic regression model to determine the variables significantly associated with male partner participation in the PMCHT services. Furthermore, Pearson's Chi-squared test was employed to evaluate the variation across the categories of variables. Significance level for adjusted odds ratio was adjusted at 95% confidence interval with a p-value of less than 0.05.

### **Ethical Considerations**

The institutional review board of Jimma University Institute of Health, Ethiopia, approved the study protocol. A permission letter was also obtained from the Health Bureaus of Oromia region and Health Administration Unit of Bishoftu town. Additionally, verbal consent was obtained from all participants.

## **Results**

### **Sociodemographic profile of participants**

A total of 405 male partners participated in the interview with a response rate of 96.2%. Nearly half of the male spouses (52.1%) were in the age group of 30-39 years with the mean age of 34.03±5.8 years. Regarding the monthly household income, 174 (43%) respondents

were earning more than 3000.00 Ethiopian Birr (ETB) (Table 1).

**Table 1.** Sociodemographic profiles of study population (n=405)

Variables	n (%)
Age (year)	
20-29	106 (26.2)
30-39	211 (52.1)
40-49	88 (21.7)
Age of marriage (year)	
< 5	143 (35.3)
5-10	186 (45.9)
> 10	76 (18.8)
Educational status	
Uneducated	35 (8.6)
Minimum of reading and writing literacy	42 (10.4)
Primary education	77 (19.0)
Secondary education	112 (27.7)
Academic education	139 (34.3)
Occupational status	
Private employee	122 (30.1)
Government employee	120 (29.6)
Merchant	86 (21.2)
Daily laborer	77 (19.0)
Monthly income (ETB)	
350-1000	74 (18.3)
1001-1599	39 (9.6)
1600-2999	118 (29.1)
3000+	174 (43.0)

**Information source, knowledge, and attitude-related characteristics of male partners**

With regard to male partners' information about the PMCHT services, 235 (58%) cases had heard about such programs. In terms of the information source, 89 (21.9%), 95 (23.4%), and 51 (12.6%) subjects had heard about this intervention from the media (i.e., radio and television), health center/hospital, and urban health extension workers, respectively.

With regard to male partners' knowledge about PMCHT services, almost all 397 (98%) subjects knew that HIV can be transmitted from the infected mother to the child. However, only 316 (78%) participants knew that the utilization of PMCHT service prevents from PMCHT. With respect to the attitude of the partners towards the PMCHT services, 237 (58.5%) respondents had negative attitudes toward these services. The minimum and maximum total scores of the respondents were 21 and 47, respectively, with the mean score of

36.1±4.7.

**Level of Male Partner Participation in the prevention of mother-to-child HIV transmission programs**

Out of the 405 interviewees, 214 (52.8%) cases did not attend to the centers delivering antenatal services with their partners. Furthermore, 207 (51.1%) male partners were tested and counseled for HIV, together with their wives, at clinics delivering ANC. Out of the total participants, 163 (40.2%) subjects were aware of the date of their spouses' antenatal appointment and 400 (98.8%) partners supported their spouses financially for ANC attendance (Table 2).

**Determinants of partner involvement in the prevention of mother-to-child HIV transmission programs**

During the bivariate analysis of partner involvement in the PMCHT services, eleven variables were selected for the final multivariate logistic regression (Table 3). Based on the



multivariate logistic model, the significant predictors for partners' involvement in the

**Table 2.** Male partners' involvement status in antenatal care/prevention of mother-to-child HIV transmission programs (n=405)

Variables	Response n (%)	
	Yes	No
Knowing the wife's ANC appointment	163 (40.2)	242 (59.8)
Discussing with wife regarding HCT in her previous pregnancy	363 (89.6)	42 (10.4)
Ever attending ANC/PMCHT clinic together with the spouse	214 (52.8)	191(47.2)
Ever receiving HCT together with the partner	207 (51.1)	198 (48.9)
Providing financial support to partner to attend health facilities to receive ANC	400 (98.8)	5 (1.2)
Accept to use condom during the wife's pregnancy if recommended by health professionals	228 (56.3)	177 (43.7)

ANC: antenatal care, PMCHT: prevention of mother-to-child HIV transmission, HCT: HIV counseling and testing

**Table 3.** Bivariate analysis of male partner involvement in the prevention of mother-to-child HIV transmission programs and the associated variables

Variables	Male partner involvement		COR (95% CI)	P-value
	High (211) N (%)	Low (194) N (%)		
Age (year)				
20-29	67 (31.75)	39 (20.10)	2.48 (1.38-4.43)	0.002*
30-39	108 (51.18)	103 (53.10)	1.51 (0.91-2.50)	0.10
40-49	36 (17.07)	52 (26.8)	1	
Monthly income				
350-1000 ETB	21 (10.0)	53 (27.32)	1	
1001-1599 ETB	14 (6.64)	25 (12.89)	1.41 (0.61-3.23)	0.41
1600-2999 ETB	59 (27.96)	59 (30.41)	2.52 (1.35-4.69)	0.003
≥3000 ETB	117 (55.4)	57 (29.38)	5.18 (2.85-9.40)	<0.001*
Knowledge on PMCHT				
High knowledge	187 (88.63)	129 (66.49)	3.92 (2.33-6.59)	<0.001*
Low knowledge	24 (11.37)	65 (33.51)	1	
Attitude towards PMCHT services				
Positive attitude	111 (52.61)	57 (29.38)	2.66 (1.77-4.02)	<0.001*
Negative attitude	100 (47.39)	137 (70.62)	1	
Discussing with partner on HCT during the last pregnancy				
Yes	202 (95.73)	161 (83.0)	4.60 (2.13-9.89)	<0.001*
No	9 (4.27)	33 (17)	1	
Ever heard about PMTCHT services				
Yes	152 (72.04)	83 (42.78)	3.44 (2.37-5.21)	<0.001*
No	59 (27.96)	111 (57.22)	1	
Awareness regarding the provision of PMCHT services in public health facilities				
Yes	152 (72.04)	83 (42.78)	3.44 (2.27-5.21)	<0.001*
No	59 (27.96)	111 (57.22)	1	
Being invited for HCT during partner's ANC visit				
Yes	198 (98.84)	121 (62.37)	9.18 (4.88-17.28)	<0.001*
No	13 (1.6)	73 (37.63)	1	
Considering ANC as only women's responsibility				
Yes	33 (15.64)	70 (36.08)	1	
No	178 (84.36)	124 (63.92)	3.04 (1.89-4.88)	<0.001*
Considering pregnancy as only women's issue				
Yes	94 (44.55)	50 (25.77)	1	
No	117 (55.45)	144 (74.23)	0.43 (0.28-0.65)	<0.001*
Distance from the health facility				
≤5 km	197 (93.36)	159 (81.96)	3.09 (1.61-5.95)	0.001*
> 5 km	14(6.64)	35 (18.04)	1	

PMCHT: prevention of mother-to-child HIV transmission, ANC: antenatal care, HCT: HIV counseling and testing

1-Reference category, \* P < 0.05, \*\* P < 0.001

**Table 4.** Multivariable logistic regression model for the predictors of male partner involvement in the prevention of mother-to-child HIV transmission programs

