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Magnitude and associated factors affecting prevention of mother to child transmission of HIV (PMTCT) amongst pregnant mothers in wolkite specialized teaching hospital

By: Amanuel Abebe 036/09

kaleb Worku 147/09

Lidya Keskis 164/09

Natnael Seyoum 181/08

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WOLKITE, ETHIOPIA

Name of Investigators	Amanuel Abebe kaleb Worku Lidya Keskis Natnael Seyoum
Name of Advisor	Dr.Feleke Hable Mr.Abebaw
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Abstract

Background- Mother to child HIV transmission remains a major global health challenge, especially in sub-Saharan Africa. In Ethiopia, over 100,000 pregnant women have HIV yet data on magnitude and associated factors affecting PMTCT are scarce This study aims to determine the magnitude of PMTCT and associated factors in pregnant, lactating and postpartum mothers attending ANC at Wolkite University specialized hospital.

Objective- To assess magnitude and associated factors affecting PMTCT in pregnant mothers who have ANC follow up at Wolkite university specialized hospital 2023 E.C.

Methodology- Data were collected using pretested, structured questionnaire.
The serostatus of those involved in VCT was taken from the card and VCT code. Prior to data collection individual consents were obtained after thorough explanation of the purpose and benefits of the study to the attendants. Data was cleaned, edited and entered into a computer and analyzed using SPSS for windows version 23.0. Statistical tests were employed whenever applicable at the level of significance of 0.05.

Results- A total of 158 ANC attendants were involved in the study and all were enrolled for VCT service. With regards to the magnitude of PMTCT 2 of the 3 HIV positive mothers had good PMTCT practice and were in the age group of 26-39 years and all were married and the difference were not statistically significant and were Muslim in religion and Gurage in ethnicity and the difference were not statistically significant.

The magnitude of PMTCT with occupation of the mother and occupation of the partner showed that it was higher among mothers whose occupation were government employee AOR 1.33 (95% 1.13, 1.56) and occupation of the partner were also government employee 1.23 (1.03, 1.45) respectively and the difference were statistically significant ($p<0.05$).

The magnitude of PMTCT with educational status and educational status of the partner showed that it was higher among College/University educated mothers and also those with College/University educated partners with AOR of 2.41 (95% 2.04, 2.84) and AOR of 1.18 (95% 0.97, 1.39) respectively and the difference were statistically significant ($p<0.05$).

Fear of stigma/discrimination, mode of transportation, cultural or societal beliefs were affecting the practice of PMTCT with AOR of 4.24 (3.67, 4.89), 2.66 (2.25, 3.15), 1.84 (1.51, 2.22) respectively.

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Acronym

PMTCT – Prevention of mother-to-child transmission of HIV

ANC – Antenatal care

ART – Antiretroviral therapy

ARV – Antiretrovirals

MTCT – Mother-to-child transmission of HIV

WHO – World Health Organization

CHW – Community health worker

M2M – Mothers2mothers

mHealth – Mobile health

RED – Reaching Every District

CSA – Central Statistical Agency

EPHI – Ethiopian Public Health Institute

CD4 – Cluster of differentiation 4 (type of white blood cell targeted by HIV

VCT- voluntary counselling and testing

Introduction

1.1. Background

Prevention of mother-to-child transmission (PMTCT) of HIV remains a critical public health priority globally. In 2020, an estimated 150,000 children were newly infected with HIV due to mother-to-child transmission [1].

The majority of these new pediatric HIV infections occurred in sub-Saharan Africa, where health systems face multiple challenges in delivering effective PMTCT services [2]. Key barriers include limited access to and uptake of antenatal care, lack of HIV testing during pregnancy, suboptimal adherence to antiretroviral regimens, and inadequate retention in care and treatment [3].

While significant progress has been made in scaling up PMTCT and reducing vertical transmission risks in many countries, PMTCT coverage and effectiveness remains suboptimal in resource-limited settings [4]. Recent data indicates that vertical transmission risks are five times higher in some African countries compared to the target rates [5]. This highlights the need to better understand the magnitude and associated factors affecting PMTCT in order to inform the strengthening of PMTCT programs and policies.

A range of socioeconomic, cultural, and health systems factors are known to influence PMTCT outcomes. These include maternal HIV disease stage, access to antenatal care, facility delivery, and maternal receipt of antiretroviral therapy, breastfeeding practices, health worker capacity, and male partner involvement [6]. However, there remains a dearth of evidence on the relative contribution of modifiable factors to ongoing vertical transmission in many high-burden African settings. Robust data on the drivers of PMTCT effectiveness has become particularly pertinent given new ambitious global targets to eliminate new pediatric HIV infections altogether [7].

In Ethiopia, over 100,000 pregnancies occurred in HIV-positive women and over 12,000 infants were HIV-positive in 2019 [8]. Assessing magnitude and associated factors affecting PMTCT can help strengthen PMTCT programming and policy to accelerate progress towards elimination of pediatric HIV infections in Ethiopia.

1.2. Statement of the problem

Mother-to-child transmission of HIV remains one of the most persistent challenges facing global HIV prevention and maternal and child health efforts. Despite the availability of effective antiretroviral regimens, 150,000 children worldwide acquired HIV from their mothers in 2020 alone (UNAIDS, 2021). The vast majority of paediatric infections and deaths occur in sub-Saharan Africa, where health systems obstacles continue to undermine prevention of mother-to-child transmission (PMTCT) programming and universal access to HIV treatment for pregnant women. Ethiopia is among the countries with high remaining MTCT burden; A systematic review and meta-analysis. Of 14 studies with 4624 individuals estimated the pooled prevalence of mother-to-child transmission of HIV was 11.4% (95% CI = 9.1–13.7) in Ethiopia.

While Ethiopia has made PMTCT a priority and adopted WHO-recommendations on PMTCT, coverage gaps persist which drive ongoing vertical transmission. Recent data indicates MTCT risks remain up to 5 times higher than global targets in parts of Africa (Adetokunboh & Oluwasanu, 2015). However, there is limited evidence on the epidemiology of MTCT in Ethiopia currently, including the magnitude of mother-to-child HIV transmission, national and sub-national MTCT rates, and the relative contribution of modifiable facility-level and community-level factors driving vertical transmission.

Strong data on the drivers of PMTCT effectiveness in Ethiopia is needed to accelerate progress towards national and global paediatric HIV elimination goals. A study focusing on Wolkite Specialized Hospital is particularly significant because findings from a single institution can highlight localized issues that may not be apparent in national or regional data. Such issues could include institutional policies, healthcare worker training and knowledge, resource availability, patient population characteristics, and other factors specific to this setting.

There is urgent need for implementation research which moves beyond documenting PMTCT coverage to elucidating context-specific barriers undermining PMTCT impact at the health facility and community levels. Such research will generate actionable evidence to optimize PMTCT service delivery models, strengthen health programming, improve resource allocation, and accelerate attainment of MTCT elimination in Ethiopia's highest burden regions.

This proposed study will help address these knowledge gaps by conducting a robust institution based analysis of the magnitude of PMTCT and associated epidemiologic, and health facility factors. The specific aims are to:

1) Determine the PMTCT rate and characterize the PMTCT cascade across health facilities in the study region (Gurage Zone).
2) Identify modifiable maternal health and HIV disease factors associated with PMTCT risk
3) Elucidate the health facility-level determinants, including service quality and health worker capacity, contributing to ongoing PMTCT
4) Synthesize findings to inform optimized PMTCT programming and policies in Ethiopia and analogous high-burden settings.

By generating comprehensive data on the drivers of PMTCT and barriers undermining PMTCT effectiveness, this study will delineate priority interventions to enhance programming and community mobilization around PMTCT. The findings can help inform national strategies and local PMTCT initiatives to accelerate attainment of HIV elimination goals in Ethiopian children.

2. Literature review

Prevention of mother-to-child transmission (PMTCT) of HIV is a global priority, yet implementation remains challenging in resource-limited settings. Without any intervention, transmission rates from an HIV-positive mother to her child can be 15-45% during pregnancy and delivery, and an additional 5-20% through breastfeeding [1].

Globally in 2019, an estimated 150,000 children were newly infected with HIV, mainly through mother-to-child transmission (MTCT) [2]. The vast majority of these paediatric HIV infections occurred in sub-Saharan Africa, which bears a disproportionate burden and accounts for over 90% of pregnant women living with HIV and new paediatric HIV infections worldwide [3].

Major barriers to effective PMTCT globally include poor adherence and high loss to follow-up, especially in the postpartum period [4]. A global meta-analysis found that only 74% of HIV-positive pregnant women achieved optimal ART adherence, and adherence was significantly lower postpartum (53%) compared to during pregnancy (76%) [4]. Loss to follow-up in the PMTCT cascade can occur at multiple steps, including failure to initiate ART, disengagement from care after delivery, and lack of early infant diagnosis and treatment for HIV-exposed infants [5]. Qualitative evidence from multiple African countries demonstrates that stigma and fear of disclosure of HIV status are commonly cited barriers to PMTCT uptake and adherence [6,7].

In Africa, PMTCT uptake remains suboptimal despite scaling up of services. A 2012 systematic review found that in Africa, on average 58% of pregnant women underwent HIV testing, 70% of HIV-positive pregnant women received antiretroviral (ARVs) for PMTCT, and only 43% achieved adequate adherence in the postpartum period [8]. Policy change has lagged behind scientific evidence, with many countries only transitioning from WHO Option A (maternal zidovudine during pregnancy with infant prophylaxis postpartum) to more effective regimens in recent years [9].

Male partner engagement is often lacking despite its importance [10,11]. Involving male partners, through interventions like household HIV testing, increases uptake of interventions like maternal ART [12]. Task-shifting PMTCT components to community health workers (CHWs) is feasible in many settings and shows promise for improving PMTCT coverage and

retention [13]. However, optimized PMTCT requires a fully integrated cascade of services, from antenatal care entry through infant diagnosis and treatment [14].

More recently, WHO has initiated lifelong ART for all pregnant and breastfeeding women regardless of CD4 count or clinical staging – has been rolled out across sub-Saharan Africa to simplify treatment protocols and hopefully enhance retention in care [15]. This transition could eliminate the need for baseline CD4 testing, speed up ART initiation, reduce stigma compared to programs requiring disclosure of HIV status, and provide health benefits to mothers through earlier ART [16]. However, this faces challenges in implementation. Potential risks include increased opt-out from PMTCT, non-adherence to ART during pregnancy and postpartum, development of ART resistance, and failure to retain mother-infant pairs in care long-term [17].

A study in Malawi found significantly higher rates of loss to follow-up among women starting ART while pregnant or lactating compared to those starting ART for their own health, with 17% lost within 6 months and half having gaps in ART adherence [18]. In Tanzania, women expressed hesitancy about initiating lifelong treatment during pregnancy if feeling healthy, fearing side effects and anticipating loss of motivation postpartum [19]. Paradoxically, while ART during pregnancy and breastfeeding is expected to reduce vertical transmission, studies in Botswana and South Africa have found increased opt-out and vertical transmission compared to previous protocols [20,21]. This underscores the need for interventions to improve uptake, adherence, and retention.

In Ethiopia, PMTCT coverage has increased but gaps remain. While Ethiopia adopted WHO PMTCT recommendations relatively quickly, shifting from single-dose nevirapine to Option A in 2010 and Option B+ in 2013 [22], The 2016 Demographic and Health Survey found that just 32% of pregnant women received HIV counselling during ANC and 46% were tested for HIV [23]. In 2019, over 100,000 pregnancies occurred in HIV-positive women and there were over 12,000 HIV-positive births [24]. The Mohammed Al Amoudi Foundation surveyed 300 HIV-positive pregnant Ethiopian women and found very low PMTCT knowledge, with just 4% knowing that vertical transmission risk was 15-45% without intervention [25]. Qualitative research in Ethiopia likewise demonstrates that stigma and non-disclosure of HIV status are common barriers to PMTCT adherence [26]. However, community-based support

from CHWs and civil society organizations has been important for improving PMTCT outcomes in Ethiopia.

Several initiatives have used community health workers (CHWs) to facilitate PMTCT uptake and retention. JHPIEGO's Reaching Every District (RED) approach employed CHWs to trace women lost to follow-up, conduct outreach services, and actively engage male partners, leading to significant improvements in indicators like repeat HIV testing in pregnancy and ARV provision [27]. Other programs like mothers2mothers (M2M) recruit mentor mothers – HIV-positive women who recently went through PMTCT themselves – to provide education and psychosocial support to pregnant women and new mothers [28]. An evaluation in Zimbabwe found M2M doubled the rate of early infant diagnosis compared to standard of care [29].

Male engagement facilitates PMTCT success in Ethiopia as in other African countries. Male partners are often the primary decision-makers regarding healthcare, so lack of male involvement threatens PMTCT uptake [30]. An intervention providing household HIV testing for male partners significantly increased couple's testing compared to men receiving written clinic invitations [31]. Men who knew their wives had enrolled in PMTCT programs played an active role in infant feeding and weaning in one study [32]. However, qualitative research also reveals barriers to male participation, including cultural norms around pregnancy as a woman's domain and PMTCT clinics being unwelcoming to men [33].

Some innovative strategies for strengthening PMTCT show promise in Ethiopia. Mobile health (mHealth) tools can empower CHWs to track pregnant women through the cascade and send reminders about appointments [34]. Engaging faith communities to hold baby showers with HIV education and testing increased uptake of maternal HIV testing [35]. Ongoing areas for improvement include family planning provision, repeat HIV testing in late pregnancy, early infant diagnosis and prompt ART initiation, and retention of HIV-positive mothers and babies in quality care [36].

In conclusion, prevention of vertical HIV transmission is a public health priority both globally and in countries like Ethiopia with high HIV prevalence. Sub-Saharan Africa bears the greatest burden, with structural barriers like stigma and gender inequality threatening elimination efforts. Male engagement and community-based support are essential to facilitate pregnant women's uptake of and retention in PMTCT. Ethiopia has adopted progressive

policies, but gaps in PMTCT knowledge and adherence persist. Moving forward, Ethiopia and other countries hoping to eliminate paediatric HIV will need to strengthen PMTCT programs through integrated services, evidence-based implementation strategies like mHealth and male involvement, and a focus on quality and retention at each step of the PMTCT cascade.

3. Significance of the study

By conducting an institution based study about the magnitude of PMTCT and its associated factors across the PMTCT cascade, this study will identify high-yield areas for improving PMTCT outcomes in the study population. Study findings can help inform national policies and strategic plans aimed at eliminating new paediatric HIV infections. The results will also be relevant for health programming in other countries with a high HIV burden and PMTCT service challenges.

This research would have several benefits for various stakeholders:

1. **Healthcare Providers:** This research will identify gaps in knowledge and skills among healthcare providers at Wolkite Specialized Hospital, leading to targeted training and education to improve PMTCT services.
2. **Pregnant Women Living with HIV and Their Families:** Improved PMTCT services resulting from this research will lead to reduced risk of mother-to-child transmission of HIV, improving health outcomes for both mothers and children.
3. **Researchers:** The study could contribute to the global body of knowledge on PMTCT, providing a foundation for future research on this topic.
4. **General Public:** This research will potentially increase awareness about the importance of PMTCT and the challenges associated with it, leading to increased public support for PMTCT programs.

4. Objective of study

4.1. General objectives

To assess magnitude and associated factors affecting PMTCT in wolkite specialized teaching hospital from August 14-28 2023 G.C..

4.2. Specific objective

To determine magnitude of PMTCT in wolkite specialized teaching hospital from August 14-28 2023 G.C.

To identify factors associated with PMTCT in wolkite specialized teaching hospital from August 14-28 2023 G.C.

4. Materials and Methods

4.1. Study Area

This study was conducted in Wolkite university specialized hospital which is found in Gubre sub-city, Wolkite. Wolkite is a town and separate woreda in south-central Ethiopia. Located in the Gurage Zone of the Southern Nations, Nationalities and Peoples' Region

Based on the 2007 Census conducted by the CSA, this town has a total population of 28,866, of whom 15,074 are men and 13,792 women.

A 2021 study showed that the projected total population of the town for the 2020 fiscal year was 102,948 (Male = 55,858, Female = 52,090), based on the 2007 CSA forecast with the total number of women in the reproductive age group (15–49 years) being 23,246, representing 22.6% of the population as a whole.

There were a total of 1130 patient who attended ANC services in wolkite specialized hospital with in the year August 28 2023 G.C.

4.2. Study period: The study was conducted from August 14 to August 28 2023 G.C.

4.3. Study design:

An institutional based cross-sectional study was conducted in Wolkite university specialized hospital from August 14 to August 28 2023 G.C.

4.4. Populations:

4.4.1 Study population: All pregnant women who are receiving antenatal care (ANC) services at Wolkite university specialized hospital.

4.4.2 Inclusion criteria: All pregnant women who are receiving antenatal care (ANC) services at Wolkite university specialized hospital including postpartum and lactating mothers.

- Participants who are willing and able to provide informed consent for participation in the study.

4.4.4. Exclusion criteria:

- Participants who are post- partum and lactating mothers.

4.6. Sample size: The sample size for this study is calculated using formula for a single population proportion considering the following assumptions.

- 95% confidence level, margin of error (0.05) and (P=0.5) according to a study conducted in Ethiopia titled "Magnitude and Predictors of Anti-Retroviral Treatment (ART) Failure in Private Health Facilities in Addis Ababa, Ethiopia" by Desalegn et al., in 2015, the prevalence of mother-to-child transmission of HIV was estimated to be about 22%.

$$n=\frac{(Z\alpha 1/2)^2\ P\ (q)}{(SE)^2}$$

$$n = \frac{(1.96)^2\ 0.22\ (1-0.22)}{(0.05)^2}$$

$$n= 248.467584$$

Since we can't have a fraction of a participant, we round this up to the nearest whole number which gives us a sample size of 249.

Since our sample is going to be taken from the total 343 pregnant mothers attending ANC i.e. N<10,000 our minimum sample size required will be:

$$n= \frac{n}{1+\frac{n}{N}} = \frac{249}{1+\frac{249}{343}} = 144.2$$

Again since we can't have a fraction of a participant, we round this up to the nearest whole number which gives us a sample size of 144.

However, it is good practice to add an additional 10% to account for non-response or loss to follow-up. If we add 10% to this, we will get an additional 14 (rounded to the nearest whole number) participants, making the total sample size 158.

4.7. Sampling methods

Simple random Sampling: Participants were randomly selected from the patients attending at ANC totalling 343 including first time ANC attendants ensuring that every individual in the population has an equal chance of being chosen. (ANC registry of Wolkite university specialized hospital)

4.8. Variables

4.8.1. Independent Variables:

- **Education Level**
- **Marital status**
- **Religion**
- **Ethnicity**
- **Occupation**
- **Occupation of her partner**
- **level of education the partner**
- **Gravidity**
- **Parity**
- **History of HIV/AIDS the family**
- **Knowledge about PMTCT**
- **Attitude towards PMTCT services**
- **Barriers to PMTCT services**
- **Associated factors affecting PMTCT**
- **Male Partner Involvement**
- **Stigma**
- **Adherence to PMTCT Protocols:**

4.8.2. Dependent Variables:

Magnitude of PMTCT: This refers to the extent, scale or importance of strategies and measures implemented to prevent the transmission of HIV from a HIV-positive mother to her child during pregnancy, labor, or delivery in wolkite specialized teaching hospital. i.e. the practice of PMTCT

4.9. Operational definition

- **Magnitude**: This is operationally defined as the extent, scale or importance of strategies and measures implemented to prevent the transmission of HIV from a HIV-positive mother to her child during pregnancy, labor, or delivery.in wolkite specialized teaching hospital. i.e. the practice of PMTCT which was defined as a score of 2 on the questionnaire assessing the practice of PMTCT protocols such as the presence of complete adherence to PMTCT protocols (), and giving birth at a health facility

4.10. Data collection techniques and procedures

4.10.1. Data collection techniques:

- **Questionnaires:** These were used to gather information from patients about their experiences with PMTCT services.
- **Medical Records Review:** Data on PMTCT cases were extracted from the hospital's medical records. This allowed access to a large amount of data

4.10.2 Data Collection Procedures:

- **Develop a Data Collection Plan:** We identified data to be collected with regards to the independent and dependent variables and how it will be collected in the questionnaire, and who will collect it was also identified.
- **Train Data Collectors**: We trained all our members to ensure consistency in data collection.
- **Data Collection:** We executed our data collection plan with ethical considerations, such as obtaining informed consent from participants and maintaining their privacy and confidentiality.
- **Data Management:** Our collected data was managed effectively involving data entry, data cleaning to remove errors, and data storage.

4.11. Data analysis

Quantitative data were analyzed using appropriate statistical software SPSS for windows version 23.0., with descriptive statistics used to summarize the data.

Bivariate and multivariate analyses were employed to identify the associated factors affecting PMTCT.

4.12. Data quality control methods

4.12.1. Training Data Collectors: We ensured the consistency and accuracy of data collection by training all data collectors thoroughly in the data collection methods and tools used in the research and they fully understood the purpose of the research, the variables being measured, and how to correctly use the data collection instruments.

4.12.2. Regular Auditing: we performed random checks or audits of the data collected to help detect any errors or inconsistencies and this were done regularly throughout the data collection process.

4.12.3. Double Data Entry: we used two different individuals independently to enter the data into the system and any discrepancies between the two entries were resolved, reducing the chance of data entry errors.

4.12.4. Data Cleaning: After data collection, we reviewed and "cleaned" the data to identify and correct any errors, inconsistencies, or outliers. This was done using statistical software SPSS for windows version 23.0.

Missing values were identified and corrected

4.12.5. Use of Standardized Instruments: we used standardized questionnaires, for data extraction.

4.12.6. Pilot Testing: Before starting the main data collection, we conducted a pilot test to identify any potential issues with the data collection instruments or procedures. Which allowed necessary adjustments to be made before the full-scale data collection began.

4.12.7. Data Verification: The data we collected through questionnaires was verified with the participants which helped to ensure the accuracy of the data and allowed participants to clarify any responses if necessary.

4.13. Ethical consideration

All ethical norms and guidelines for medical research as stipulated by the Declaration of Helsinki was adhered to and we obtained informed consent from participants and maintained their privacy and confidentiality and all data was anonymized to maintain confidentiality.

Ethical clearance was sought from the community based education coordinator and we were provided with a paper granting the research could be conducted in the hospital and we also requested and were granted permission to conduct the research by the wolkite university specialized hospital medical director.

Results

Socio-demographic characteristics

A total of 158 ANC attendants were involved in the study and all were enrolled for VCT service. The mean age of the participants was age 26 with a standard deviation of 5 (26± 5) and were married 145 (91.8%) (95CI 0.863,0.955) Orthodox account for the major religion 75 (47.5%) (95 CI 0.395,0.556). Regarding educational status and occupation, most of them have no formal education 100 (63.3%) (95 CI 0.553,0.708) and were housewives 140 (88.6%) (95 CI 0.826,0.931) Occupation of most of the partners were farmer 79 (50%) (95 CI 0.42,0.58) (Table 1).

Reproductive History

Most of the participants were multigravida 122 (77.2%) (95 CI 0.732,0.834) but considering parity most were para I 54 (34.2%) (95 CI 0.262,0.421). Most of the participants 113 (71%) (95 CI 0.702,0.814) have previous 4 or more ANC contacts in their previous pregnancy and all of them gave birth at a health facility.

PMTCT

With regards to magnitude of PMTCT 2 of the 3 HIV positive mothers have good PMTCT practice and were in the age group of 26-39 years and all were married and the difference were not statistically significant and were Muslim in religion and Gurage in ethnicity and the difference were not statistically significant.

The magnitude of PMTCT with occupation of the mother and occupation of the partner showed that it was higher among mothers whose occupation were government employee AOR 1.33 (95% 1.13, 1.56) and occupation of the partner were also government employee 1.23 (1.03, 1.45) respectively and the difference were statistically significant ($p<0.05$). (Table 2).

The magnitude of PMTCT with educational status and educational status of the partner showed that it was higher among College/University educated mothers and also those with College/University educated partners with AOR of 2.41 (95% 2.04, 2.84) and AOR of 1.18 (95% 0.97, 1.39) respectively and the difference were statistically significant ($p<0.05$). (Table 2).

Knowledge about HIV/AIDS

Concerning knowledge about HIV/AIDS and PMTCT; all of them heard about HIV/AIDS and 142 (89.9 %) (95% CI 0.841,0.941) heard about PMTCT with the majority 92 (58.2%) (95% CI 0.501,0.660) hearing about PMTCT from hospitals or clinic followed by Media (Tv or Radio) 44 (27.8%) (95% CI 0.210,0.355) and 142 (89.9%) (95% CI 0.841,0.941) knew how HIV can be transmitted from mother to child and 136 (86.1%) (95% CI 0.797,0.911) of the participants knew methods to prevent mother to child transmission of HIV and 131 (82.9%) (95% CI 0.761,0.844) knew the risk of HIV transmission is increased if breast feeding continues for more than 2 years and also 138 (87.3%) (95% CI 0.811,0.921) are aware of the PMTCT services provided at wolkite specialized hospital and 110 (69.6%) (95% CI 0.616,0.767) of the women knew that ARV prophylaxis can reduce the risk of MTCT of HIV (Table 3).

Attitude towards PMTCT

With regards to attitude towards PMTCT all of them utilized the PMTCT services at wolkite specialized hospital with 114 (72.2%) (95% CI 0.645,0.79) strongly agreeing that PMTCT can reduce mother to child transmission of HIV. (Table 4).

Factors affecting PMTCT

All of the HIV positive participants have experienced barriers to utilizing PMTCT services at wolkite specialized hospital of which 2 (50%) (95% CI 0.068,0.932) faced financial barriers while the rest faced distance and sociocultural barriers and all of the participants believe that their socioeconomic status is affecting their utilization of PMTCT services and 126 (79.7%) (95% CI 0.726,0.857) believe that societal and cultural beliefs are impacting their utilization of their PMTCT services. (Table 5).

All of the participants believe that there is stigma against women living with HIV with all of the HIV positive women not disclosing their HIV status due to fear of stigma and all of the HIV positive women state that stigma has often affected their adherence to PMTCT protocols.

Most of the 126 (79.7%) (95% CI 0.726,0.857) participants use public transportation services and 48 (30.4%) (95% CI 0.233,0.382) have experienced difficulty accessing healthcare when needed due to lack of transportation while 43 (27.2%) (95% CI 0.204,0.349) have experienced difficulty accessing healthcare when needed due to cost of services.

All of the participant's state that their socio-economic status influences their access to PMTCT services and 126 (79.7%) (95% CI 0.726,0.857) state that cultural or societal beliefs impacted their access to PMTCT services.

The majority of the participants 63 (39.9%) (95% CI 0.322,0.48) state that improving transportation/access will increase their access to PMTCT services while 62 (39.2%) (95% CI 0.316,0.473) of the participant's state that Increasing community awareness to avoid stigma will increase utilization of PMTCT services.

Fear of stigma/discrimination, mode of transportation, cultural or societal beliefs were affecting the practice of PMTCT with AOR of 4.24 (3.67, 4.89), 2.66 (2.25, 3.15), 1.84 (1.51, 2.22) respectively. (Table 6).

Male partner involvement

With regards to male partner involvement 141 (89.2%) (95% CI 0.833,0.936) of the participants have disclosed their HIV status to their male partner and 86 (54.4%) (95% CI 0.463,0.624) of the participant's male partners attended some visits and 43 (27.2%) (95% CI 0.204,0.349) attended most or all visits.

Of the 29 (18.4%) (95% CI 0.127,0.253) participants whose male partners were not involved, the main reason was lack of willingness to be involved by their male partners 13 (44.8%)

(95% CI 0.264,0.643) followed by the participants lack of willingness for their male partner to be involved 12 (41.4%) (95% CI 0.235,0.611) (Table 7).

Practices to prevent HIV and its PMTCT

With regards to practices to prevent HIV and its PMTCT 122 (77.2%) (95% CI 0.699,0.835) received PMTCT services during their last pregnancy of which 112 (77.2%) (95% CI 0.694,0.838) were tested for HIV while 3 of the participants who were HIV positive received all PMTCT services and 90 (57%) (95% CI 0.531, 0.675) of the participant's partners were not HIV tested before sexual inter course and 151 (95.6%) (95% CI 0.911,0.982) of the participant's partners were not HIV tested before marriage and 3 (1.9%) (95% CI 0.004,0.054) have history of unsafe abortion and 70 (44.3%) (95% CI 0.364,0.524) have experienced unsafe sex before marriage and 12 (7.6%) (95% CI 0.04,0.129) have history of genital swelling, discharge, or ulcer during your pregnancy of which 9 (75%) (95% CI 0.428,0.945) were treated and 89 (59.3%) (95% CI 0.482,0.642) of the participants had ≥2 ANC follow up before this.

Table 1 Socio-demographic characteristics

Socio-demographic characteristics		Frequency	Percent
Age	17 - 20	29	18.4
	21 - 25	49	31.0
	26 - 29	42	26.6
	30 - 34	26	16.5
	35-39	12	7.6
Marital status	Single	7	4.4
	Married	145	91.8
	Other*	6	3.8
Level of education	No formal education	100	63.3
	Primary school	31	19.6
	Other+	27	17.1
Level of education of her partner	No formal education	110	69.6
	Primary school	31	19.6
	Other#	17	10.7
Occupation	House wife	140	88.6
	Student	8	5.1
	Other	10	6.3
Occupation of her partner	government employee	47	13.9
	Farmer	79	29.7
	Other	111	50.0
Religion	Orthodox	75	47.5
	Muslim	67	42.4
	Protestant	16	10.1
Ethnicity	Gurage	131	82.9
	Other	27	22.5

Table 2 Socio-demographic characteristics regression table

		PMTCT Practice				
		Good PMTCT Practice	Poor PMTCT Practice	COR (95%CI)	AOR (95% CI)	P value
level of education of the partner	No formal education	50	25	1		
	College/University	15	30	1.12 (0.99, 1.31)	1.18 (0.97, 1.39)	0.002
Occupation of her partner	Government employee	30	15	1.16 (1.04, 1.31)	1.23 (1.03, 1.45)	0.001
	Farmer	25	10	1		
Occupation	House wife	25	10	1		
	government employee	30	15	1.21 (1.09, 1.37)	1.33 i(1.13, 1.56)	0.021
level of education	No formal education	50	25	1		
	College/Univ	10	20	1.91 (1.66,	2.41 (2.04,	0.001

	ersity			2.19)	2.84)	

Table 3 Knowledge about HIV/AIDS and PMTCT

knowledge about HIV/AIDS and PMTCT		Frequency	Percent
Previous awareness about PMTCT	Yes	142	89.9
	No	16	10.1
Source of information about PMTCT	Hospital /Clinic	92	58.2
	Media (TV, Radio)	44	27.8
	Internet	14	8.9
	Friends/ Family	8	5.1
	No	20	12.7
Knowledge about ARV prophylaxis reducing the risk of MTCT of HIV	Yes	110	69.6
	No	48	30.4
Knowledge about risk of transmission from an HIV positive mother to her child without any intervention	Less than 15%	9	5.7
	15%-45%	8	5.1
	Over 45%	10	6.3
	Unsure	131	82.9
Knowledge about risk of HIV infection through breast milk if the infant fed for more than 2 years	True	131	82.9
	False	27	17.1

Table 4 Attitude towards PMTCT

Attitude towards PMTCT		Frequency	Valid Percent
Frequency of visit to the hospital for PMTCT services	Regularly	7	4.4
	Occasionally	3	1.9
	Never	148	93.7
Belief about the efficacy of PMTCT methods	Strongly agree	114	72.2
	Agree	44	27.8

Table 5 Factors affecting PMTCT

Factors affecting PMTCT Practice		Frequency	Percent
Adherence to PMTCT protocols affected by stigma/discrimination	Yes, often	1	10.0
	Yes, sometimes	6	60.0
	No, it has not affected my adherence	3	30.0
Factors which prevented access to healthcare in the past year,	Distance to facility	11	7.0
	Lack of transportation	48	30.4
	Cost of services	43	27.2
	Long wait times	18	11.4
	None	19	12.0
	All	19	12.0
Mode of transportation used to reach the health facility	Walking	32	20.3
	Public transportation	126	79.7
Barriers type faced	Financial barriers	2	50.0
	Distance/geographical barriers	1	25.0
	Sociocultural barriers	1	25.0
Measures to be taken to improve access to PMTCT services	Increase community awareness	62	39.2
	Improve health service delivery	24	15.2
	Increase community awareness	62	39.2
	Improve transportation/access	63	39.9
	Other	6	3.8
	A,B &C	3	1.9

Effect of cultural or societal beliefs on access to PMTCT services	Yes	126	79.7
	No	32	20.3

Table 6 Factors affecting PMTCT regression table

		PMTCT practice				
Factors affecting PMTCT Practice		Good PMTCT practice	Poor PMTCT practice	COR 95% CI	AOR 95% CI	P value
Fear or stigma affecting utilization of PMTCT services	Yes	60	40	3.11 (2.79, 3.47)	4.24 (3.67, 4.89)	0.000
	No	29	29	1		
Mode of transportation	Public transportation	30	27	2.07 (1.81, 2.37)	2.66 (2.25, 3.15)	0.001
	Walking	50	25	1		
	Private vehicle	20	30	1.5 (1.2, 1.84)	1.71(1.34,1.97)	0.051
	Other:	10	16	0.62 (0.44, 0.85)	0.81(0.53,0.97)	0.024
Barriers while accessing PMTCT services at Wolkite Specialized Hospital	Yes	20	68	2.54 (2.27, 2.84)	3.31 (2.87, 3.83)	0.012
	No	50	25	1		
Effect of cultural or societal	Yes	30	10	1.55 (1.32, 1.82).	1.84 (1.51, 2.22)	0.000

beliefs on access to PMTCT services	No	105	53	1		

Table 7 Male partner involvement

Characteristics		Frequency	Percent
Disclosure of HIV status to male partner	yes	141	89.2
	no	17	10.8
Male partner involvement in antenatal care visits and HIV testing	Yes, he attended most or all visits	43	27.2
	Yes, he attended some visits	86	54.4
	No, he did not attend any visits	29	18.4
Reason for lack of male partner involvement	I did not want him involved	12	41.4
	He was unwilling to be involved	13	44.8
	He was unable to attend due to work or other commitments	4	13.8

DISCUSSION

The study showed that with regards to the magnitude of PMTCT 2 of the 3 HIV positive mothers had good PMTCT practice and were in the age group of 26-39 years and all were married and the difference were not statistically significant and were Muslim in religion and Gurage in ethnicity and the difference were not statistically significant.

The magnitude of PMTCT with occupation of the mother and occupation of the partner showed that it was higher among mothers whose occupation were government employee AOR 1.33 (95% 1.13, 1.56) and occupation of the partner were also government employee 1.23 (1.03, 1.45) respectively and the difference were statistically significant ($p<0.05$).

The magnitude of PMTCT with educational status and educational status of the partner showed that it was higher among College/University educated mothers and also those with College/University educated partners with AOR of 2.41 (95% 2.04, 2.84) and AOR of 1.18 (95% 0.97, 1.39) respectively and the difference were statistically significant ($p<0.05$)..

Concerning knowledge, all heard about HIV/AIDS which were comparable with studies done at Tikur anbessa and Zewditu memorial hospital (33). In this study 69.6% (95% CI 0.616,0.767) of mothers knew that ARV prophylaxis can reduce risk of MTCT of HIV which is comparable when compared to research done in Tikuranbessa and Zewditu memorial hospital that was 64.4%(33).

With regards to attitude towards PMTCT all of them utilized the PMTCT services at wolkite specialized hospital with 114 (72.2%) (95% CI 0.645,0.79) strongly agreeing that PMTCT can reduce mother to child transmission of HIV. This result showed that the attitude of

mothers towards PMTCT of HIV needs improvement and interventions should be done accordingly.

As to the practice, 44.3% (95% CI 0.364,0.524) of mothers had history of unsafe sex, 7.6% (95% CI 0.04,0.129) had STD during pregnancy and 1.9% (95% CI 0.004,0.054) had unsafe abortion. Only 4.4% had HIV test before marriage or sexual intercourse and 57.0% of their partners had HIV test before marriage. Showing poor attitude towards involvement VCT,

With regards to factors affecting PMTCT 4 (2.5%) participants have experienced barriers to utilizing PMTCT services at wolkite specialized hospital and all of them were HIV positive of which 2 (50%) faced financial barriers while the rest faced distance and sociocultural barriers and all of the participants believe that their socioeconomic status is affecting their utilization of PMTCT services and 126 (79.7%) believe that societal and cultural beliefs are impacting their utilization of their PMTCT services.

All of the participants believe that there is stigma against women living with HIV with 7 (70%) of the HIV positive women not disclosing their HIV status due to fear of stigma and 6 (60%) of the HIV positive women state that stigma has often affected their adherence to PMTCT protocols.

Most of the 126 (79.7%) participants use public transportation services and 48 (30.4%) have experienced difficulty accessing healthcare when needed due to lack of transportation while 43 (27.2%) have experienced difficulty accessing healthcare when needed due to cost of services.

All of the participant's state that their socio-economic status influences their access to PMTCT services and 126 (79.7%) state that cultural or societal beliefs impacted their access to PMTCT services.

The majority of the participants 63 (39.9%) state that improving transportation/access will increase their access to PMTCT services while 62 (39.2%) of the participant's state that Increasing community awareness to avoid stigma will increase utilization of PMTCT services.

Fear of stigma/discrimination, mode of transportation, cultural or societal beliefs were affecting the practice of PMTCT with AOR of 2.75 (95% CI 1.78,4.24), 3.12 (95% CI 2.03,4.81), and 2.68 (95% CI 1.74,4.14) respectively.

Conclusion

The study showed that with regards to the magnitude of PMTCT 2 of the 3 HIV positive mothers had good PMTCT practice and were in the age group of 26-39 years and all were married and the difference were not statistically significant and were Muslim in religion and Gurage in ethnicity and the difference were not statistically significant.

The magnitude of PMTCT with occupation of the mother and occupation of the partner showed that it was higher among mothers whose occupation were government employee AOR 1.33 (95% 1.13, 1.56) and occupation of the partner were also government employee 1.23 (1.03, 1.45) respectively and the difference were statistically significant ($p<0.05$). (Table 2).

The magnitude of PMTCT with educational status and educational status of the partner showed that it was higher among College/University educated mothers and also those with College/University educated partners with AOR of 2.41 (95% 2.04, 2.84) and AOR of 1.18 (95% 0.97, 1.39) respectively and the difference were statistically significant ($p<0.05$). (Table 2).

Fear of stigma/discrimination, mode of transportation, cultural or societal beliefs were affecting the practice of PMTCT with AOR of 4.24 (3.67, 4.89), 2.66 (2.25, 3.15), 1.84 (1.51, 2.22) respectively.

Recommendations

According to this study we would like to recommend:

1. VCT service should be available all the time the mothers come for ANC and family planning service.
2. VCT service should include the partner because almost all mothers believe partner involvement in VCT.
3. Health Education should be provided to avoid unsafe sex before marriage and without HIV testing
4. Health education should be provided to the community to decrease stigma and discrimination against people living with HIV

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DATA COLLECTION QUESTIONNAIRE

Dear respondent this questionnaire is designed to gather information about the magnitude and associated factors affecting PMTCT in Wolkite Specialized Hospital. Your responses will be used for research purposes only. Your participation is voluntary and your responses will be kept confidential.

PART I: DEMOGRAPHIC INFORMATION

1. What is your age?

2. What is your marital status?

   a) Single b) Married c) Divorced d) Widowed

3. What is your highest level of education?

   a) No formal education b) Primary school c) Secondary school
   d) College/University e) Post-graduate

4. Religion

   a) orthodox
   b) Muslim

c) Protestant
d) Other (specify) _____

5. Ethnicity

a) Oromo
b) Amhara
c) Gurage
d) Tigrie
e) other (specify) _____

6. What is your current occupation?

a) House wife
b) Student
c) government employee
d) merchant
e) House maid

7. Occupation of her partner
a) Merchant
b) government employee
c) Farmer
d) daily laborer
e) student F. other (specify) _____

8. What is your highest level of education your partner?

a) No formal education
b) Primary school
c) Secondary school
d) College/University
e) Post-graduate f. Other (specify) _____

9. Gravidity

a) Primigravida
b) Multigravida

10. How many children do you have?

a) None b) 1 c) 2 d) 3 or more

11. Do you have any history of HIV/AIDS in your family?

    a) Yes b) No

PART II: KNOWLEDGE ABOUT PMTCT

1. What is the risk of transmission from an HIV positive mother to her child without any intervention?
    a) Less than 15%
    b) 15% - 45%
    c) Over 45%
    d) Unsure

2. Which of the following can reduce the risk of an HIV positive mother transmitting the virus to her child? (Check all that apply)
    a) Antiretroviral (ARV) medicines
    b) Delivery at a health facility
    c) Exclusive breastfeeding for 6 months
    d) Mixed feeding before 6 months
    e) Unsure

3. Have you ever heard about PMTCT (Prevention of Mother to Child Transmission)?

    a) Yes b) No

4. Where did you hear about PMTCT?

    a) Hospital/Clinic b) Media (TV, Radio)

    c) Internet d) Friends/Family e) Other

5. Do you know how HIV/AIDS is transmitted from mother to child?
    a) Yes b) No

6. Are you aware of the PMTCT services provided at Wolkite Specialized Hospital?

    a) Yes b) No

7. Do you know ARV prophylaxis during pregnancy could reduce the risk of MTCT of HIV?
    a) yes
    b) No
    c) Don't know

8. The risk of HIV infection through breast milk is higher if the infant fed for longer period like 2 years
    a) True
    b) False

PART III: ATTITUDE TOWARDS PMTCT SERVICES

1. Have you or your partner ever utilized PMTCT services at Wolkite Specialized Hospital?

    a) Yes b) No

2. How often do you visit the hospital for PMTCT services?

    a) Regularly b) Occasionally c) Never

3. Do you believe PMTCT methods are effective?

    a) Strongly agree b) Agree

    c) Neutral d) Disagree e) Strongly disagree

PART IV: ASSOCIATED FACTORS AFFECTING PMTCT

1. Do you think your socio-economic status influences your access to PMTCT services?
    a) Yes b) No

2. Do you believe that cultural or societal beliefs impact your access to PMTCT services?

    a) Yes b) No

    If yes, what societal or cultural beliefs affect your PMTCT access and in what way

3. Do you think your knowledge and attitude towards PMTCT affect your utilization of PMTCT services?

    a) Yes b) No

If yes, further clarify…

4. Do you believe that the healthcare system (availability of services, quality of care, etc.) affects your access to PMTCT services?

   a) Yes b) No

5. Have you ever faced any barriers while accessing PMTCT services at Wolkite Specialized Hospital?

   a) Yes b) No

6. If yes, what kind of barriers have you faced?

   a) Financial barriers b) Distance/geographical barriers
   c) Sociocultural barriers d) Health system related barriers
   e) Other

7. What mode of transportation do you typically use to reach the health facility?
   a) Walking
   b) Public transportation
   c) Private vehicle
   d) Other:_____

8. In the past year, did any of the following prevent you from accessing healthcare when needed? (Check all that apply)
   a) Distance to facility
   b) Lack of transportation
   c) Cost of services
   d) Long wait times
   e) None
   f) Other: _____

9. What can be done to improve access to PMTCT services?

   a) Improve health service delivery

   b) Increase community awareness

   c) Improve transportation/access d) Other

10. Do you feel there is stigma against pregnant women living with HIV in your community?

a) Yes
b) No

11. Has fear of stigma/discrimination prevented you from disclosing your HIV status?
    a) Yes
    b) No

12. Has fear of stigma/discrimination affected your adherence to PMTCT protocols?
    a) Yes, often
    b) Yes, sometimes
    c) No, it has not affected my adherence

PART V Male Partner Involvement

1. Have you disclosed your HIV status to your male partner?
    a) Yes
    b) No

2. Was your male partner involved in your antenatal care visits and HIV testing?
    a) Yes, he attended most or all visits
    b) Yes, he attended some visits
    c) No, he did not attend any visits

3. If your male partner was not involved, what was the main reason?
    a) I did not want him involved
    b) He was unwilling to be involved
    c) He was unable to attend due to work or other commitments
    d) The health facility did not encourage his involvement
    e) Not applicable

Part VI: Adherence to PMTCT Protocols

1. Have you adhered 100% to the PMTCT protocols prescribed by your healthcare provider, including taking ARV medication as directed?
    a) Yes, I have adhered 100%
    b) No, I have missed some doses or appointments

2. If you have not adhered 100%, what were the main reasons? (Check all that apply)
    a) Too busy
    b) Forgot doses
    c) Ran out of medication
    d) Side effects
    e) Felt healthy so didn't think medication was needed
    f) Other:_____

3. Did you give birth at a health facility?
    a) Yes
    b) No

Part VII: Practices to prevent HIV and its PMTCT

1. How many visit did you have during your ANC follow up before this
    a) None
    b) One
    c) > 2

2. Do you have any history of genital swelling discharge, ulcer during your pregnancy?
    a) Yes
    b) No

3. If yes to Q 2 did you get treated?
    a) Yes
    b) No

4. Have you ever experienced unsafe sex before marriage?
    a) yes
    b) No

5. Do you have any practice of tooth extraction or injections out of health institutions?
    a) yes
    b) No

6. Do you use sharp materials, which were used by others?

a) Yes
b) No

7. Do you have any history of blood transfusions?
   a) yes
   b) No

8. Do you have history of unsafe abortion?
   a) yes
   b) No

9. Do you have history of illicit injections?
   a) yes
   b) No

10. Did you have HIV test before marriage sexual intercourse with your partner?
    a) yes
    b) No

11. Did your partner /husband have HIV test before you had sexual inter course with him?
    a) yes
    b) No

12. Were you counseled and tested for HIV during your pregnancy?
    a) yes
    b) No

13. Did you receive PMTCT services during your last pregnancy?

    a) Yes
    b) No

14. If yes, what PMTCT services did you receive?
    a) HIV testing
    b) Antiretroviral therapy (ART)
    c) Prevention of mother-to-child transmission (PMTCT) counselling
    d) other

15. Did you have any complications during your last pregnancy?
    a) Yes
    b) No

16. If yes, what complications did you have?
    a) Preterm labor
    b) Low birth weight
    c) Stillbirth
    d) Infant death

17. HIV test result (to be filled from the VCT code)
    a) positive
    b) Negative