FACTORS ASSOCIATED WITH MISSING APPOINTMENTS IN THE PREVENTION OF MOTHER TO CHILD TRANSMISSION OF HIV (OPTION B+) PROGRAM IN NJOMBE TOWN COUNCIL

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By

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A dissertation Submitted in (Partial) Fulfillment of the Requirements for the Degree of Master of Medicine (Obstetrics and Gynecology) of

Muhimbili University of Health and Allied Sciences
October, 2017

CERTIFICATION

The undersigned certify that he has read and hereby recommend for acceptanceby Muhimbili University of Health and Allied Sciences a dissertation entitled: ***"Factors associated with missing appointments in the prevention of mother to child transmission of HIV (Option B+) program in Njombe Town Council"***, in (partial) fulfilment of the requirements for the degree of Master of Medicine (Obstetrics and Gynaecology) of the Muhimbili University of Health and Allied Sciences.

……

PROF. CHARLES .S. KILEWO

(Supervisor)

Date.....

DECLARATION AND COPYRIGHT

I, **Moris Philip Mwanyika**, declare that this **dissertation** is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

Signature..... Date……..

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DEDICATION

This work is dedicated to my father, the late Philip Moris Mwanyika who passed away during the time of data collection for this work. I will always miss you dad, R.I.P.

It is also dedicated to my fiancee Ritha Dallo and my son Philip-Melvin Moris Mwanyika who were always there for moral and material support.

ABSTRACT

Background: Tanzania has adopted the World Health Organization recommendation of initiating lifelong anti-retroviral treatment to all pregnant and lactating mothers infected with human immunodeficiency virus(HIV) regardless of disease immunological or clinical stage with the aim to eliminate mother to child transmission(eMTC) of HIV. Challenges in consistently attending care and treatment services as scheduled have been reported, this study seek to find out whether such factors also affect PMTCT option B+ program.

Objective: To determine factors associated with missing appointments in prevention of mother to child transmission of HIV (Option B+) program in Njombe town Council

Methods: Descriptive cross-sectional study with a sample size of 196 participants. Interviewed responses were analyzed using SPSS version 20.0. Chi square was performed to determine the association between the independent variables and the dependent variable. Odds ratios were calculated to assess the likelihood of some factors that were found significant.

Results:A total number of 196 participants were interviewed of which 37% reported to have been missingclinic since ART initiation. Age group above 35 years had increased risk of missing appointments in the PMTCT clinics (AOR=1.7, 95%CI=0.51-6.07). However, this age group has no statistical significance since 95% CI includes one. Divorced women (AOR=12.2, 95% CI=1.77-85.8), education level secondary school and above (AOR=12.2 95% CI=1.77-83.8),norms and beliefs (AOR=4.1, 95% CI=1.71-9.92), religious beliefs (AOR=4.4, 95% CI= 1.25-15.67), those with little community cooperation (AOR=9.9, 95%CI=1.68-59.0) were more likely to miss PMTCT clinics. Economic factors studied with the exception of lack of road accessibility throughout the year were not associated with missing clinic. Those who experienced lack of privacy (AOR=3.582, 95% CI=1.59-8.06), dissatisfaction(AOR=8.8, 95% CI= 3.07-25.61), spending much time at clinic(AOR=1.8, 95%CI=1.37-8.23)weremore likely to miss clinic appointments.

Conclusion: More strategies and sustainability measures for improving attendance into PMTCT services in Njombe Town Council like tracking system using home based care services, community health worker for maximum impact in tracing clients' early need to be revised and improved.

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LIST OF ABBREVIATIONS

ARV	-	Antiretroviral
CI	-	Confidence Interval
CTC	-	Care and Treatment Centre
HIV	-	Human Immunodeficiency Virus
LLAPLa	-	Life Long ARVs for Pregnant and Lactating mothers
LTFU	-	Lost-To-Follow-Up
MTCT	-	Mother-To-Child Transmission
PEPFAR	-	President's Emergency Plan For AIDS Relief
PMTCT	-	Prevention of Mother To Child Transmission
PLHIV	-	People Living with HIV
POC	-	Point-Of-Care
PROMISE	-	Promotion of Maternal-Infant Survival Everywhere
RCH	-	Reproductive and Child Health
SPSS	-	Statistical Package for Social Science
TC	-	TownCouncil
THMIS	-	Tanzania HIV/AIDS and Malaria Indicator Survey

OPERATIONAL DEFINITIONS

Missing appointment - is an act of not attending a scheduled visit

Attendance - means being present or appearing at a clinic as previously scheduled

Retention in care - means an enrolled client consistently attends scheduled visits at stated time

Loss to follow up on ART- Patients receiving ART and not seen at the clinic, or pharmacy, 90 days after the date of their last missed appointment or last missed drug pick-up and who are not known to have transferred out or died.

Adherence to ART – is the extent to which a person's behavior in taking medication (ART)corresponds with agreed recommendations from a health care provider.

INTRODUCTION

The HIV epidemic remains a major public health challenge worldwide, with devastating effects in sub-Saharan Africa. Worldwide approximately 36.9 (32.2–38.8) million people were living with HIV by 2014 and women represented half (50%) of all adult people living with HIV globally (1).HIV infected women can transmit the infection to their infants through mother-to-child transmission (MTCT). In 2013, an estimated 1.5 million pregnant women were living with HIV globally leading to more than 1,100 children younger than 15 years becoming infected with HIV every day (2).

In Sub Saharan Africa, an estimated 24.7 (23.5–26.1) million people are living with HIV which contributes to nearly 71% of the world HIV burden. HIV infected pregnant women contribute to transmission to children below 14years by more than 90%. (3) There were 3.2 million children living with HIV in 2013; 240,000 new infections among children, and 190,000 AIDS deaths (4). Tanzania is equally affected, despite the recent slight declining trend in HIV prevalence in the age group 15–49 years from 6.5% to 5.7% and 5.1% in 2004, 2007, and 2011, respectively(5).

In the absence of any interventions, the MTCT rate ranges from 15-45%, this can be reduced to below 5% with effective interventions (4). In high-income countries, the MTCT rate is less than 1% this is because of perinatal PMTCT interventions.

The Government of Tanzania joined the global plan to have an AIDS-free generation by eliminating new HIV infections among children and keeping their mothers alive through implementation of more effective strategy in PMTCT services. This strategy aims at reducing the number of new HIV infections in children by 90%, retain those initiated on ARV into care by 90% and reducing HIV related maternal deaths by 50% as per PMTCT plan 2012-2015 (6)(7). From 2000 to 2013 there has been a progressive increase in the use of ARVs in PMTCT such as initiating single dose Nevirapine (sdNVP) in 2004, to short course ARV prophylaxis in 2010 to a stratified approach with Life Long ARVs for Pregnant and Lactating Mothers (LLAPLa) which is known as PMTCT Option B plus in 2013. This current strategy refers to initiating antiretroviral therapy (ART) to all pregnant and lactating mothers who are found to be infected by

HIV regardless of their immunological status. PMTCT services provided in Tanzania include routine HIV testing and counseling, ARV treatment for mothers and prophylaxis for children, safer delivery practices, counseling and support for safer infant feeding practices, long-term follow-up care for mother and child and family planning(8) (25).

Njombe is the leading region in Tanzania with the highest prevalence of HIV (14.8%). Prevalence is higher among women (15.4%) than men (14.2%) (5). PMTCT Option B+ services in Njombe started since October 2013. Njombe Town Council has 47 health facilities that provide PMTCT Option B+ services. PMTCT services are now included in the reproductive and child health (RCH) services whereby every woman who comes for antenatal clinic (ANC) registration is also offered provider initiated testing and counselling(PITC) services and all those who are found to be HIV infected are registered into CTC 2 card and are initiated ARV.

Preventing children from HIV infection gives them an opportunity to grow normally as other children who are not exposed to HIV infection, reaching potential developmental milestones appropriate for the age. Therefore, it is important that after initiation of ARVs as part of PMTCT program women return to the clinic for clinical evaluation, monitoring of adverse effects and adherence to medications to improve both maternal and child outcome. Despite the benefits of PMTCT services, consistent attendance of pregnant and lactating mothers into the PMTCT program is highly variable. Maintaining clinic appointments result in good retention in care when attended visits are evaluated in a certain period. However, several barriers have been found to be associated with missing of appointments. Some of the barriers identified in the care and treatment center (CTC) include socio-cultural factors such as lack of community support, psychosocial barriers related to HIV stigma. It is not documented whether the same factors affects attendance into the PMTCT Option B+ program as well. This study seeks to determine the extent to which socio-cultural, economic and institutional factors play part in missing appointments of HIV positive pregnant and lactating mothers to PMTCT Option B+ services in Njombe Town Council

In order to have maximum viral load suppression and to achieve the goal preventing mother to child transmission all pregnant women on ART must attend all the scheduled visits so that they do not miss their ART dose. Proper attendance of all scheduled visits makes these women to be retained to PMTCT services. Retention in HIV care refers to the engagement in comprehensive prevention, support, and care services regardless of site and therefore missing of appointments to PMTCT clinics among HIV-infected women has negative implications for clinical outcomes and may ultimately undermine the effectiveness of national treatment programs(3,9). Further, WHO defines four stages of adherence to treatment in the continuum of HIV care and support as follows: 1- the moment from when one tests HIV positive to enrolment in care; 2-from enrolment in care to ART eligibility assessment; 3-ART eligibility to ART initiation; and 4-continuation of treatment throughout life (4)(10).

In option B+ program the moment from when one tests positive up to the moment of initiation is much shorter because the program applies the principle of test and treat where by all who test positive are directly enrolled and initiated ART. Proper PMTCT clinic attendance without missing any scheduled visit is essential for monitoring disease progression, providing prophylactic drugs to reduce the risks of opportunistic infections, ensuring timely ART initiation, and optimizing long-term benefits of treatment. (9)

Missing clinic makes the HIV infected pregnant woman not to take her antiretroviral and her baby is unlikely to be initiated on the necessary prophylaxis after delivery, and may not be registered for regular follow-up in the PMTCT program. Hence this results in a delayed disease progress evaluation and initiation of life-saving ART. (11)

Tanzania like many other sub Saharan countries has moved towards national coverage of PMTCT services; however, most children born to women with HIV are not being systematically monitored and followed up during the postpartum period and are thus missing out the life-saving services. (9)(12).

LITERATURE REVIEW

Prevention of mother to child transmission of HIV under Option B+ program is the main pillar in making new HIV infections among children a history by achieving the goal of elimination of MTCT. But missing clinics is a major setback towards achieving the goal (15).

Maintaining clinic appointments results in retention in care of people living with HIV (PLHIV), which is now a priority under the US President's Emergency Plan for AIDS Relief (PEPFAR) of which Tanzania is among the countries supported. However, many HIV programs experience disruptions in the continuum of HIV care in various countries in sub Saharan Africa hence leading to a high rate of missing clinic appointments (3). This is supported a systematic review done by Fox in 2010 which demonstrated clients who were still adherent to schedules on ART at 24 months to be 70-80%(16). Another study in Mbarara Uganda reported that a rate of adherence to treatment on ART at 24 months to be approximately 79% to 86% (17). This is similar to a study on pregnant women in Kenya by Watson and colleagues in which they concluded that there were unacceptable high rates of loss to follow up throughout the continuum of care (18). Another study conducted among pregnant and lactating women attending PMTCT option B+ in Malawi reported that loss to follow up in the first 6months was 17% hence making the retention rate to be 83% (19). This means that, there is a habit of not continuing with HIV care services in many settings.

Despite substantial progress been made in reaching women who need PMTCT services and enroll them into care, anecdotal observations are that, many pregnant and lactating women with HIV in Africa still do not attend services monthly as expected. Some of the barriers identified include socio-cultural factors such as lack of community support, psychosocial barriers related to HIV stigma(20). In the study conducted by Ngarina et al (2013) on reasons for poor adherence to antiretroviral therapy post natally in HIV-1 infected women treated for their own health, revealed that there are multiple reasons like decreased motivation to take ART once they had protected their children from becoming infected and successfully weaned them, feeling well, and a feeling of hopelessness for others also decreased motivation to continue ART. Also it was reported that

overwhelming demands of everyday life, poverty and lack of empowerment also posed significant barriers to long-term adherence. The need to keep their HIV status a secret and not let anyone see them taking the drugs was another steep barrier. In addition, in another study it was found that, perception of stigma and discrimination was the most common factor which influenced clinic attendance negatively(14). Also denial of HIV infection results, opposition from male partners, women's fear of disclosure of HIV status to their partners or other relatives as they may be found out if taking drugs has been documented to contribute towards missing appointments in PMTCT services (2)(3). Home deliveries with or without traditional birth attendants have contributed for not returning for checkups in the month before delivery. In addition, delivering at home or with the traditional birth attendants and premature delivery before treatment also was observed as a factor contributing for clients not returning to care for continuation of services since they felt that pregnancy was the reason for them to attend at the clinic (46).

Perception and attitude towards lifelong ARVs for pregnant and lactating mothers has been reported to affect retention into care as well. Some myths that ART and ARVs makes HIV+ mothers to regain their health and therefore increase rate of promiscuity have also been reported (46). In addition, due to negative attitude towards PMTCT services there has been lack of support from their partners, which contributed to missing of appointments in PMTCT services especially with participants from nonintegrated facilities (46). Another study conducted in Iringa Tanzania looking on the barriers and facilitators of attendance to PMTCT services and overall retention in care reported that despite growing availability of HIV care and treatment services in Iringa, participants involved in the study reported to be missing clinic due to significant barriers faced, including lack of knowledge and misperceptions of treatment. In addition, access problems that included difficulties in reaching distant clinics and pervasive poverty that left PLHIV unable to cope with out-of-pocket costs associated with their care, persistent stigmatization of PLHIV and frequent reliance on alternative healing systems instead of biomedical treatment. They further reported that, positive perceptions of the efficacy of ART, improved ART availability in the region, improved access to care through

supplemental aid, and social support were perceived to enhance treatment continuation. Findings from this study suggest that, numerous socioeconomic and socio-cultural barriers inhibit retention in HIV care and treatment services in this setting. Recommendations made were intervention strategies that improve ART accessibility, incorporate supplemental aid, enhance social support, reduce stigma, and develop partnerships with alternative healers are needed to improve HIV-related outcomes(22).

Awareness and knowledge about PMTCT services is important to the community so that the goal of elimination of MTCT is achieved. Studies worldwide have reported low awareness and knowledge on the PMTCT services including Tanzania ranging from as low as 6% to 60% among childbearing age women(23). These studies were conducted when PMTCT programs were using ARVs for shorter period but now clients have to use ARVs for life. This is a new implementation program adopted in Tanzania from 2013, which needs evaluation so that focused strategy to improve knowledge can be applied. In the study by Ndonga et al (2014) regarding barriers to uptake and effective integration of PMTCT into SRH services in selected health facilities in Kenya, reported lack of knowledge of study participants regarding PMTCT services and lack of skills of Health care providers to provide adherence counseling. In another study that was looking at Knowledge, perception about antiretroviral therapy (ART), PMTCT, and adherence to ART among HIV positive women in Ghana, reported that, ART defaulter rate was 27% and clients had good knowledge about ART and PMTCT. More than 90% of the HIV positive women had inadequate knowledge about ART and PMTCT and these women were more likely to default ART (OR = 3.5; 95% CI = 1.89, 6.21). The educational background of HIV positive women did not have significant influence on their knowledge of ART and PMTCT. The study concluded that, knowledge and understanding of ART and PMTCT could influence their adherence to ART services. Educational interventions that target the understanding of both the literate and illiterate women in society are necessary so as to develop positive behaviors and enhance adherence to ART (24).

Socio-economic factors have been reported as contributing factors to the missing of appointments in PMTCT programs. Factor like lack of money for transport to health service delivery points is among the socio-economic factor leading to missing of appointments. It was found that, most of women have lower education in the villages and this leaves women without control of their health matters depending to their life partners for permission to attend services as well as money for transport and other needs. This in a way impairs women from adhering to PMTCT services despite the fact that they have gone through the adherence counseling and understood the importance of PMTCT. Similar findings were reported by another study that low economic status to be one of the reasons of not disclosing HIV status to their partners for the fear of repercussions like divorce or separation if the husband or partner found to be HIV negative(47). Poverty has been regarded as barrier in accessing health services including PMTCT services in Kenya(25) and in India (48). It has been reported that despite PMTCT services are free of charge, high transport cost to health care facilities, and pressure to raise money for bare survival is a more priority than attending PMTCT services for clients who are otherwise health**.** In the study to explore patients' and health care professionals' perceived barriers and facilitators to patients' adherence to ART by Sanjobo N and his colleagues (26) reported that lack of communication and information about ART, inadequate time during consultations. Also lack of follow-up and counseling, forgetfulness, stigma, discrimination and disclosure of HIV status, lack of confidentiality in the treatment centers, and lack of nutritional support. On the other hand; Feeling better, prospects of living longer, family support, information about ART, support for income-generating activities, disclosure of HIV status, prayers and transport support were among the facilitators. Factors contributing to missing appointments in PMTCT program can be partly from the health facility level (46). Among the factors contributing to low retention rate were high volume of clients seeking RCH services including PMTCT, increase in waiting time by clients, increase in staff workload resulting to burnout and hence potential compromise on quality of services provided. A study on the influence of patient-provider interactions on prevention of mother-to-child transmission of HIV service use in rural Tanzania found that, trust in providers was limited by confidentiality concerns, and some HIV-positive women were anxious about

referrals to other facilities after establishing trust in their original providers. They further reported that good care was recounted by some women, but many study participants described disrespectful staff including discrimination of HIV-positive patients and scolding, particularly during delivery; exacerbated by lack of materials (gloves, sheets) and associated costs, which frustrated staff. Experienced or anticipated negative staff behavior influenced adherence to subsequent PMTCT components. Findings revealed a pivotal role for patient-provider relations in PMTCT service use. They recommended strategies should address staff behavior, emphasizing ethical standards and communication, and empower patients to seek information about available services. Optimizing provider-patient relations can improve uptake of maternal health services more broadly, and ART adherence.These shortfalls in the health system might discourage clients to continue attending services in such environment and contribute to lost to follow up in the future if they do not have acute medical condition that necessitate them to see a doctor. It was reported that some PMTCT health care workers have limited knowledge and skills on ARV prophylaxis and on follow-up care, such as continuing replacement feeding supplies, infant testing and services for HIV-infected mothers and exposed infants as well as inconsistency in provision of drugs and other supplies(27). Another study on adherence to combination prophylaxis for prevention of mother-to-child-transmission of HIV in Mbeya - Tanzania identified risk factors for declining pre-delivery prophylaxis included maternal age below 24 years, no income-generating activity, and enrolment before 24.5 gestational weeks, with odds ratios of 5.8 (P = 0.002), 4.4 (P = 0.015) and 7.8 (P = 0.001), respectively. Disclosure of HIV status to partners in this study was observed to have impact on the retention into care. Women who stated to have disclosed their HIV status were significantly more adherent in the pre-delivery period than women who did not (P = 0.004)(28).

In a review of 42 articles conducted in 2014 by Iwelunmor and colleagues, it was found that, factors that positively influence participation in PMTCT services includes availability, accessibility, acceptability, and affordability of services. They further reported that other factors are confidentiality of HIV test results, privacy at the clinic, availability of health education programs surrounding PMTCT and access to family

planning services, HAART, support groups, and counseling services for HIV positive women. Other factors which were reported to influence positively the participation in PMTCT services are family and/or community support and spouse/partner support after disclosure of HIV status(14).Similar findings were reported by another study , which clearly noted that, patients on ART experience a range of barriers for failing to adhere to ART services. It further reported that, financial difficulties, access to healthcare services, frequent transport blockades, religious/ritual obstacles, stigma and discrimination, and side effects are the most-frequently discussed barriers whereas trustworthy health workers, perceived health benefits, and family support are the most-reported facilitators(29). All these factors described above were observed in the general HIV care and treatment programs and PMTCT programs other than option B+ programs. It is not known to what extent these factors are associated with missing appointments in option B+ program.

PROBLEM STATEMENT

The great challenge in PMTCT OptionB+ is to engage and maintain all HIV infected pregnant women and lactating mothers in life long ARVs.Despite the benefits of PMTCT services discussed, adherence to schedule for pregnant and lactating mothers into the PMTCT program has been low in most developing countries due to various associated factors. In Tanzania there is limited data reporting on factors associated with missing of appointments in Option B+ program. The U.S. President's Emergency Plan for AIDS Relief (PEPFAR) Report of 2013 reported challenges contributing missing PMTCT clinic. Among them are limited pre-ART services, distance to health care centers, transportation costs, and male gender, younger age, and unemployment, lower levels of education, stigma and fear of disclosure of HIV status. These challenges have been addressed in a number of ways including task shifting, use of community based health workers and peer educators, informational campaigns to decrease HIV stigma, Collaboration with traditional leaders, client literacy and education campaigns, nutritional programming, income generating activities, legal and child protection programming, point-of-care (POC) services, and employment of supply chain mechanisms. All these factors and solutions provided have been observed in the general

care and treatment (CTC) programs; now that PMTCT option B+ program; it is not known whether the same factors or new factors are contributing to missing of appointments in this program too. So this study seeks to find out whether these factors are also associated with missing appointments in PMTCT option B+ program.

STUDY RATIONALE

The results of the study will help to improve attendance in PMTCT services in Njombe Council and Tanzania in general because factors associated with missing appointments to the services will be addressed. In addition, the findings from the study will help then Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC) when scaling up PMTCT services to new sites in the country may take into consideration these factors. PMTCT coordinators will be in a position to use the results in setting new targets for improving attendance and put budget for addressing the bottlenecks identified. In addition, the information will be useful to academicians and medical practitioners to use as a basis for further research in issues concerning PMTCT services since it is a new intervention in the country.

RESEARCH QUESTIONS

What are the factors contributing to missing appointment for pregnant and lactating women in a PMTCT option B plus program in Njombe T.C in September 2016

BROAD OBJECTIVE

To determine factors associated with missing appointments in prevention of mother to child transmission of HIV (Option B+) program in Njombe town Council in September 2016

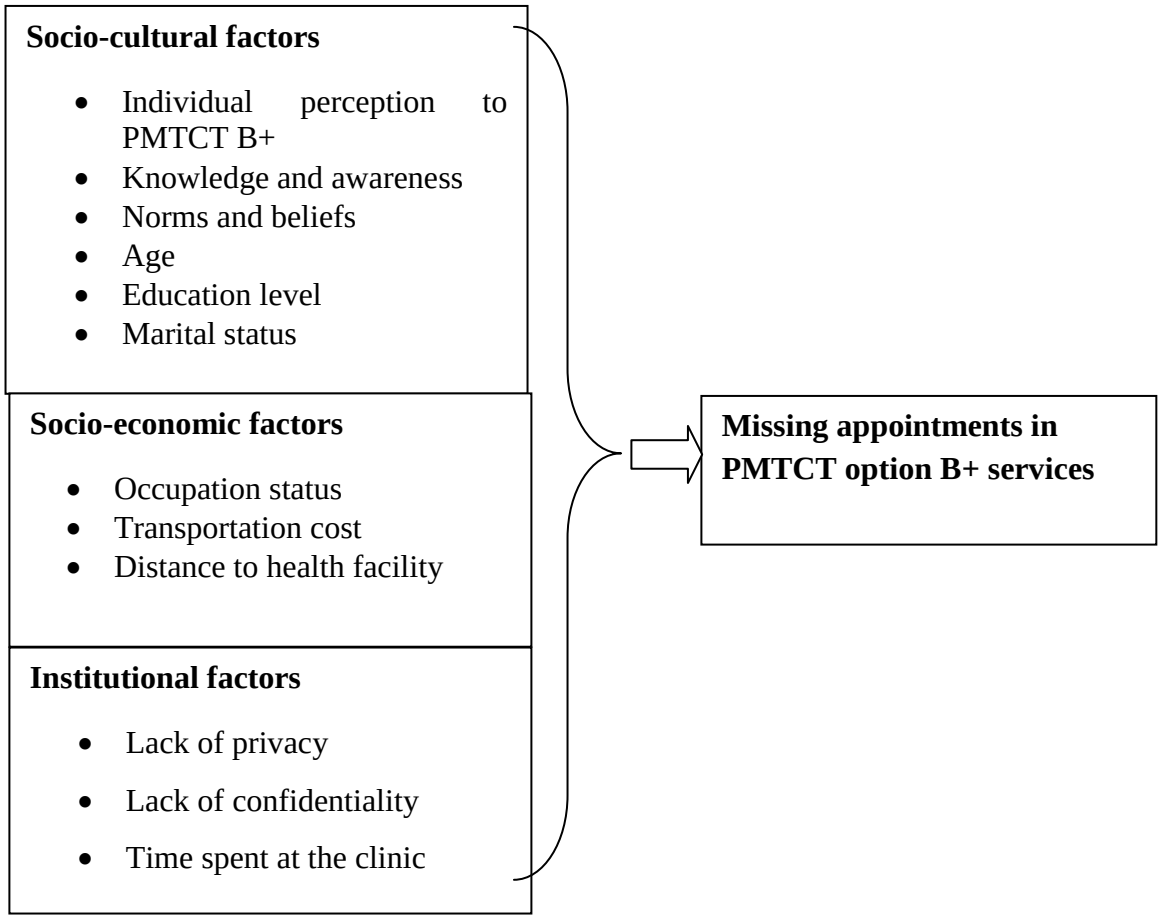
SPECIFIC OBJECTIVES

1. To determine reasons for missing appointments as reported by pregnant and lactating women in a PMTCT option B plus in Njombe T.C in September 2016.
2. To determine the association of socio-cultural, economic and institutional factors and missing of appointment for HIV infected pregnant and lactating mothers' on lifelong ART care in Njombe Town Council in September 2016.

CONCEPTUAL FRAMEWORK.

This study assumed that socio-cultural factors (individual perception to PMTCT B+, marital status, stigma, knowledge and awareness, norms and beliefs, age, education level, and marital status), socio-economic factors (income, occupation, transportation fare, time spent at the clinic, distance to health facility),and institutional factors (privacy, confidentiality and availability of trained personnel) as independent variables, are important in influencing whether a woman will attend PMTCT services at a health facility. The conceptual framework is presented in following figure:

Independent variables Dependent variable



METHODOLOGY

Study Area

The study was conducted in Njombe Town Council which is one of the 6 councils in Njombe. It was chosen as study area because Njombe region has highest prevalence OF WHAT? in Tanzania and Njombe town council (TC) has highest prevalence and the largest population as compared to other councils. The most recent THMIS study in 2012 described the HIV prevalence in Njombe as 14.8% which is the highest in the country. A large proportion of women (15.4%) than men (14.2%) are infected. HIV prevalence in Iringa region declined from 15.7% to 9.1%when Njombe was delineated as a new region. Njombe TC has several health care facilities that provide services for pregnant and lactating mothers who are HIV positive and therefore we expect to get enough data on the rate of retention and attrition. The population of Njombe TC is 130,223 as per 2012 Census and the HIV prevalence among women of reproductive age is 15.4% (5). There are 47 facilities in Njombe TC that provide PMTCT services as per national protocol.

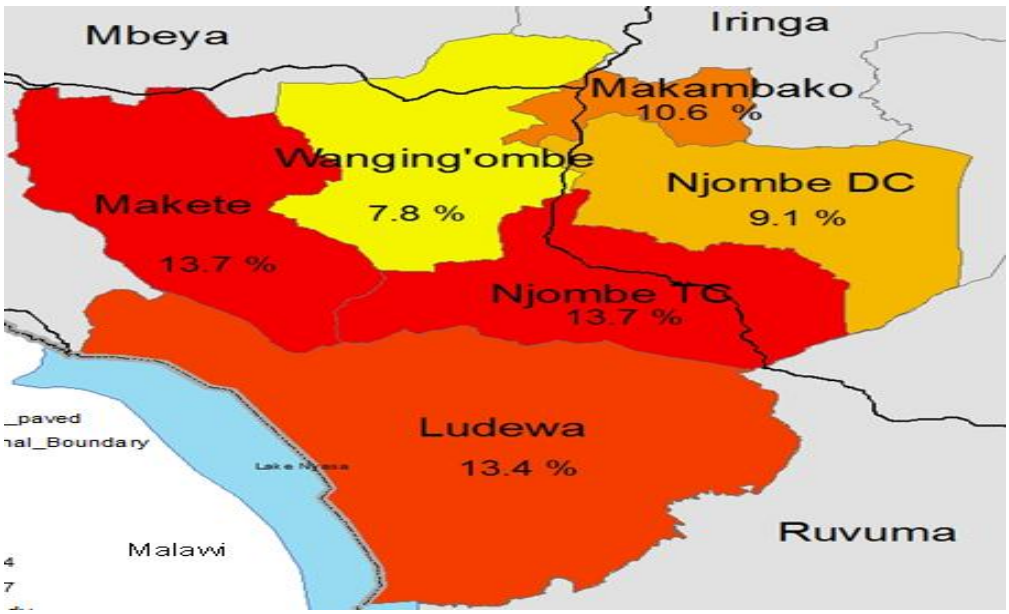


Figure 1. Map of Njombe region (Njombe report 2015)

Study Population

This study involved HIV infected pregnant women and lactating mothers attending PMTCT option B+ Services in Njombe Town Council

Inclusion Criteria

i. HIV infected pregnant or lactating women registered for PMTCT option B+ services
ii. Has been in the program for more than four months
iii. Consented to participate in the study by signing the consent form

Exclusion Criteria

Those who are very sick at the time of data collection such that they cannot respond to questions

Study Design

This was a cross sectional descriptive study conducted in Njombe Town Council in September 2016 among HIV infected pregnant women and lactating mothers attending PMTCT option B+ Services in Njombe Town Council. Study participants were interviewed using a structured questionnaire.

Sample Size calculation

Sample size was calculated using the following proportion formula

$$n = \frac{Z^2 P(1-P)}{C^2}$$

Where by n = Sample Size, Z = Z-value which is 1.96 for a 95 percent confidence level, P = Percentage of study population, attendance to PMTCT program expressed as decimal, in this study rate of attendance of 85% was taken as reference as reported by a study conducted in Mbarara Uganda (17). C = Margin of error, expressed as decimal and in this study 0.05 was used

Therefore the minimum sample size used in this study

$$\frac{(1.96)^2 \times 0.85 \times (1-0.85)}{(0.05)2} = 196 \text{ participants}$$

Sampling Methods

This study employed a non-random purposive sampling in selecting health facilities to conduct data collection. This technique was opted because each individual health facility was chosen depending on the volume of clients where by a facility with a minimum number of 30 clients visiting per day was selected. Njombe T.C has 47 health facilities that provide PMTCT services, among them there is one hospital, six health centers and 40 dispensaries. This study was conducted in 7 health facilities that is, 1 Hospital (Kibena regional Hospital), 4 health centers (Njombe Town, Anglican, Idundilanga and Uwemba), and 2 dispensaries (Ndzengerendeti, Iwungilo) which were purposively selected depending on their volume of clients. The study participants were interviewed during routine services as they exit from PMTCT room.

Methods of Data Collection

For each facility the principal investigator (PI) oriented research assistants on the interview guide and then pretesting of the questionnaires was done. Interviews were conducted at RCH units where PMTCT services are provided. Participants were allowed to follow the normal RCH routine care where by on arrival at the clinic, nurses gave health education on pregnancy and postnatal-related issues including PMTCT and nutrition services as usual. Clients in the PMTCT roomwere invited individually to participate in the study and those who agreed were given a consent form to sign. A convenient place was identified by the researcher and once agreed upon by the consenting women, interviews were conducted using a questionnaire. The questionnaire was partly designed by the PI and partly adapted part from Tanzania Demographic and health survey (30) and the scales from Likert-type scales, statistical methods and effect sizes (31) . The questionnaires were pretested and revised before the real study data collection took place. It was drafted in English and translated into Swahili, this was translated back to English, and the two English versions were compared for similarity. The questionnaires were given code numbers from one to one hundred and ninety six. Names of participants were not written for confidentiality but the site names were recorded on top of the questionnaire. The interview was offered under great privacy and the face-to-face opportunity which helped to build the rapport that was necessary for participants to feel comfortable discussing extremely personal and sensitive issues with a

researcher they just met as reported (32). Study participants were thanked for their cooperation and assured that their information will be confidential and will not be tied to their identity

Data Analysis

All filled questionnaires were coded before double entry into the Statistical Package for Social Sciences (SPSS) databases. Data cleaning was done in terms of consistency checks for outliers and missing data. Data analysis was done using SPSS 20.0, and the results presented in odds ratio. Data was summarized in contingency tables, and percentages of responses in each category. Chi square was performed to determine the association between the independent variables (socio-cultural, economic and institutional) on the dependent variable (attendance to PMTCT option B+ services). Bivariate and multivariate analysis were done in order to determine crude and adjusted P-values where by those of less than 0.05 were considered statistically significant

Ethical Consideration

Ethical clearance was sought from MUHAS ethical committee. Permission to collect data was granted by RMO, DMO and head of departments in Njombe T.C. Privacy was ensured by looking for a separate space away from the PMTCT room, anonymity was ensured by coding questionnaires with numbers (no names). No risk to the participants occurred from this study as it did not involve blood tests. On the contrary, there was community and scientific benefit of establishing the factors which facilitates or hinders attendance of HIV infected pregnant and lactating women in the LLAPLa program. From every participant an informed written consent was sought and every client was free to participate or not participate and without interference with treatment protocols.

RESULTS

Sample Size Description and Characteristics of Respondents

The study comprised of 196 respondents with mean age28.5 yearsranged from 20years to 40years, with largest age category of 30 to 34 years and smallest being from 35 years and above. Majority of respondents (81.1%) had primary education, 66.8% were married and 66.7% were lactating mothers. **Table 1**. However, about two third (62.8%) of all participants had never missed attendance since they were enrolled. **Figure 2.**

More than 80% of the study participants were aware about the periods when MTCT can happen. Similarly, more than 90% knew ways how HIV can be prevented from mother to child. **Table 2.**

Table1: Respondent's Characteristics (n = 196)

Variable	Category	Frequency (n=196)	Percentage, %
Age categories	20 -24	54	27.6
	25 -29	55	28.1
	30 -34	66	33.7
	35 and above	21	10.7
Marital status	Single parents	52	26.5
	Married	131	66.8
	Divorced/separated	12	6.6
Educational level	No formal education	10	5.1
	Primary school	159	81.1
	Secondary School and above	27	13.8
Time since initiation ARV	Less than 1 year	98	50
	More than 1 year	98	50
Occupation status	Employed	7	3.6
	Business women	65	33.2
	Unemployed/ peasant	86	43.9
	Housewife	38	19.4

Figure 2: PMTCT option B+ attendance among participants.

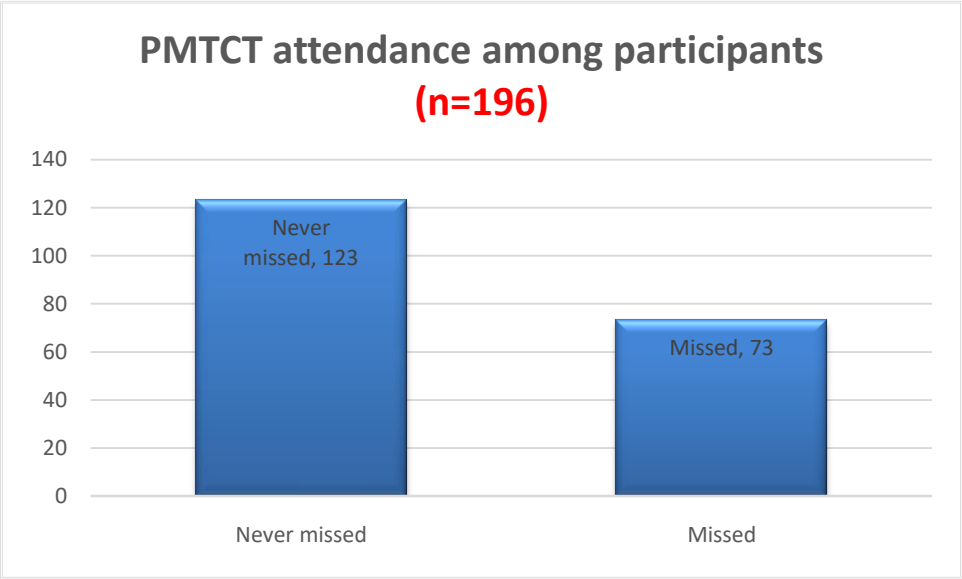


Table 2: Awareness on PMTCT topic among participants (n=196)

Variable	Frequency (n=196)	Percentage
Periods of HIV transmission (MTCT):		
During pregnancy		
Yes	180	92%
No	16	8%
During delivery		
Yes	170	87%
No	26	13%
During breastfeeding		
Yes	174	89%
No	22	11%
Ways of preventing mother to child transmission of HIV:		
Taking ARVs for life even during pregnancy and lactation		
Yes	192	98%
No	4	2%
Providing ARV prophylaxis to children born to infected mothers at birth to 6weeks of life		
Yes	195	99%
No	1	1%
Practicing exclusive breastfeeding		
Yes	180	92%
No	16	8%

Reasons for missing appointments as reported by participants.

Traveling was the common reason (21%) given by the participants followed by lack of bus fare or transport (17%) and being very sick (16 %).**Table 3**.

Table3: Reasons for missing appointments (n=73)

Reasons	Frequency	Percentage
TRAVELLED	15	21%
WAS VERY SICK	12	16%
BUSY WITH ECONOMIC ACTIVITIES	9	12%
NO BUS FARE/NO TRANSPORT	13	17%
TIRED OF MEDICATION	5	7%
WAS FEELING NOT SICK	5	7%
ALTENATIVE MEDICINE	4	5%
WENT TO PRAYERS AND BELIEVED CURED	4	5%
FORGETTING	3	4%
STIGMA OF RELATIVES	3	4%

Association Between Socio-demographic Variables and Missing Appointments

Age group above 35 years had increased risk of missing appointments in the PMTCT clinics (AOR=1.7, 95%CI=0.51-6.07). However, this age group has no statistical significance since 95% CI includes one. Women who were divorced were (AOR=12.2, 95% CI=1.77-85.8) more likely to miss PMTCT clinics compared to those who were single. On the other hand, women with secondary education and above were (AOR=12.2 95% CI=1.77-83.8) more likely to miss PMTCT clinics as compared to those with no formal education. Being housewife was found to be protective factor, as housewives were (AOR=0.4, 95% CI=0.13-0.98) likely to miss PMTCT clinics as compared to businesswomen. Other factor like maternal status(whether pregnant or lactating)and duration on ARVs were not associated with attendance to PMTCT clinics. **Table 4**

Table4:Association between socio-demographic variables and missing appointments

Variable	Category	N (%)	AOR(95%CI)	p-value
Age categories	20 -24	23(42.4)	Ref	
	25 -29	17(30.9)	0.6(0.26-1.48)	
	30 -34	21(31.8)	0.3(0.09-0.69)	0.007
	35 and above	12(57.1)	1.7(0.51-6.07)	
Marital status	Single parents	22(42.3)	Ref	
	Married	40(30.5)	0.9(0.41-2.02)	
	Divorced/separated	11(84.6)	12.2(1.77-85.8)	0.011
Education level	No formal education	1(10.0)	Ref	
	Primary school	66(41.5)	6.7(0.78-57.12)	
	Secondary School and above	6(22.2)	12.2(1.77-83.8)	0.011
Mother status	Pregnant	33(50.0)		
	Lactating	40(30.8)	0.6(0.29-1.46)	0.309
Occupation status				
	Business women	31(47.7)		
	Unemployed/ peasant	33(38.4)	0.6(0.28-1.37)	
	Housewife	9(23.7)	0.4(0.13-0.98)	0.047

Other factors, which were investigated in this study to find their association with missing PMTCT clinic attendances, were **norms and beliefs, transportation factors** and **constitutional factors**. Each of these major factors stated above were analyzed separately.

Various norms and beliefs were assessed, and it was found that women who were generally much affected by norms and beliefs were (AOR=4.1, 95% CI=1.71-9.92) more likely to miss PMTCT clinic as compared to those who were not affected at all. Indeed, women who were moderately affected by their religious beliefs were (AOR=4.4, 95% CI= 1.25-15.67) more likely to miss PMTCT clinic as compared to those who were very much affected by their religious beliefs. Moreover, those who gained very little community cooperation were (AOR=9.9, 95%CI=1.68-59.0) more likely to miss PMTCT clinic as compared to those who gained much community support. Other norms and beliefs like partner cooperation, disclosure of HIV status to partner and family cooperation were not associated with missing PMTCT clinics. **Table 5** and **Table 6**

Table5:Univariate analysis showing associationbetween Normsand Beliefs and missing appointments

Norms and beliefs	Never missed(N=123)	Missed (N=73)	COR 95% CI	P- value
Were norms and beliefs in your society make HIV+ pregnant and lactating mothers not to be involved in PMTCT services?				
No	111(66.5)	56(33.5)	2.8	0.01
Yes	12(41.4)	17(58.6)	1.24-6.41	
Does your religious beliefs affect you from attending to the PMTCT services				
No	114(62.6)	68(37.3)	0.9	0.90
Yes	9(64.3)	5(35.7)	0.27-2.90	
Does discrimination affect your attendance to PMTCT services				
No	73(62.9)	43(37.1)	1.0	0.95
Yes	50(62.5)	30(37.5)	0.56-1.84	
Disclosure status to partner				
Yes	100(62.3)	58(36.7)	1.1	0.75
No	23(60.5)	15(39.5)	0.53-2.32	
Does your spouse/partner give you cooperation to attend PMTCT services				
No	18(34.0)	35(66.0)		0.0001
Yes	82(78.1)	23(21.9)		
Disclosure HIV status to community/family				
Yes	98(65.3)	52(34.5)		0.178
No	25(54.3)	21(44.7)		
Does your family support you to attend PMTCT services?				
No	12(26.7)	33(73.3)		0.0001
Yes	86(81.9)	19(18.1)		

Table6:Multivariate analysis showing association between norms / beliefs/ disclosure and missing appointments

Norms and beliefs	Missed(N=73)	AOR(95% CI)	P-value
To what extent do the norms and beliefs in your society make HIV+ pregnant and lactating mothers not to be involved in PMTCT services?			
Not at all	44(29.1)		
Little	12(75.0)	3.1(0.71-13.87)	
Much	17(58.6)	4.1(1.71-9.92)	0.002
To what extent does your religious beliefs affect you from attending to the PMTCT services			
Not at all	52(32.3)	0.6(0.25-1.58)	
Some how	16(76.2)	4.4(1.25-15.67)	0.021
Much	5(35.7)	Ref	
Gets partner cooperation			
Not at all	22(68.7)		
Little/very little	28(61.9)	0.5(0.12-2.38)	
Much/very much	23(21.9)58	0.4(0.09-1.57)	0.189
Gets community cooperation			
Not at all	32(52.3)		
Little/very little	22(91.6)	9.9(1.68-59.05)	0.011
Much/very much	19(18.1) 52	0.3(0.08-1.28)	

Transportation cost and distance from home to PMCT clinic were other factors which were assessed to find their association with missing clinic attendance. Transport fare, average distance from home to clinic, mode of transport and road accessibility throughout the year were found to affect PMTCT clinic ($p<0.05$).

It was found that 82.4% of women who were not affected by transport fare at all never missed clinics as compared to 43.3% of women who were affected by transport fares. Moreover, more than three quarter (83.1%)of women who lived within 5 kilometers from PMTCT clinics and used to walk to and from the clinics never missed clinics as compared to less than a half (49.6%) of women who lived beyond 5 kilometers and needed car or bus to reach the clinic.

Again, more than half of respondents (66.1%) who could not access their roads throughout the year missed PMTCT clinic as compared to less than one third (24.8%) of respondents who had access to their roads towards the clinic throughout the year. However, in logistic analysis only road accessibility throughout the year was found to affect PMTCT clinic attendance as those who could not access their roads towards clinic were (COR=2.4, 95% CI=1.06-5.34) more likely to miss PMTCT clinics compared to those who could access their roads throughout the year.**Table 7**and**Table 8**

Table7:Association between Transport fare andDistance to clinic and missing appointments

Transportation costs	Never missed N=123(%)	Missed N=73(%)	P value
To what extent does the transport fare affects your attendance to this clinic for PMTCT services			
Not at all	61(82.4)	13(17.6)	0.000
Very little	20(80.0)	5(20.0)	
Much	42(43.3)	55(56.7)	
Who is responsible for paying your transport fare when coming for PMTCT services			
Myself	70(54.4)	49(45.6)	0.157
Husband/partner	53(68.8)	24(31.2)	
Distance to health facility			
To what extent distance from where you live to the facility where you receive PMTCT services affects your attendance			
Not at all	51(85.0)	9(15.0)	0.000
Very little	21(80.8)	5(19.2)	
Much	51(46.4)	59(43.6)	
Average km to the facility			
Below 5km	64(83.1)	13(16.9)	0.000
>5km	59(49.6)	60(50.4)	
Type of transport to the facility			
Walking	34(87.2)	5(12.3)	0.002
Bicycle/motorcycle	25(55.6)	20(44.4)	
Car/bus	64(57.1)	48(42.9)	

Table8: Multivariate analysis showing association between Transport fares andDistance to clinic and missing appointments.

Transportation costs	Missed clinic(N=73)	AOR	P- value
To what extent does the transport fare affect your attendance to this clinic for PMTCT services			
Not at all(74)	13(17.6)		
Very little(25)	5(20.0)	0.5(0.11-2.50)	
Much(97)	55(56.7)	0.9(0.21-4.35)	0.953
To what extent does the distance from where you live to this facility affects your attendance			
Not at all	9(15.0)		
Very little	5(19.2)	0.8(0.16-3.77)	
Much	59(53.6)	0.7(0.11-4.56)	0.721
Means of transport to the facility			
Walking	5(12.8)		
Bicycle/motor	20(44.4)	2.4(0.53-11.25)	
Car/bus	48(42.8)	0.7(0.35-4.27)	0.756
Road accessibility throughout the year			
Yes	34(24.8)		
No	39(66.1)	2.4(1.06-5.34)	0.036

Institutional factors analyzed in this study were **privacy, confidentiality and services satisfaction.** Those who did not experience privacy during provision of PMTCT services were (AOR=3.582, 95% CI=1.59-8.06) more likely to miss PMTCT clinics as compared to those who experienced enough privacy when receiving PMTCT services. Those who were not satisfied with PMTCT services were (AOR=8.8, 95% CI= 3.07-25.61)more likely to miss PMTCT clinics as compared to those who were satisfied with PMTCT services.Spending much time in the clinic significantly influenced missing clinic attendances as women who spent more than one hour in the clinic were (AOR=1.8, 95%CI=1.37-8.23) more likely to miss clinics as compared to those who spent less than one hour in the clinic.**Table 9**and **Table 10**

Table9: Association between institutional factorsand missing clinic appointments

Privacy	**Never missed (N=123)**	**Missed (N=73)**	**P value**
Is there enough privacy at health facility when receiving PMTCT services?			
Yes	112(67.5)	54(32.5)	0.001
No	11(27.5)	19(74.5)	
To what extent does confidentiality of HCWs in this facility affects your attendance to PMTCT services?			
Not at all	7(50.0)	7(50.0)	0.143
Very little	57(64.8)	31(35.2)	
Very Much	59(62.8)	35(37.2)	
Are PMTCT services provided in this health facility satisfactory?			
Strongly agree	67(76.1)	21(23.9)	0.012
Agree	34(57.6)	25(42.4)	
Disagree	22(44.5)	27(55.5)	

Table10:Multivariate analysis showing association between institutional factors and missing appointments

Institutional factors	Missed(N=73)	AOR(95%CI)	P-value
Is there enough privacy in this institution?			
Yes	54(32.5)	Ref	0.002
No	19(63.3)	3.58(1.59-8.06)	
Is there enough confidentiality in this institution?			
Yes	53(32.6)	Ref	
No	20(53.1)	5.42(2.24-13.10)	0.001
To what extent lack of confidentiality in this institution hinder your attendance?			
Much/very much	47(62.0)	7.55(1.09-52.35)	0.041
Little	26(15.4)	Ref	
Are PMTCT services in this facility satisfactory?			
Strong agree	41(26.2)	Ref	
Agree	15(30.4)	3.55(1.510-8.38)	0.004
Disagree	17(43.3)	8.87(3.074-25.61)	
To what extent does time spent while awaiting forservices affects your attendance to PMTCT services?			
Not at all/little	8(8.8)	Ref	
Much/very much	65(61.9)	15(4.59-50.31)	0.0001
Average time spend at the clinic			
One hours	4(7.3)	Ref	
Above 1 hours	69(48.9)	1.8(1.37-8.23)	0.476

DISCUSSION

Linking and retaining pregnant and lactating women, living with HIV in care and treatment program to improve health outcomes and control the epidemic is a priority under the PMTCT Option B+ program. The Tanzania PMTCT report 2015 showed that a number of clients are missing clinicafter enrolment.These predispose their infants to transmission of HIV. Due to this, the transmission rate, which was suppressed by ARVs during pregnancy and at birth, increases and becomes high when tests are done at 18months due inconsistent use of ARVs. This study seeksto discuss factors that contribute to missing of appointments in PMTCT services in Njombe Town Council in September 2016.

A total of 196 pregnant and lactating women were involved in this study of which two third reported never missed clinics since initiated ARV. This is a good sign for the PMTCT program achieving its intents in preventing MTCT and reducing transmission rate to less than 5%(5). Participants who reported to miss clinic visits after ART initiation were asked to list down reasons and the most reason was that they travelled (21%)to other places and therefore they did not collect their ARVs in time or some may have collected the medicine from another clinic while on journey. The other reason is that they were very sick on their appointment day(16%) and others were busy with income generating activities (14%). Those who were very sick were supposed to get ARV delivery through home based care attendants but because they did not report early about being very sick then they did not get the medicine in time.The results are similar to what was reported by a study by Ngarina in 2013 that overwhelming demands of everyday life, poverty and lack of empowerment also posed significant barriers to long-term schedule adherence(21).Another study looking on the barriers and facilitators for clients to continue with HIV care and treatment services in Iringa, Tanzania reported that despite the growing availability of HIV care and treatment services in Iringa, participants involved in the study reported significant barriers, including lack of knowledge and misperceptions of treatment. In addition, access problems that included difficulties in reaching distant clinics and pervasive poverty that left PLHIV unable to cope with out-of-pocket costs associated with their care. Also persistent stigmatization of PLHIV and frequent reliance on alternative healing systems instead of biomedical

treatment. They further reported that, positive perceptions of the efficacy of ART, improved ART availability in the region, improved access to care through supplemental aid, and social support were perceived to enhance treatment continuation(22)

In this study, facilitators for clients to continue with HIV services were documented and the most frequent mentioned reasons were that they are protecting their children from MTCT (53%) followed by those whose health in general has very much improved and therefore they want to maintain it. Another study in Mbeya reported high odds in missing clinic when clients are introduced to Lifelong ARVs when they feel not sick(34)

Looking the level at which several factors like socio-cultural, demographic, economic, and institutional factors contribute to missing of appointments of HIV+ pregnant and lactating mothers to PMTCT option B+ services: Age group above 35 years had increased risk of missing appointments in the PMTCT clinics (AOR=1.7, 95%CI=0.51-6.07). However, this age group has no statistical significance in predicting attendance since 95% CI includes one. The findings in this study are similar to results from analysis of routinely collected data for policy decisions report – Tanzania, 2016 by Price water House Coopers. It was reported that adolescents and young women (10-24 years), attendancetoPMTCTclinic was better, but the decline was sharper from 93% at 3 months to 69% at 12 months. This means that young age are adherent to services possibly due to their longer expectations in life as compared to older ones who think they are already there.

In marital status: being divorced/separated Women who were divorced were (AOR=12.2, 95% CI=1.77-85.8) more likely to miss PMTCT clinics compared to those who were single. On the other hand, women with secondary education and above were (AOR=12.2 95% CI=1.77-83.8) more likely to miss PMTCT clinics as compared to those with no formal education. Being housewife was found to be protective factor, as housewives were (AOR=0.4, 95% CI=0.13-0.98) less likely to miss PMTCT clinics as compared to businesswomen. Other factor like maternal status (whether pregnant or lactating) and duration on ARVs were not associated with missing PMTCT clinics.

The study population was assessedto find out how aware they areabout PMTCT related issues. The assumption of this variable was most of HIV+ Pregnant and lactating

mothers are unawareabout PMTCT related topics like at what periods of transmission and preventive measures thatiswhy they tend to miss clinic visit. The good knowledge on the MTCT is a very good strength in the prevention since is easier for them to adhere to the preventive measures.More than 80% of the study participants were aware about the periods when MTCT can happen. Similarly, more than 90% knew ways how HIV can be prevented from mother to child. Results from this study are similar to results from Nigerian study, which looked on the knowledge and perception on PMTCT among women of reproductive age group in Osogbo, Southwestern Nigeria in 2013. They reported that 387(92.1%) knowing a HIV+ mother can infect her child with HIV, while 292 (69.5%), 333 (79.3%), 363 (86.4%), and 239 (56.9%) agreed that MTCT of HIV takes place in utero, during delivery, through breastfeeding, and through invasive tests, respectively(35).

In this study more than 79% combined from all groups knew that MTCT occurs during pregnancy, labor and delivery, and during breast feeding. In assessing ways to prevent MTCT of HIV, majority (96.7%) of the participants from the group that had never missed visits and 100% of those who had ever missed a visit mentioned the use of ARVs for life which lowers the viral load to undetectable level and minimizes chances of transmission. Giving prophylaxis to newborns and practicing exclusive breastfeeding was mentioned as a way of preventing HIV transmission from infected mother to her child by the participants in the group that missed visits as compared to the group and the difference between the two category was statistically significant (P = 0.008 and 0.006 respectively). There was significant number in the both groups who had beliefs that casual contact such as hugging, handshakes, Insect bites like mosquitoes, sleeping in same room with infected individuals, using swimming pools and public toilets are among modes of HIV transmission from one person to another. With these results, more emphasis during HIV counseling and testing is needed on the mode of HIV transmission since one may be discriminated at home believing can transmit HIV to others through casual contacts and insect bites.Studies worldwide have reported low awareness and knowledge on the PMTCT services including Tanzania ranging from as low as 6% to 60% among child bearing age women(23). Another study regarding barriers to uptake and effective integration of PMTCT into SRH services in selected

health facilities in Kenya, reported lack of knowledge of study participants regarding PMTCT services and lack of skills of Health care providers to provide adherence counseling (46). In another study looking at Knowledge, perception about antiretroviral therapy (ART) and PMTCT and adherence to ART among HIV positive women in Ghana, reported that more than 90% of the HIV positive women had inadequate knowledge about ART and PMTCT and these women were more likely to default ART (OR = 3.5; 95% CI = 1.89, 6.21)(36).

Norms and beliefs in the society that made HIV+ pregnant and lactating mothers not attending PMTCT services was assessed. The assumption was there are norms and beliefs that affect pregnant and lactating mothers' attendance into PMTCT services. Participants were asked to what extent the existing norms or beliefs in their community restricted them from not attending PMTCT services. All the study participants responded to the question and the results showed that, most of respondents (86.9%) and (60.5%) of those who have never missed and those who missed a visit are not affected by the norms and beliefs in their society. Similarly, religious belief was found not at all affecting attendance into PMTCT services in 88.6% and 71.2% of respondents who have never missed and those ever missed respectively. Stigma and discrimination is another factor assessed under norms and beliefs, however more than 50% of them from both groups reported to be not at all affected. There is a good number of them who are very much affected their attendance from the two groups representing 35% of all study participants. Such results are suggesting that, if someone misses services are not due to myths or cultural norms in the community. The results are different from those ofone study in 2014 which reported that there were some myths that, ARVs makes HIV+ mothers to regain their health and therefore increase rate of promiscuity. This triggered negative attitude to their partners prohibiting them from attending services to avoid infidelity (46)

Other factors like denial of HIV infection results, opposition from male partners, women's fear of disclosure of HIV status to their partners or other relatives as they may be found out if taking drugs has been documented to contribute towards attrition from PMTCT services(37)(38).

In this study 80.6% of all study participants had disclosed their HIV status to their partners and 76.5% disclosed to the community. Eighty two percent of those who never missed attendance reported to have support from their partners, as compared to 39.7% of those who missed visits. A follow up question was asked about their views regarding disclosing HIV status to the community if will support them in attending services every visit. Eighty seven percent of those who never missed a visit and 36.6% of those who missed strongly believe that disclosing status will enable the community around them to support them to attend services as required. The lack of support from partners in attending PMTCT services have been documented by a studyin Kenya as barrier to seeking PMTCT services especially in the health facilities where PMTCT services are not integrated (65.3%) as compared to 35.9% among women in integrated facilities. Expected support from partners in assisting pregnant and lactating mothers to attend and adhere to PMTCT services include escorting their partners to the clinic, contribute to transport fares and moral support in adherence to drugs at home. Stigma was not among the factors that showed statistical significance in affecting attendance in this study(46). However in a another studyreligious/ritual obstacles, stigma and discrimination, and side-effects were the most-frequently reported factors(29)

This study looked at the economic factors to see if they contribute to missing appointments inPMTCT option B+ services. Factors considered were wealth status of an individual, transportation fare, time spent at the clinic, and distance to health facility. The assumption was the studied economic factors affect the attendance of clients into PMTCT services. The results showed that, almost half (49.5%) of the study participants reported to be affected very much by the transport fare. In a qualitative study with 45 participants in Uganda using thematic analysis it was found that, of the economic constraints barriers, costly transport in order to attend monthly check ups was the greatest barrier to treatment in PMTCT program(39). It is obvious that poverty limits the ability to access healthcare especially when transport costs are considerable. This is a good example of a barrier where demand and supply meet. The cost of reaching the clinic is an issue for poor households to some communities although in our study this was not the case. Such problem can be addressed by providing cash or vouchers (on the demand side) or by bringing services closer to those in need (on the supply side). It is

important to note that it may not always be possible to bring specialized services to community or district level and there will always be a need of referral up the system.

Distance to the health facility was documented as less than 5 Kilometer and more than 5 kilometers. It was found that 82.2% of those who had missed clinics were living more than 5 Kilometers. This means that living far away from where PMTCT services predict one is likely to miss a visit. The difference between the two groups is highly statistically significant (P =0.000).

Further analysis was performed looking at type of transport used between the two groups. It was found that; participants who had never missed a visit travel by bus in 52.1%, bicycle in 20.3% and 27.6 walk by foot to the clinic. On the other hand only 6.8% of those who missed clinic had to walk by foot, 27.4% use bicycle and therefore 65.8% had to board a bus to attend PMTCT clinic. When the participants were asked about who is responsible for paying their transport fare when coming for PMTCT services, 67.1% of those who ever missed clinic reported to solicit funds for themselves to support their transport fees to clinic as compared to 56.9% of those who had never missed clinic. Similar findings reported in South Africa (40)

Regarding time spent at the clinic waiting services, the average time reported to be used at clinic was 4 hours ranging from 2 to 6. Most of those who never missed visits (67.5%) reported not at all affected by the time factor. On the contrary 89.1% of those who have ever missed clinic reported to be very much affected by the time spent while waiting for services. Health care providers need to take into consideration average time to serve clients timely to avoid inconveniences for clients

Institutional factors like privacy, confidentiality, adequacy of PMTCT services, andsatisfaction of the services given at the clinic were assessed. All the 196 study participants responded to the questions asked about what are their views on the factors under study. Most of the respondents in both groups reported there is adequate privacy (84.7%) and confidentiality (87.5%). They were also asked about services provided in the PMTCT room if were satisfactory and 81.6% of all respondents agreed that they were satisfactory. This is a very good strength to the health care providers and the facility at large to continue and improve service delivery provision. This could be a reflection of well trained staff in the PMTCT room where by on job mentorships from

regional and district managers conduct every quarter.Further analysis showed that those who did not experience privacy during provision of PMTCT services were (AOR=3.582, 95% CI=1.59-8.06) more likely to miss PMTCT clinics as compared to those who experienced enough privacy when receiving PMTCT services. Those who were not satisfied with PMTCT services were (AOR=8.8, 95% CI= 3.07-25.61)more likely to miss PMTCT clinics as compared to those who were satisfied with PMTCT services. Moreover, spending much time in the clinic significantly influenced missing clinic attendances as women who spent more than one hour in the clinic were (AOR=1.8, 95%CI=1.37-8.23) more likely to miss clinics as compared to those who spent less than one hour in the clinic. Similar results were observed in other studies(41) and (42). On the other hand, 72.6% of those who ever missed a visit reported that the health facility environment/structure hinder their attendance for PMTCT services. Other studies have reported systemic barriers which included poor health care worker attitudes, poor quality of counseling and information, shortage of skilled health staff, and poor referral links(43). There are other studies which reported confidentiality breaches (44) and sub-optimal layout of clinics contributed to lack of privacy (45). Since this was not observed in our setting it does not mean that it is not there, since there were few participants who reported very much affected by privacy and confidentiality therefore strengthening of the system on issues of confidentiality should continue so that we do not give a chance to distort the current status

STUDY LIMITATIONS

This study could not involve those clients who are lost to followup, these are the clients who have missed clinic for more than 90 days in spite of all means of tracking them back to care.

CONCLUSIONS

Social cultural factorslike age being divorced/separated, educational level of secondary school and above, Norms and beliefs including religious beliefs were associated with likelihood of missing clinic. On the other hand,economic factors studied with the exception of lack of road accessibility throughout the year were not associated with

missing clinic. Lack of privacy, confidentiality and satisfaction to the services provided by the HCPs were associated with likely hood of missing clinic

RECOMMENDATIONS

More strategies and sustainability measures for improving attendance into PMTCT services in Njombe Town Council need to be revised and improved

Clients when travelling to other places should be allowed and encouraged to collect ARVs from other clinics close and give a report back to their enrolled clinic. This should go in hand with establishing more PMTCT clinics in Njombe T.C especially in the distant areas.

Every client should have a treatment supporter who can pick medicine from clinic for her when she is very sick at home and who can be contacted when the client is not reachable.

Home based care services should be strengthened so as to take of those who are missing clinics because of sickness or any other reason.

There is a need to strengthen provision of services through continuous health education, counseling to clients, health care provider adhering to medical ethics by providing adequate and satisfactory care and abide to privacy and confidentiality.

More PMTCT centers should be established so that clients do not face the barrier of long distance travelling to the clinics.

REFERENCES

1. WHO. World Health Organization. HIV/AIDS - WHO Fact sheet. Vol. 360, WHO website. 2015.

2. Unaids. GLOBAL REPORT: UNAIDS report on the global AIDS epidemic 2013 [Internet]. Unaids. 2013. 198 p. Available from: www.unaids.org/.../unaids/.../2013/gr2013/UNAIDS_Global_Report_2013

3. WHO, UNICEF, UNAIDS. Global HIV/AIDS Response Progress Report 2011 [Internet]. Vasa. 2011.

4. WHO. WHO Global Tuberculosis Report 2014. WHO Rep. 2014;2013–4.

5. TACAIDS, NBS. Tanzania HIV/AIDS and Malaria Indicator Survey 2011–12. THMIS Rep [Internet]. 2013;103–10.

6. Unaids. Countdown to zero: GLOBAL PLAN TOWARDS THE ELIMINATION OF NEW HIV INFECTIONS AMONG CHILDREN BY 2015 AND KEEPING THEIR MOTHERS ALIVE [Internet]. UNAIDS. 2011.

7. UNAIDS W. UNAIDS report on the global AIDS epidemic [Internet]. … Programme on HIV/AIDS (UNAIDS) and World Health …. 2012.

8. Padian NS, McCoy SI, Karim SSA, Hasen N, Kim J, Bartos M, et al. HIV prevention transformed: The new prevention research agenda. Lancet [Internet]. 2011;378(9787):269–78.

9. Ciaranello AL, Perez F, Maruva M, Chu J, Engelsmann B, Keatinge J, et al. WHO 2010 guidelines for prevention of mother-to-child HIV transmission in Zimbabwe: modeling clinical outcomes in infants and mothers.

10. World Health Organization, Who WHO. World Health Statistics 2012. Vol. 27, World Health Statistics 2012. 2012. 171 p.

11. UNICEF. UNICEF [Internet]. UN Convention. 2013. p. 1–209. Available from: http://www.unicef.org.uk/Documents/Publication-pdfs/UNCRC_summary.pdf

12. Weiss SM, Peltzer K, Villar-Loubet O, Shikwane ME, Cook R, Jones DL. Improving PMTCT uptake in rural South Africa. J Int Assoc Provid AIDS Care. 2014;13(3).

13. Arrive E, Marquis B, Tumwesigye N, Fassinou P, Cotton M, Wemin L, et al. Response to Anti-Retroviral Therapy (ART) in children in sub-Saharan Africa: a pooled analysis of clinical databases: the KIDS-ART-LINC Collaboration.

14. Iwelunmor J, Ezeanolue EE, Airhihenbuwa CO, Obiefune MC, Ezeanolue CO, Ogedegbe GG. Socio-cultural factors influencing the prevention of mother-to-child transmission of HIV in Nigeria: a synthesis of the literature. BMC Public Health [Internet]. 2014;14(1):771.

15. UNAIDS. Countdown to zero: Global plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive, 2011-2015. UNAIDS. 2011. 48 p.

16. Geldsetzer P, Yapa HMN, Vaikath M, Ogbuoji O, Fox MP, Essajee SM, et al. A systematic review of interventions to improve postpartum retention of women in PMTCT and ART care. Vol. 19, Journal of the International AIDS Society. 2016.

17. Geng EH, Glidden D V., Bwana MB, Musinguzi N, Emenyonu N, Muyindike W, et al. Retention in care and connection to care among HIV-infected patients on antiretroviral therapy in Africa: Estimation via a Sampling-Based approach.

18. Ferguson L, Lewis J, Grant AD, Watson-Jones D, Vusha S, Ong'ech JO, et al. Patient attrition between diagnosis with HIV in pregnancy-related services and long-term HIV care and treatment services in Kenya: a retrospective study. J Acquir Immune Defic Syndr [Internet]. 2012;60(3):e90-7. 7

19. Tenthani L, Haas A, Tweya H. Retention in care under universal antiretroviral therapy for HIV-infected pregnant and breastfeeding women ('Option B+') in Malawi. AIDS [Internet]. 2014;28(4):589–98.

20. Moth I, Ayayo A, Kaseje D. Assessment of utilisation of PMTCT services at Nyanza Provincial Hospital, Kenya. SAHARA-J J Soc Asp HIV/AIDS. 2005;2(2):244–50.

21. Ngarina M, Popenoe R, Kilewo C, Biberfeld G, Ekstrom AM. Reasons for poor adherence to antiretroviral therapy postnatally in HIV-1 infected women treated for their own health: experiences from the Mitra Plus study in Tanzania. BMC Public Health [Internet]. 2013;13(1):450.

22. Tomori C, Kennedy CE, Brahmbhatt H, Wagman J a, Mbwambo JK, Likindikoki S, et al. Barriers and facilitators of retention in HIV care and treatment services in Iringa, Tanzania: the importance of socioeconomic and sociocultural factors. AIDS Care. 2014;26(7):907–13.

23. Harms G. Mother-to-child transmission of HIV and its prevention: Awareness and knowledge in Uganda and Tanzania. SAHARA J J Soc Asp HIV / AIDS [Internet]. 2005;2(2):9.

24. Boateng D, Kwapong GD, Agyei-Baffour P. Knowledge, perception about antiretroviral therapy (ART) and prevention of mother-to-child-transmission (PMTCT) and adherence to ART among HIV positive women in the Ashanti Region, Ghana: a cross-sectional study. BMC Womens Health [Internet]. 2013;13(1):2–8.

25. UNAIDS. UNAIDS Action plan on intensifying HIV prevention. available at http://data.unaids.org/pub/Report/2007/jc1218_preventionactionplan_en.pdf. 2006;

26. Sanjobo N, Frich JC, Fretheim A. Barriers and facilitators to patients' adherence

to antiretroviral treatment in Zambia: a qualitative study. SAHARA J [Internet]. 2008;5(3):136–43.

27. Gourlay A, Wringe A, Birdthistle I, Mshana G, Michael D, Urassa M. “It is like that, we didn’t understand each other”: Exploring the influence of patient-provider interactions on prevention of mother-to-child transmission of HIV service use in rural Tanzania. PLoS One. 2014;9(9).

28. Gourlay A, Wringe A, Todd J, Cawley C, Michael D, Machemba R, et al. Factors associated with uptake of services to prevent mother-to-child transmission of HIV in a community cohort in rural Tanzania. Sex Transm Infect [Internet]. 2015;91(7):520–7.

29. Wasti SP, Simkhada P, Randall J, Freeman J V., Van Teijlingen E. Barriers to and facilitators of antiretroviral therapy adherence in Nepal: A qualitative study. J Heal Popul Nutr. 2012;30(4):410–9.

30. TDHS. Tanzania Demographic and Health Survey. National Bureau of Statistics Dar es Salaam, Tanzania ICF Macro Calverton, Maryland, USA. 2010.

31. Judy Robertson. Likert-type scales, statistical methods, and effect sizes. Commun ACM. 2012;5(1):6–7.

32. Rubin H, Rubin I. Rubin, Rubin (2005) Design.pdf. In: The Art of Hearing Data. 2005. p. 39–63.

34. Kirsten I, Sewangi J, Kunz A, Dugange F, Ziske J, Jordan-Harder B, et al. Adherence to combination prophylaxis for prevention of mother-to-child-transmission of HIV in Tanzania. PLoS One. 2011;6(6).

35. Olugbenga-Bello AI, Adebimpe WO, Osundina FF, Abdulsalam ST. Perception on prevention of mother-to-child-transmission (PMTCT) of HIV among women

of reproductive age group in Osogbo, Southwestern Nigeria. Int J Womens Health. 2013;5(1):399–405.

36. Boateng D, Kwapong GD, Agyei-Baffour P. Knowledge, perception about antiretroviral therapy (ART) and prevention of mother-to-child-transmission (PMTCT) and adherence to ART among HIV positive women in the Ashanti Region, Ghana: a cross-sectional study. BMC Womens Health [Internet]. 2013;13(1):2.

37. Kenya National Bureau of Statistics (KNBS); ORC Macro. Kenya Demographic and Health Survey 2008-09. Heal (San Fr. 2010;1–314.

38. Spangler SA, Onono M, Bukusi EA, Cohen CR, Turan JM. HIV-positive status disclosure and use of essential PMTCT and maternal health services in rural Kenya. J Acquir Immune Defic Syndr [Internet]. 2014;67 Suppl 4:S235-42.

39. Duff P. HIV infection in women. Prim Care Update Ob Gyns. 1996;3(2):45–9.

40. Skinner D, Mfecane S, Gumede T, Henda N, Davids A. Barriers to accessing PMTCT services in a rural area of South Africa. Afr J AIDS Res. 2005;4(2):115–23.

41. Lyatuu MB, Msamanga GI, Kalinga a K. Clients' satisfaction with services for prevention of mother-to-child transmission of HIV in Dodoma Rural district. East Afr J Public Health. 2008;5(3):174–9.

42. Hardon A, Vernooij E, Bongololo-Mbera G, Cherutich P, Desclaux A, Kyaddondo D, et al. Women's views on consent, counseling and confidentiality in PMTCT: a mixed-methods study in four African countries. BMC Public Health. 2012;12(1):26.

43. (UNICEF) UNCF. Opportunity in Crisis. Preventing HIV from early adolescence

to young adult. Intern Audit [Internet]. 2009;65(3):7. Available from: http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=41566003&site=ehost-live

44. Varga C, Brookes H. Factors influencing teen mothers' enrollment and participation in prevention of mother-to-child HIV transmission services in Limpopo Province, South Africa. Qual Health Res. 2008;18:786–802.

45. Muchedzi A, Chandisarewa W, Keatinge J, Stranix-Chibanda L, Woelk G, Mbizvo E, et al. Factors associated with access to HIV care and treatment in a prevention of mother to child transmission programme in urban Zimbabwe. J Int AIDS Soc [Internet]. 2010;13(1):38.

APPENDICES

Appendix 1: Consent form

Introduction

Dear Madam,

My name is Dr. Moris Philip Mwanyika, a masters student from Muhimbili University of Health and Allied Sciences (MUHAS). I am conducting a study on **FACTORS ASSOCIATED WITH MISSING APPOINTMENTS IN THE PREVENTION OF MOTHER TO CHILD TRANSMISSION OF HIV (OPTION B+) PROGRAM IN NJOMBE TOWN COUNCIL**

Participation in the study

I kindly request you to participate in my research, as one of the participants your opinions are very important to this study. I assure you that all answers given will remain confidential and will only be used for the purpose of this study.

Risk of participating in the study

There is no anticipated harm that may result from participating in this study. Your participation is absolutely voluntary and there is no penalty for refusing to participate. You are free to ask question and you may stop to participate in this study at any time.

Contact person

Principal investigator, Dr.Moris Philip Mwanyika (0713566051) is a key contact person with regard to any queries about this study.

Any questions about your rights as participants can also be channeled to Prof. **Aboud**, the chairman of university senate, research and publications, MUHAS P.O Box 65001, Dar es Salaam , Tel: +25522150302-6

Thanking you in advance for your co operation

Dr. Moris Philip Mwanyika Signature----------

Signing consent

I have understood the explanation of the study. I agree to participate in the study as explained by the researcher.

Signature of participant.....Signature of witness.....

Appendix II: Consent form (Swahili version)
FOMU YA RIDHAA KUSHIRIKI KATIKA UTAFITI YA KISWAHILI

Utangulizi

Mimi naitwa Dkt. Moris Philip Mwanyika, mtafiti kutoka Chuo Kikuu cha Sayansi ya Tiba Muhimbili. Ninafanya utafiti kuhusu **‘ Sababu zinazohusiana na kukosa kuhudhuria kliniki katika huduma za kuzuia maambukizi ya virusi vya ukimwi kutoka kwa mama kwenda kwa mtoto kwa wanawake wajawazito na wanaonyonyesha katika halmashauri ya mji wa Njombe**

Kushiriki katika utafiti huu
Tafadhali unaombwa kushiriki katika utafiti huu, na mara tu utakapo ridhia ,unahakikishiwa kuwa habari zako na maelezo utakayotoa yatatumika kwa makusudio na malengo ya utafiti huu tu na kuwa hii haitakuletea usumbufu wowote.

Usiri wa taarifa za mshiriki
Unahakikishiwa tena kuwa taarifa zozote zitakazopatikana kutoka kwako wakati wa utafiti huu zitapewa usiri mkubwa sana na hazitatumika kwa malengo mengine yeyote tofauti na utafiti husika. Kuhakikisha hilo dodoso litakalo husika halitakuwa na jina lako wakati wote wa utafiti na hata baada ya utafiti.

Athari za utafiti huu kwa mshiriki
Hakuna athari au madhara yeyote yatakayokupata kutokana na kushiriki katika utafiti huu.

Haki ya kushiriki au kutoshiriki katika utafiti huu
Ushiriki wako katika utafiti huu ni wa hiari kabisa.unayohaki ya kushiriki au kutoshiriki bila kulazimika. Pia unayo haki ya kukataa kuendelea kushiriki/kuacha kujibu maswali

wakati wowote utakapojisikia kufanya hivyo na hakutakuwa na hatua yeyote itakayochukuliwa dhidi yako au kulaumiwa kwa kufanya hivyo.

Mawasiliano

Wasiliana na mtafiti mkuu, Dkt.Moris Philip Mwanyika, kwa simu namba 0713566051 wakati wowote utakapokuwa na maswali au jambo lolote lenye kuhitaji ufafanuzi kuhusu utafiti huu.Hata hivyo endapo utakuwa na maswali kuhusu haki yako kama mshiriki unaweza pia kuwasiliana na Prof. Aboud, Mwenyekiti wa Baraza la Utafiti na Uchapishaji wa Chuo Kikuu cha Sayansi ya Tiba Muhimbili. S.L.P. 65001, Dar es Salaam.Simu namba 2150302-6

Kukubali kushiriki

Ukikubali kushiriki tafadhali thibitisha kwa kujaza na kusaini sehemu ya fomu hii hapa chini.

Mimi …….nimesomewa na kuelewa yaliyomo kwenye form hii na maswali yangu yote yamejibiwa vizuri.Hivyo ninakubali mwenyewe kwa hiari yangu bila kushurutishwa au kushawishiwa kushiriki katika utafiti huu.

Sahihi ya mhojiwa…….....

Tarehe…….....……..

Sahihi ya mhoji. ……Tarehe ……

Appendix III: Questionnaire

Date of interview…….Facility type.....Facility Name ….....

Questionnaire No……..

PART A PERSONAL DETAILS

A1. AGE in years_____

A2. Level of Education

a. No formal school
b. Primary
c. Form iv
d. Form vi
e. College/University
f. School dropout , Level……..

A3. What is your marital status?

a. Single
b. Married
c. Divorced/separated

A4. Pregnancy / lactation status

a. Pregnant
b. Lactating

A5. What is your occupation?

a. Public/private employee

b. A business person

c. Self-employed /peasant

d. House wife

A6. How many children are living in your house hold _____

A7. When were you initiated on ARVs

a. Before the index pregnancy
b. During the index pregnancy
c. During index lactation

A8. For how long you have been using ARVs_____

A9.Have you been attending PMTC services all the time as scheduled?

a) If yes what reasons/factors make you attend PMTCT services all the time?
b) If no i) how many times have you missed your appointment?

ii) What reasons made you miss your appointment?

A10. Have you disclosed your HIV status to your spouse/partner? Yes ____No _____

If no give reasons

A11. If yes to what extent your spouse/partner gives you cooperation to attend PMTCT services as scheduled?

a. Not at all
b. Very little
c. Little
d. Much
e. Very much

A.12.Have you disclosed your HIV status to your family/community? Yes-------- No-----

If not disclosed status to anyone give reasons

A.13.If yes to what extent does your family support you to attend PMTCT services?

a. Not at all
b. Very little
c. Little

d. Much
e. Very much

PART B SOCIOCULTURAL FACTORS

B1. **Perception and attitude**

B1.1 To what extent do you benefit from your participation into PMTCT at this clinic?

a. Not at all
b. Very little
c. Little
d. Much
e. Very much

B1.2. All Pregnant and lactating women should be screened for HIV at RCH as part of routine services

a. Strongly agree
b. Agree
c. Disagree
d. Strongly disagree

B1.3. All pregnant and lactating women who are found to be HIV+ should use antiretroviral drugs for life

a. Strongly agree
b. Agree
c. Disagree
d. Strongly disagree

B1.4. HIV infected pregnant women must be delivered with skilled personnel at a health facility

a. Strongly agree

b. Agree

c. Disagree

d. Strongly disagree

B1.5. Disclosing your HIV status results to your spouse will give him an opportunity to provide more support to you in receiving PMTCT services

a. Strongly agree
b. Agree
c. Disagree
d. Strongly disagree

B2.Knowledge and awareness of PMTCT services

B2.1. What are the modes of HIV transmission that you know

a. Unprotected sex with an infected person Yes No
b. Blood transfusion with infected blood Yes No
c. Sharing of sharp objects Yes No
d. Casual contact such as hugging, handshakes, etc. Yes No
e. Insect bites like mosquitoes Yes No
f. Infected mother to child Yes No
g. Sleeping in same room with infected individual Yes No
h. Swimming pool and public toilet Yes No

B2.2. In which of the following period can HIV positive mother transmit AIDS virus to her child?

(a)During pregnancy Yes No
(b)During delivery Yes No
(c)During breastfeeding Yes No
(d) After cessation of breast feeding Yes No
If yes mention how

B2.3. The following is a way which may help to prevent mother to child transmission of HIV

(a) Taking ARVs for life even during pregnancy and lactation Yes No

(b) Provide ARV prophylaxis to children born to infected mothers at birth to 6weeks of life

Yes No

(c) Practice exclusive breastfeeding for the first six months of life Yes No

B3. **Norms and beliefs**

B 3.1. To what extent do the norms and beliefs in your society make HIV+ pregnant and lactating mothers not to be involved in PMTCT services?

a. Not at all
b. Very little
c. Little
d. Much
e. Very much

B 3.2.what are those norms and beliefs that affect your attendance to PMTCT services

_____

B 3.3. To what extent does your religious beliefs affect you from attending to the PMTCT services

a. Not at all
b. Very little
c. Little
d. Much
e. Very much

B3.4. To what extent does discrimination affects your attendance to PMTCT services

a. Not at all
b. Very little
c. Little
d. Much

e. Very much

PART C ECONOMIC FACTORS

C1. **Wealth**

C1.1 In your home is there	Yes	No
a) Electricity	☐	☐
b) Radio	☐	☐
c) Television	☐	☐
d) Bicycle	☐	☐
e) Refrigerator	☐	☐
f) Others mention		

C1.2 What is your principal source of drinking water?	Yes	No
a) Piped drinking water in the residence	☐	☐
b) Piped drinking water outside residence		
c) Rain water	☐	☐
d) River/ canal/surface	☐	☐
e) Other sources	☐	☐

C1.3 What is the principal type of toilet facility used by members of your family?	Yes	No
a) Septic Tank or Toilet	☐	☐
b) Pit latrine	☐	☐
c) Water sealed or slab latrine	☐	☐
d) Open latrine	☐	☐
e) Hanging Latrine	☐	☐

f) Bush field latrine

g) Other type of latrine ☐ ☐

C1.4 What is the type of floor in your house?	Yes	No
a) Earth or Bamboo	☐	☐
b) Wood or plunk	☐	☐
c) Cement	☐	☐
d) Other type of flooring	☐	☐

C1.5What is the principal wall material	Yes	No
a) Cane, palms trunks	☐	☐
b) Rudimentary walls	☐	☐
c) Tin/iron sheet	☐	☐
d) Concrete/Bricks	☐	☐
e) Other materials	☐	☐

C1.6What is the principle roofing material?	Yes	No
a) Natural roofing materials	☐	☐
b) Rudimentary roofing	☐	☐
c) Finished roof	☐	☐
d) Other roof	☐	☐

C2. **Transportation costs**

C2.1. To what extent does the transport fare affects your attendance to this clinic for PMTCT services

a. Not at all
b. Very little
c. Little
d. Much
e. Very much

C2.2. What is the cost of transport fare from where you live to this clinic_____

C2.3. Who is responsible for paying your transport fare when coming for PMTCT services

a. Myself
b. Husband/partner
c. Others (mention)_____

C3. Time spent at the clinic

C3.1. To what extent does time spent while awaiting services affects your attendance to PMTCT services?

a. Not at all
b. Very little
c. Little
d. Much
e. Very much

C3.2. What is the average time you spend at this clinic while waiting for PMTCT services?

D1. Distance to health facility

D1.1. To what extent does the distance from where you live to the facility where you receive PMTCT services affects your attendance as scheduled?

a. Not at all
b. Very little
c. Little
d. Much

D1.2. On average how many Kilometers (Km) do you travel to get to PMTCT services in this facility? _____

D1.3. What type of transport do you use attending PMTCT services in this facility

a. Walking
b. Bicycle
c. Motorcycle
d. Bus
e. Private transport

PART E: INSTITUTIONAL FACTORS

E1.1 Is there enough privacy in this health facility? YES……..

No…….

E1.2. To what extent lack of privacy at health affects your attendance?

a. Not at all
b. Very little
c. Little
d. Much
e. Very much

E1.3. Is there enough confidentiality in this health facility? YES……..

No…….

E1.4. To what extent lack of confidentiality in this facility affects your attendance to PMTCT services

a. Not at all
b. Very little
c. Little
d. Much
e. Very much

E1.5. Are PMTCT services provided in this facility satisfactory?

a. Strongly agree
b. Agree
c. