

Assessment of Male Partner's Involvement in Prevention of Mother-to-Child Transmission of HIV and Associated Factors Among Males in PMTCT Services

Addis Adera^{1,*}, Mesfin Wudu¹, Yonas Yimam¹, Markos Kidane², Ambachew Woreta³, Tigabu Molla⁴

¹Department of Nursing, Faculty of Health Sciences, Woldia University, North Wollo, Amhara Region, Ethiopia

²Department of Economics, Faculty of Business and Economics, Unity University, Addis Ababa, Ethiopia

³Department of Biology, Faculty of Natural and Computational Sciences, Woldia University, North Wollo, Amhara Region, Ethiopia

⁴Department of Economics, Faculty of Business and Economics, Woldia University, North Wollo, Amhara Region, Ethiopia

Email address:

addisaderagebru@gmail.com (G. A. Addis)

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Abstract: Background: Maintaining an adequate and safe Prevention Mother-to-Child Transmission of HIV services and male partner's involvement in PMTCT services are an issue of concern to local health planner especially with increase in population size and an increase in the number of medical facilities. Objectives: To describes whether methodological issues such as sample Characteristics, Outcome measures, and mechanisms causing change in the outcome measures could explain some of the inconsistent findings evident on. Methods: This review bases peer reviewed journal articles on "Assessment of Male partner's involvement in Prevention of Mother-to-Child Transmission of HIV and Associated Factors among Males in PMTCT services." which are published between Sep, 2009 and February, 2015. Key words such as "Male partner", "PMTCT", "Male involvement", "ANC", "MTCT", and "HIV" were used to search the articles from different websites. A total of 106 articles were obtained. Then titles, summary or abstract, and the whole body of each of the articles were checked for their relevance to be included in the analyses. Finally, a total of 19 articles were found to be eligible to be included in the analyses. In this regards, we searched databases of MEDLINE, Pub Med, Elsevier, Google, BMC, PMC, and Psych Info search Engines. Result: From 106 identified studies, 19 met the inclusion criteria. The majority of the studies 7 (37. 1%) identified the determinants of male partners' involvement in maternal and child health activities, focusing specifically on HIV prevention of maternal to child transmission (PMTCT) in Africa. Most of the reviewed articles 6 (31. 6%) selected a minimum sample size of 100 (20%) participants However, five of the total reviewed articles (26. 3%) were selected the maximum sampled size of 500 participants. The study result reviewed studies sought to generalize from the mentioned articles by identifying a wide variety of male partner's involvement in PMTCT services and associated factors in PMTCT in Africa. Conclusion: Many challenges to increase male involvement in PMTCT (1) enhance male participation in the process, the adherence rate of mothers towards PMTCT care and support was fair, highlight the male participation in PMTCT programs, and male partner involvement in ANC/PMTCT is low. Male partner's involvement in PMTCT services is a well-accepted issue and has important positive outcomes on several of health discipline.

Keywords: Male Partner, PMTCT, Male Involvement, ANC, MTCT, HIV

1. Introduction

The most common route of transmissions for these infants is transmission from mother to child (MTCT) which occurs in up to 90% of cases (1). Male participation in child

–bearing decisions is crucial and also has a positive impact on the acceptability of PMTCT interventions (2, 3). Without intervention, HIV can infect 25-45% of birth from HIV –

positive mothers during pregnancy, delivery and/or breast feeding in developing countries and the efficacy of ARV drugs has been shown (4, 5). World health organization (WHO) promotes prevention of HIV infection, unintended pregnancies, perinatal HIV infection and providing care and support for HIV positive mothers and their families (6). Similar to other resources-poor nations facing the integration of PMTCT into routine pregnancy and infant care, efforts in South Africa to scale up PMTCT and reduce transmission to <5% have fallen far short of the United Nation's goal of 50% reduction in pediatric HIV by 80% coverage of mothers (7). Involving male partners in ANC /PMTCT can often be utilized as an entry point for the provision of additional PMTCT services notably feeding testing, condom use and infant feeding recommendations for both male and female participants (8). Studies have shown that the utilization of PMTCT services by the pregnant women is influenced both by factors related to the health system such as accessibility of VCT services, and by individual factors such as fear of disclosures of HIV result, lack of male partners support, fear of domestic violence, abandonment and stigmatization (9, 10, 11). Involvement of male partners in their partner's PMTCT program, in Tanzania and Kenya, led to more HIV infected women receiving Nevirapine during their antenatal follow up visits, adherence of breast feeding in their babies, adherence to infant feeding condom use than those whose partners were not involved (12). The proportion of pregnant women attending antenatal care whose male partners were tested for HIV was 5% in 2008 versus 2% in 2007 (13). Mothers-to-Child transmission (MTCT) is the most common route of HIV infection for HIV positive children under five years. It believed that with effective PMTCT interventions, MTCT can be reduced to levels below 5% (14). Men have a lot of power attached to their status in the family and the wider society. However, these attributes have become part of the barriers to male involvement in the uptake of PMTCT and low Utilization (15). Patient and health system factors are critical in determining success of PMTCT goals (16, 17). Providing highly active antiretroviral therapy to a woman will reduce viral replication and viral load during pregnancy, and as a post exposure prophylaxis, prevention infection in a new born (18, 19). 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 (20). The main Purpose of this to describes whether methodological issues such as sample Characteristics, Outcome measures, and mechanisms causing change in the outcome measures could explain some of the inconsistent findings evident on male partner's involvement in PMTCT services and factors which affects in PMTCT services.

2. Methods

A review of the research literature is conducted in the

area of Male partner's involvement in Prevention of Mother-to-Child Transmission of HIV and Associated Factors among Males in PMTCT services. The PUBMED, Ovid, Elsevier, Google Scholar, BMJ, MEDLINE, Science Direct and Web data was searched. This method used to determine the accuracy of the result by checking related articles with these various sources. This review based on peer review journal articles on "Assessment of Male partner's involvement in Prevention of Mother-to-Child Transmission of HIV and Associated Factors among Males in PMTCT services" which are published between Sep, 2009 and February, 2015 Because recent information and up to dated data was important to justify the reviewed and to addressed the objective of the review articles. After assessing all contents, titles, summary /abstracts, and full texts of articles, by excluding redundancy; meanwhile the relevancy of them to address the objectives of this study have been considered and evaluated. The term which was used for searching related articles "Male partner", "PMTCT" , "Male involvement", "ANC", "MTCT", and "HIV" combined were used to search the articles from different websites. A total of 106 articles were obtained. Then titles, summary or abstract, and the whole body of each of the articles were checked for their relevance to be included in the analyses. Finally, a total of 19 articles were found to be eligible to be included in the analyses. The Authors conducted a reading of titles and made the decision to include articles in the review regarding the following criteria. The study included one or more instruments to gather information on Assessment of Male partner's involvement in Prevention of Mother-to-Child Transmission of HIV and Associated Factors among Males in PMTCT services. Articles published between Sep, 2009 and February, 2015, those with and those published in English were eligible for the analysis. Studies that didn't match criteria were excluded. Finally, given that some of the studies reviewed compare the previous activities Male involvement in PMTCT services with samples of all male partner's from different Health setting in worldwide identify characteristically implementation of PMTCT service in different health Institutes. All abstracts were eliminated from further consideration. For example, The titles, summary or abstract, and the whole body of each articles were then checked for their relevance and suitability to be included in the analyses were found to be eligible (Table 1). Formerly, we used the effective public health practice project quality Assessment Tool (EPHPP) (21). To assess the quality of quantitative research in this review. This instrument had ordinal scoring for the following components: Selection bias, study design, confounders, blinding, data collection methods, withdrawals and dropouts. Each components was rated strong, moderate, or weak and these ratings were also combined into a global quality rating (Strong, moderate or weak). Six reviewers assessed the quality, and discrepancies were resolved by discussion.

3. Result

Out of 19 reviewed studies, 7 (37. 1%) identified the determinants of male partners' involvement in maternal and child health activities, focusing specifically on HIV prevention of maternal to child transmission (PMTCT) in Africa (22, 27, 29, 30, 31, 34, 36). Three studies (15. 9% assessed male involvement in prevention of mother-to-child transmission of HIV and associated factors among male partners in Africa (32, 38, 40); two studies (10. 6%) described male involvement in programs for preventing mother-to-child transmission (PMTCT) in Africa (28). The remaining seven studies (37. 1%) explored the views of participants on the factors that encourage, inconvenience or inhibit them in accompanying their wives to the ANC clinic (23), pointed out the role of male partner involvement on mother's adherence to PMTCT care (24), evaluated knowledge, attitude, communication behaviors among partners, awareness, and how they affect the uptake of the PMTCT services (25), investigated factors that affect access to and utilization of maternal and child health (MCH) and PMTCT services among women (26), hypothesized that male partner HIV-1 counseling and testing during pregnancy 33), partner involvement and the uptake of prevention of PMTCT of HIV (PMTCT) interventions (35), and both explored and described male partner involvement in PMTCT services (39) respectively. The majority of reviewed articles 7 (36. 8%) were conducted in 2014 (23, 24, 29, 31, 32, 36, 39), followed by 3 (15. 8%) were conducted in 2013 (28, 35, 40) and 3 (15. 8%) were conducted in 2012 (22, 33, 37). Two studies (10. 6%) were conducted in 2011 (25, 27) and 2 (10. 6%) were also conducted in 2010 (30, 38). The remaining two studies (10. 6%) were conducted in 2009 (34) and 2015 (36) respectively. The studies included were all from developing countries (Africa). Five of the developing countries (26. 3%)

were conducted in Ethiopia (24, 26, 16, 19), Two in South Africa (36, 41), Sub-Saharan Africa (22, 28), Zambia (23, 29), Tanzania (25, 34), and Uganda (30, 40). The rest of the countries had one study in each : Malawi (31), Kenya (26), and Cameroon (33). Most of the included studies were non-interventional studies: Five were interview studies (23, 25, 27, 28); two studies were descriptive (26, 34), two were studies qualitative and Quantitative (9, 17); two were studied FGD and Interview (8, 16);and the remaining five were studies literature based review, (22), Randomized control trials (33), Retrospective cohort study (35), case control study (36), and institutional based CSS (40) respectively. The majority of the reviewed articles (31. 6%) selected a minimum sample size of 100 (20%) participants (22, 23, 28, 31, 37, 39). However, five of the total reviewed articles (26. 3%) were selected the maximum sampled size of 500 participants (26, 27, 32, 33, 35). The next 15. 9% selected a sample size of 400 (80%) participants (3, 9, 17) and 15. 9% selected a sample size of 300 (60%) participants (29, 36, 40). The remaining studies of (10. 6%) had selected a sample size of 200 (40%) participants (4, 1). Most of the included studies 9 (34. 3%) were cross sectional study (24, 26, 27, 29, 30, 32, 34, 38, 40), followed by 2 (10. 5%) were interviews and data from National (23, 33); 2 (10. 5%) were case control study (25, 36). However the remaining reviewed studies (31. 8%) were literature reviewed (22), Exploratory qualitative research design (25), an interrogative review (28), Formative study (35), and Exploratory descriptive (18). The majority of the included studies 7 (36. 8%) were used simple random sampling method (31, 32, 33, 34, 36, 38, 39), followed by systematic Random sampling method 5 (26. 8%) (24, 25, 27, 29, 40) . The result shows that both data extraction and purposive , non probability sampling method were used as similar rates (23, 30, 37). Only one study (5. 3%) was used staged cluster sampling method (26).

Table 1. Distribution of studies based on purpose, design, sample size, sampling method and place conducted.

Author/s and years	Country And study setting	Purpose	Sample size	Method	Types of study/ design	Sampling method
Detekema et al., 2012	Sub-Saharan Africa	To identify determinants of male partners' involvement in MCH activities, focusing specifically on HIV prevention of material to child transmission (PMTCT) in sub- Saharan Africa.	34 studies	Literature review	Literature review	Data extraction
Auvinen et al., 2014	Lusaka, Zambia, East Africa	To explore the views of Luba-kasai men, living in Zambia in the Lusaka Province, on the factors that encourage, inconvenience or inhibit them in accompanying their wives to the ANC clinic and their ideas to improve their experience.	21 interviewees	Interviews and data from the National protocol guidelines of Zambia	Interview and data from the national protocol guide line	Purposive non probability
Alemayehu et al., 2014	Health Centers, Tigray Region, Northern Ethiopia	To point out the role of male partner involvement on mother's adherence to PMTCT care and support in Tigray, Northern Ethiopia.	326 HIV positive pregnant women	Qualitative methods of data collection	Cross-sectional study	Systematic random sampling
Akarro et al., 2011	Ilala Municipality, Dar salaam region,	To evaluate knowledge, attitude, communication behaviour among	192 study units	In-depth interview	Case study	Systematic random

Author/s and years	Country And study setting	Purpose	Sample size	Method	Types of study/design	Sampling method
	Tanzania	partners, awareness , and how they affect the uptake of the PMTCT services are among the factors considered				sampling
Awugafac et al. , 2015	Tiko health district, South West Region of Cameroon	To investigate factors that affect access to and utilization of material and child health (MCH) and PMTCT services among women in Tiko Health District	436 women	descriptive	Cross sectional study	Two stage cluster sampling method
Haile and Brhan . , 2014	Mekelle town health facilities , Tigray, Ethiopia	To determine the level of male partner involvement in PMTCT and factors that affecting it.	473 pregnant mothers	Interview	Cross sectional study	Systematic random sampling
Auvinene et al. , 2013	Sub-Saharan Africa	To describe male involvement in programmes for preventing mother-to-child transmission (PMTCT) in sub-shran Africa.	18 Articles	An Interrogative review	An integrative study	Data retrieved from the PUB Med and Medlin data base
Matongo. , 2014	ChibombRegional Refreal Hospital Bungokho, Uganda	To determine factors that influence male involvement in PMTCT programs in chibombo district of central province in Zambia	240 male participants	Focused group discussion and interview	Cross sectional study	Systematic Random Sampling
Byamugisha et al. , 2010	Mbale regional Refreal Hospital, Bungokho, Uganda	To determine the level of male involvement and identify its determinants in the PMTCT programme.	338 men	Qualitative and quantitative	Cross sectional study	Purposively
Nyondo et al. , 2014	South Lunzu Health Centere (SLHC) in Blantyre, Malawi	To identify the factors that promote and those that hinder Male involvement in PMTCT services in antenatal care services in Blantyre, Malawi	18 men and 17 pregnant women	A part of formative study on Exploratory qualitative	Formative study	Randomly selected
Abuhay et al. , 2014	Sixteen Districts in Addis Ababa, Ethiopia	To assess male involvement in prevention of mother-to-child transmission of HIV and associated factors among male partners in Addis Ababa.	431 male participants	Qualitative method	A community based cross sectional study	Multi-stage sampling simple random sampling
Osoi et al. , 2012	Ahero , Kenya	Hypothesized that male partner HIV-1 counselling and testing during pregnancy can be increased by offering couple HIV_1 counselling and testing (CHCT) at home.	495 pregnant women	Randomized controlled trial	Interview	Random sampling
Boniphace, Y. , 2009	Hedaru Ward in same district;Kilimanjaro, Tanzania	To determine willingness and participation toward presentation of MTCT (PMTCT) among males of reproductive age in Hedaru ward at same district; Kilimanjaro Region.	138 male of reproductive age	Descriptive study	Cross sectional study	Randomly selected
Kalembo et al. , 2013	Mwanza District hospital , south – East of Lilongwe, Malawi	To examine the association between male partner involvement and the uptake of prevention of PMTCT of HIV (PMTCT) interventions.	476 HIV positive women	Retrospective cohort study	Cohort study	Retrieved from patient card
Mnyanietal. , 2014	Soweto, Johannesburg, South Africa	To identify the key patient cantered risks for MTCT in a high HIV prevalence setting in Johannesburg, South Africa.	77 women with HIV infected infants ;154 with uninfected infants	Case control study	Case control study	Randomly selected
Adedimeji et al. , 2012	Arba Minch , Gamo Gofa Zone,	To highlight and describe unique contextual factors contributing to low	10 participants	In-depth interview and	Exploratory qualitative	Purposive

Author/s and years	Country And study setting	Purpose	Sample size	Method	Types of study/design	Sampling method
	SNNRSouthern, Ethiopia	utilization of PMTCT services in Arba -Minch, Ethiopia		focus group discussion	research design	
Perez, M. , 2010	Luzira's prisons custodial staffs, Kampala , Uganda	To assess individual, core prison services and health services factors that influence male involvement in PMTCT programs among Luzira's prisons custodial staffs.	343 male custodial staffs	Qualitative and quantitative	Cross sectional study	Randomly selected
Jeewa. Z. , 2014	Primary health care facility in Kwazulu-Natal, South Africa	To explore and describe male partner involvement in PMTCT services in a selected primary health care facility in Kwazulu-natal.	90 men	A qualitative exploratory descriptive design	Exploratory descriptive	Randomly selected
Abajobir and Zeleke. , 2013	ANC Clinic at Hawassa University, Referral Hospital, Ethiopia	To assess the knowledge, attitude, practice and factors associated with prevention of mother-to-child transmission of HIV/AIDS among pregnant mother attending antenatal clinic.	238 ANC attendees	An institution based cross sectional study	Cross sectional	Systematic random sampling

Out of 19 reviewed studies 8 (42. 2%) were included in their studied participation when the male partners of pregnant women attending ANC and under five clinics, their involvement in PMTCT services and men aged 18 years or more, whose spouses were attending ANC (22, 23, 28, 29, 30, 32, 34, 39). Four of the reviewed articles (21. 2%) were included participants in their studies regarding women of reproductive age selected from study areas, with the communities and at the health facilities offering ANC and PMTCT services. All information about participants inclusion criterion in all of selected reviewed article show in (Table 2). As shown in table 2, these reviewed studies sought to generalize from the mentioned articles by identifying a wide variety of male partner's involvement in PMTCT services and associated factors in PMTCT in Africa. These results show the different instruments used to measure male partners involvement and factors which affects in PMTCT services. a structured and pretested self administrated and interview questionnaire, which accounted for 60% of articles on male partner's involvement in PMTCT services and various factors affects in PMTCT service in Africa measurement were the most commonly used strategy 24, 25, 26, 27, 30, 31, 32, 36, 37, 38, 39, 40), followed by various measurement in each of the remaining studies such as semi structured questionnaire (10. 6%) (29, 34), Interview questionnaire and guideline (10. 6%) (23, 25), Data baseline (5. 3%) (22), Published articles /secondary data (5. 3%) (28), and underwent smart phone audio computer assisted self interview (5. 3%) (33). The majority of the reviewed studies8 (42. 4%)were used descriptive and multivariate logistic regression (24, 25, 27, 29, 32, 35, 36, 38) followed by 2 (10. 6%) were used qualitative inductive content analysis (23, 28) . Two reviewed studies (10. 6%) thematic content analysis (31, 37), and 2 (10. 6%) were used EPI-Info computer software (34, 39). The remaining studies 5 (42. 4%) were used

Literature review (22), statistical analysis (26), EPIDA TA (30), and univariate , Bivariate and multivariate analysis (40) were used as data analysis in this reviewed article respectively. The majority of reviewed studies 9 (47. 7%)were used ($p < 0. 05$) for a significance of the study (24, 24, 29, 32, 33, 35, 36, 38, 39), followed by 4 (21. 25) were not used any P-value to measure statistical significance. Two studies (10. 6%) were measured their result with $P = 0. 05$ during identified significance of the study. However, the remaining four studies (21. 2%) were used odds ratio with 95% CI (27), the developed themes were verified repeatedly against the digital recordings (31), association between certain variables of interest and male involvement (39), and relevant vibration quotes are reported to aid in the interpretation of the data (37). The result showed a significant relationship between knowledge, attitude and follow up to uptake of PMTCT serious were observed and the communication barriers between pregnant women and their husband /partners are the limiting factors of follow up to uptake and utilization of PMTCT services. The participants had a mean age of 35 years , and the age was not statistically significant ($P = 0. 353$), factors such as education, and knowledge of PMTCT had an association with programmes (25, 28, 29). Knowledge, income, cultural beliefs were significantly predictor of male's involvement in the prevention of mother-to-child transmission of HIV and from the total respondents, only 121 (28. 1%) of males had high involvement in PMTCT, Younger men and those with a higher education were more willing to be involved than those who were older or those with a lower level of education (32, 37, 38, 39, 40). Haile and Brhan (2014) determined the level of male partner involvement in PMTCT services which 20% of pregnant mothers have been accompanied by their male partner to the ANC /PMTCT services (27, 30). In addition, Knowledge of HIV sero status maternal willingness to inform their husband about

the availability of VCT services in ANC/PMTCT and previous history of couple counseling were found to be the independent predictors of male involvement in ANC /PMTCT services (27, 30, 34). This reviewed result also indicated that the majority of studies defined male participation as male involvement solely during antenatal HIV testing (22), lack of knowledge, motivation, fear of death, socioeconomic circumstances and gain the arrangements and working culture at the clinic were held as inhibiting factors, the factors that would potentially promote male involvement were categorized into community, health facility and personal or family level factors (22, 23, 31). The findings were based on adherence rate of mothers towards PMTCT care and support was 84.9%. The result was also indicates that HIV positive pregnant mothers with better male involvement had 8 times more odds to adhere to PMTCT care and support as compared to their counterpart (24). Osoti et al (2012) and Kalembo et al (2013) were hypothesized that male partner HIV-1 counseling and testing during pregnancy can be increased by offering couple HIV-1 counseling and testing (CHCT) at home and toward PMTCT among males of

reproductive age were found that male partners were significantly more likely to be reached by home based (88%) than clinic based (37%) CHCT ($p < 0.001$). HIV-1 prevalence was 16% in both men and women tested and male partner involvement was significantly associated with condom use. In addition, 3.7% had a male partner involvement while 86.3% had no male partner involvement (33, 35). The majority of this reviewed studies 6 (31.8%) were concluded about their finding; level of male involvement in PMTCT programs was associated with knowledge of PMTCT (24, 34, 36) and structured and cultural barriers to men's involvement in the PMTCT program were complex and interrelated (30, 31, 32). Both stigmatization is singled out as a matter to be addressed and the uptake of MCH/PMTCT services was high in the study (25, 26, 35, 37). The remaining studies (26.5%) were concluded as follow: many challenges to increase male involvement in PMTCT (22), enhance male participation in the process (23), the adherence rate of mothers towards PMTCT care and support was fair (24), highlight the male participation in PMTCT programs (28), and male partner involvement in ANC/PMTCT is low (27).

Table 2. Distribution of studies based on instruments, participants, data analysis and results.

Author/s and years	participants	Instruments	Data analysis	P-value	Result
Detekema et al., 2012	Male partners of pregnant women attending antenatal and under five clinics. -The male partner may be the baby's father or not.	Data bases	Literature Review	NA	- Male participation as male involvement solely during antenatal HIV testing
Auvinen et al., 2014	Luba –Kasai men who were either refugees from the democratic republic of the Congo or descendants of Congolese Refugees.	Interview questionnaire and Guideline	Twenty-one Interviews were analyzed using qualitative inductive content analysis and deductive content analysis	NA	A lack of motivation, fear of death socioeconomic circumstances and gain the arrangements and working culture at clinic were held as inhibiting factors
Alemayehu et al., 2014	Among HIV positive pregnant women attending ART	Structured and pre tested questionnaire	Entered into cleaned in EPI Data version 3.1 and using SPSS 20 for windows, Descriptive and multivariate logistic regression	A p-value of less than 0.05 was set for the significance of estimates	The adherence rate of mothers towards PMTCT care and support was 84.9%. HIV positive pregnant mothers with better male involvement had 8 times more odds to adhere to PMTCT care and support as compared to their counterpart
Akarro et al., 2011	Questions relating to uptake of PMTCT and associated factors such as outlined in the introduction were asked	Structured, administered questionnaire and in-depth interviews	Using SPSS chi-square test and logistic regression modules	P-value of <0.05	A significant relationship between knowledge (Attitude and follow up to the uptake of PMTCT services were observed. The communication barriers between pregnant women and their husband/partners are the limiting factors of follow up to uptake and utilization of PMTCT services.
Awugafac et al., 2015	Women of reproductive age selected from two settings. With n the communities and at the health facilities offering ANC and PMTCT services in the Tiko Health District	Administered face to face interviews	Entered and analyzed with Epi-Info statistical software version 3.5.	Relationships between the variables were established using the chi-square test at $P=0.05$	98.4% of them attended antenatal (ANC) during their most recent pregnancy. No education and acquisition of primary education was associated with better male partner involvement in PMTCT
Haile and Brhan., 2014	Pregnant mothers who were attending antenatal care (ANC/PMTCT) at five randomly selected health	Interview administered structured Interviews	Entered into EPI software version 3.5.2, edited, cleaned and analyzed using	Odds ratio with 95% confidence interval	20% of pregnant mothers have been accompanied by their male partner to the ANC/PMTCT services.

Author/s and years	participants	Instruments	Data analysis	P-value	Result
Auvinene et al. , 2013	facilities (4 HCs and 1 Hospital in Mekelle, Northern, Ethiopia. Male participants who are involved and prevented of PMTCT of HIV in Sub-Saharan Africa	Published articles from PubMed, MEDLINE data bases (Secondary Data)	SPSDS Version 16.0; Multiple logistic regression. Qualitative content analysis	NA	Men had positive attitudes towards PMTCT programmes. Barriers to male involvement were identified.
Matongo. , 2014	Male participants whose partners either had or had not attendd ANC and PMTCT programs	Semi structured questionnaire and from six focused group discussion (FGDS)	Entered into Epi – Info Software Version 3. 5. 2; using SPSS 20; and Multiple logistic regression	P-value of <0. 05	A mean age of 35 years, and the age was not statistically significant (P=0. 353); factors such as education and knowledge of PMTCT had an association with men's willingness to attend PMTCT program
Byamugisha et al. , 2010	Men aged 18 years or more, whose spouses were attending ANC at Mbale regional Hospital, was conducted in Mbale district, Eastern Uganda.	Pretested , structured , interview-administered questionnaire	Entered using EPIDATA; SPSS version 13	P-value =0. 05	A low male involvement index and only 5% of men accompanied their spouses to the antenatal clinic.
Nyondo et al. , 2014	Both men and women participants were conveniently sampled and recruited with assistance from health care workers and ease of access of potential study participants.	Six face to face key informant interviews (KIIS) with health Care workers and FGDS	Thematic content analysis; NWVO version 9. 0	The developed themes were verified repeatedly against the digital recording	Lack of knowledge of MI in PMTCT; the factors that would potentially promote male involvement were categorized in to community, health facility and personal or family level factors.
Abuhay et al. , 2014	Male partners whose female partners were attending ANC/PMTCT services in the selected districts six months prior to the study.	Pretested and structured questionnaire	SPSS version 16. 0 statistical package; Multiple logistic regressions and manually using thematic approach	P-value of less than 0. 05	Knowledge , income , cultural beliefs , and occupation of the participants were significantly predictor of male involvement in the prevention of mother to child transmission of HIV. From the total respondents , only 121 (28. 1%) of males had high involvement in PMTCT
Osoti et al. , 2012	Enrolled women underwent Smartphone audio computer assisted self- interview (ACASI) followed by random assignment in blocks of 20 and ratio of 1:1 to home-based or clinic based CHT and HIV-1 testing.	Underwent Smart phone audio-computer assisted self – interviews (ACASI)	Proportion of male partners who underwent CHCT; relationship stability and intimate partners violence (IPV)	P-value of < 0. 05	Male partners were significantly more likely to be reached by home-based (88%) that clinic based (37%) CHCT9P<0. 001).
Boniphace, Y. , 2009	Males of reproductive age	Semi-structured questionnaire with both closed and open ended questions	EPI-info computer software	NA	74. 6% of participants were not willing to participate in PMTCT programs by accompanying their couples to ANC clinics.
Kalembo et al. , 2013	Women, their male partners and their children who were enrolled in a PMTCT program	Routine PMTCT program Implemented according to National Guidelines	Descriptive statistical , chi-square test and logistic regression	P-value of <0. 05	Male partner involvement was significantly associated with condom use. 13. 7% had a male partner involvement while 86. 3% had no male partner involvement.
Mnyani et al. , 2014	HIV-infected women with HIV- infected (Cases) and uninfected (Controls) infants diagnosed around six weeks of age as part of routine ,	Structured questionnaire	Stata version 12. 0 (stata corporation, college station, USA), Descriptive and multivariate	P-value of <0. 05	HIV uninfected infants were diagnosed at a mean age of 6. 0 weeks (SD=0. 2)

Author/s and years	participants	Instruments	Data analysis	P-value	Result
Adedimeji et al. , 2012	early infant diagnosis Antenatal clinic attendees , health workers health facilities in the study area	Interviews and discussion groups	logistic regression NVIVO Version 9 for qualitative ; thematic frame work	Relevant vibration quotes are reported to aid in the interpretation of the data	Awareness of PMTCT services and knowledge of its benefits was really universal, lack of appropriate follow up mechanisms and inadequate access to ARV drugs.
Perez, M. , 2010	Males custodial staffs married and aged between 18 and 60 years, with a last one child of not more than 10 years of age.	Intervieradmi nstedred questionnaire	EpiData 2. 1 (b)- qualitative data , stata software version 10/1c and logistic regression as a statistical methods	P-value of 0. 05	T Factors that enhanced male involvement in PMTCT were having tested for HIV.
Jeewa. Z. , 2014	Men who are attended in primary health care facility in Kwazulu-Natal.	Intervieradmi nstedred questionnaire	Association between certain variables of interest and male involvement	Association between certain variables of interest and male involvement	Most of the participants indicated that they were aware of the PMTCT program.
Abajobir and Zeleke. , 2013	Pregnant women who were attending ANC clinic	Structured interview administered questionnaire	Epi info and analyzed by using SPSS software for windows; Univariate , Bivariate and Multivariate analyses	P-value of <0. 05	82. 3% mother knew about prevention of mother-to-child transmission of HIV and 97. 4% had good attitude towards it. ANC visit of four and above for the current pregnancy found to have statistically significant association.

4. Discussion

The above results demonstrate that factors which affects male involvement in PMTCT services in Africa. The earliest study was reported in 2009 (13), and the most recent study was reported in 2015 (5). This section (1) discuss the characteristics of male partner's involvement in PMTCT services in Africa, (2) explores the view of male partner's on the factors that encourage, inconvenience or inhibit them in accompanying their wives to the ANC clinic, (3) describes instruments used to measure male partner's involvement in PMTCT services and various factors which affects PMTCT services, (4) effects of PMTCT services, (5) describes the role of male partner involvement on mother's adherence to PMTCT care support in Africa. We identified only 19 studies , the majority of them (64%) analyzed the determinants of male partner's involvement in MCH activities, focusing specifically on HIV prevention of maternal to child transmission (PMTCT) in Africa, and knowledge , attitude, practice and factors associated with PMTCT of HIV among pregnant mother attending ANC. A similar study was conducted by Matongo, LH (2014) and Byamugisha et al (2010) who are explored determinants of male involvement in PMTCT programs in Chibombo district of central province of Zambia. When male partner's take part in the prevention of mother –to-child transmission (PMTCT) of HIV , their knowledge to HIV increases, they become supportive to their partners and their response to HIV testing improves (41, 42). Auvinen et al (2014) found that male participation in the prevention of mother-to-child transmission (PMTCT) of HIV has been determined as one of the key factors in sub-sharan African

countries (43). This research showed that the majority of reviewed studies were used simple random sampling method . In addition, the subjects, who had enrolled in the reviewed studies, were male partners of pregnant women attending ANC and under five clinics, their involvement in PMTCT services, and men aged 18 years or more whose spouses were volunteer participation. The outcome measurements were accurate. Perhaps using non-random sampling methods in selecting participants for determinants of male involvement in PMTCT services should not be considered in future researchers to minimize bias because of volunteer participate. The review revealed several carefully developed instruments and analytic approaches for measuring male partner's involvement in PMTCT services and associated factors in PMTCT services in Africa. While these measures were developed for a specific study, structured and pretested self administered and interview questionnaire which accounted for 67% of reviewed studies on male partner's involvement in PMTCT services and various factors affects in PMTCT services in Africa, was the most used strategy. Nine of the reviewed studies explored the determinant of male partner's involvement in PMTCT and associated factors in PMTCT services. In this regard, the majority (47. 7%) of male partner's reported that they were visited ANC/PMTCT clinic with their wives. This instrument can provide a useful stepping stone for the further study of factors which affects male partner's involvement in PMTCT service in Africa. In some studies, the measurement were taken as part of an instrument; however, it is important to use them as measures to identify the factors affecting of male involvement in PMTCT services, and, and to better understand to investigate the method of response to male involvement in

PMTCT services. In contrast, Ditekemena *et al* (2012) found that the male partner's participation is a crucial component in the optimization of PMTCT service. For this reason, ANC/PMTCT is the only opportunity to capture pregnant mothers and their male partner's to prevent the transmission of HIV during pregnancy, labor, and breast feeding (22, 44, 45, 46). This finding has efforts to involve men in ANC services, where PMTCT takes place, have only resulted in a few husbands being involved in PMTCT services have been criticized for bony focusing on females and sidelining males who are the primary support unit to the women (47). The majority of this review studies utilized quantitative and qualitative studies approaches to answer the research questions. Meanwhile, a few studies were using only qualitative method which helps to collect, analyze, and interpret data. They used this method to assess phenomenon, process, prospective and views of Male partner's in PMTCT Services. The majority of reviewed studies frequently used descriptive statistics and multivariate logistic regression to compute study variables and socioeconomic characteristics. This is consistent with a study conducted by male participation in child bearing decisions is crucial and also has a positive impact on the acceptability of PMTCT interventions (47, 48). The age was not statistically significant, factors such as education, and knowledge of PMTCT had an associated with men's willingness to attend PMTCT programmes. Knowledge, income, cultural beliefs were significantly predictor of male's involvement in the prevention of mother to child transmission of HIV and male s had high involvement in PMTCT. Kalembo *et al* (2013) and Aluisoo *et al* (2011) found t that male partner involvement increases the uptake of some PMTCT interventions by HIV positive women. Multi strategic, culturally tailored public health care models are needed to increase the rate of male partner involvement in the program (41), statistically significant associated between male partner involvement and infant HIV transmission rate (44, 45). This finding is consistent with by Irin., 2009; Averting HIV and AIDS or Avert. , 2009) who found that whether men accompanying their partners had any significant influence on attendance levels. The study finding also showed that when women are supported and accompanied by their spouses, it improved their clinic attendance levels (44, 45, 46, 47, 48, 49, 50).

5. Conclusion

The implications of this review are significant in certain areas which worth further research . Further research must look at the impacts of different types of male partner's involvement in PMTCT services. It is proposed that male partner's participation in PMTCT services improves as the male partners gain PMTCT services experiences in their long life with in specific and general characteristics and with experience, male partners gain a sense of saliency in relation to their involvement in PMTCT services and motivate their wives. Male partners may use PMTCT in HIV services independently and eonccerrently to solve weak and long time PMTCT services at health facilities. Finally, future researches

must use rigorous methodology to elicit the real impacts of male partner's involvement in PMTCT services and their factors which affect PMTCT services. Suggestions for future research are also mentioned . perhaps the implications discussed in this review are not only confined to medical students, but also can be utilized by researchers of other disciplines as a guide line to design, plan and conduct similar researches in their own settings. Use of similar health measurements for comparison of outcomes in the future researches is recommended.

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Authors' Contribution

Development of the original idea and protocol data abstraction and analyses, writing the manuscript: Addis Adera Gebru, Mesfine Wudu and Yonas Yimam Ayene: and Development of the protocol, overall Guide data abstraction, preparing the manuscript: Markos Kidane Assefa, Ambachew Woreta Hailu and Tigabu Molla.

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