Characteristics	Category	Partner level of involvement	
		COR (95% CI)	AOR (95% CI)
Age (year)	20-29	2.48 (1.38-4.43)	2.94 (1.11-7.77)*
	30-39	1.51 (0.91-2.50)	1.21 (0.58-2.53)
	40-49	1	1
Monthly income	350-1000 ETB	1	1
	1001-1599 ETB	1.41 (0.61-3.23)	1.18 (0.39-3.56)
	1600-2999 ETB	2.52 (1.35-4.69)	1.76 (0.70-4.41)
	>=3000 ETB	5.18 (2.85-9.40)	4.10 (1.50-11.15)*
Knowledge on PMCT	High knowledge	3.92 (2.33-6.59)	2.27 (1.12-4.57)*
	Low knowledge	1	1
Attitude towards PMCT	Positive attitude	2.66 (1.77-4.02)	2.09 (1.20-3.67)*
	Negative attitude	1	1
Awareness of the provision of PMCT services at public health facilities	Yes	3.44 (2.27-5.21)	2.41 (1.27-4.95)*
	No	1	1
Considering ANC as only women's responsibility	Yes	1	1
	No	3.04 (1.89-4.88)	3.96 (2.00-7.81)**

PMCT: prevention of mother-to-child HIV transmission, ANC: antenatal care

1-Reference category, \* P < 0.05, \*\* P < 0.001

PMCT programs included age, monthly income, knowledge on PMCT services, attitude towards PMCT services, awareness of the provision of the PMCT services in public health facilities, and considering ANC attendance as only women's responsibility (Table 4).

According to the results, male partners in the age group of 20-29 years were approximately three times more probable to participate in the PMCT programs, compared to those in the age group of 40-49 years (AOR=2.9, 95% CI: 1.11-7.77, P=0.001). Furthermore, male partners with the monthly income of ≥ 3000 ETB were 4.1 times more plausible to participate in the PMCT intervention in comparison to those with the monthly income of 350-1000 ETB (AOR=4.1, 95% CI: 1.50-11.15, P=0.006). Additionally, the subjects who had a high level of knowledge on PMCT were nearly two times more likely to take part in these programs as compared to the spouses with lower level of knowledge in this regard (AOR=2.2, 95% CI: 1.12-4.57, P=0.025).

The male partners who had a positive attitude towards the PMCT services were two times more probable to partake in the PMCT programs, compared to their counterparts with a negative attitude toward this practice (AOR=2.0, 95% CI: 1.20-3.67, P=0.009). Furthermore, the male partners who knew that

PMCT services were provided in public health facilities were 2.4 times more plausible to involve in these programs, compared to those with no knowledge in this regard (AOR=2.4, 95% CI: 1.27-4.95, P=0.011). Additionally, the partners who did not perceive attending ANC clinic as only women's responsibility were 3.96 times more likely to participate in the PMCT services than their counterparts (AOR=3.96, 95% CI: 2.00-7.81, P=0.001) (Table 4).

## Discussion

As the findings of the present study indicated, 211 (52.1%) male partners involved in the PMCT programs with a high male involvement index. This finding is dissimilar when compared to a study performed in Addis Ababa, Ethiopia, 28.1% of the male partners (i.e., about one case per four males) had a high participation in these programs (14). Similarly, in a study carried out in Uganda, Ethiopia, 26% of the participants had a high level of involvement in the PMCT programs (15). This dissimilarity can be due to the variation in the background of the participants and the time interval, as well as the consideration given to PMCT nowadays. However, this result is in line with those of a study conducted in the Southern part of Ethiopia reporting 53% male partner involvement in the PMCT services (16).

This study facilitated the identification of a number of predictors associated with male participation in the PMCHT programs. These predictors included age, monthly income, knowledge on PMCHT, attitude towards PMCHT services, awareness regarding the provision of the PMCHT services in public health facilities, and sociocultural factors (i.e., considering ANC attendance as female's responsibility).

According to our findings, male partners within the age group of 20-29 years were nearly three times more likely to participate in the PMCHT, compared to those in the age group of 40-49 years. This result was consistent with those of a systemic review conducted in Ethiopia showing that younger men had more willingness to take part in the PMCHT services than the older ones (17). Likewise, in a study conducted in Gondar town, Ethiopia, the male participation level in HIV counseling and testing was found to be higher among younger male partners, compared to that in the older ones (18). This might be due to increased communication between partners and information access in the young age groups.

In the current study, the knowledge level of the participants showed a statistically significant association with male participation in the PMCHT programs. About 78% of the participants had a high level of knowledge on PMCHT. Moreover, the male partners with high knowledge in this regard were 2.2 times more probable to involve in these programs than those with lower knowledge.

Similarly, in other studies participants with a high level of knowledge on PMCHT services, partners with high knowledge were 14% and 16% more likely to partake in the PMCHT services, compared to those with a lower level of knowledge (14,18). Moreover, this finding was consistent with the results of a study carried out in the Northern part of Ethiopia reporting that male partners with good knowledge on PMCHT were more plausible to take part in the PMCHT programs (AOR=3.2, 95% CI: 1.294-7.9) (13,18).

In the current study, male partners who knew about the provision of PMCHT services at public health facilities (i.e., who had information on PMCHT services) were 2.4 times more likely to involve in the PMCHT programs, compared to

those without such information. In a study performed in Eastern Uganda, study participants who had previously heard about the PMCHT services were 2.6 times more probable to participate in such services (AOR=2.6, 95% CI: 1.01-6.7,  $P<0.05$ ) (18). The plausible justification for this finding may be this issue that the information the partners had about PMCHT may have helped them to figure out the benefits of PMCHT for themselves and their newborns, thereby increasing their participation.

This study revealed that 168 (41.5%) male partners had positive attitudes towards PMCHT services, whereas 237 (58.5%) subjects had negative attitudes in this regard. Accordingly, a significant association was obtained between the attitudes of male partners and their involvement in the PMCHT programs. In this respect, the male partners who had positive attitudes towards PMCT services were two times more probable to participate in these interventions than those with negative attitudes toward this practice. In a study conducted in Cameroon, Central Africa, 326 (84.9%) men had positive attitudes toward PMCHT, whereas 58 (15.1%) cases showed negative attitudes in this regard (19).

In the current study, traditional beliefs showed a significant relationship with male participation in the PMCHT programs. Male partners who did not perceive attending ANC clinic as only women's responsibility were nearly four times more likely to participate in such programs. This finding is in agreement with the results reported in a review performed in Sub-Saharan Africa revealing that giving support and care are equally perceived as a traditional women's task.

In Tanzania, East Africa, a social custom bans males from visiting the health services related to females. Furthermore, in this country, there is a prevalent attitude not categorizing maternal health as part of the male's responsibility. These issues have led to the hindrance of male participation in PMCHT programs. Studies carried out in Cameroon and Burkina Faso (West Africa) indicated that antenatal procedures were not supposed as part of male's responsibility by many fathers (20). In another systemic review conducted in Africa, ANC was reported to be



considered as a woman's responsibility, and it was therefore dishonorable for a man to visit such settings (21).

One of the limitations of this study is the likelihood of the presence of social desirability bias due to the sensitivity of the issue and cross-sectional nature of the study, which fails to show causal relationships. Regardless of this drawback, the present study adds valuable information to the literature regarding the knowledge and attitudes of male spouses toward participating in the PMCHT programs. Accordingly, our findings could enlighten the health service managers to develop a strategy targeted toward the enhancement of male involvement in the PMCHT programs in Ethiopia.

### Conclusion

The findings of the present study revealed that male partner involvement in the PMCHT programs was not at a satisfactory level. However, this rate seems moderate when compared to those reported in other similar studies conducted in Ethiopia. The independent factors accounting for male partner involvement in the PMCHT programs included partner's knowledge and attitude towards PMCHT programs, awareness regarding the delivery of PMCHT services in public health facilities, and considering ANC attendance as only women's responsibility. Therefore, it is highly recommended to improve male involvement level in the PMCHT services through considering these factors.

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### Conflicts of interest

The authors declare no conflicts of interest

### Authors' Contribution

W. S. developed and articulated the research question, and formulated the study design, W. S. organized the data collection, performed analysis, and drafted the paper. W. S., D. H., and T. S. ran the analysis, revised the paper for scholarly content, and read and approved the

final version.

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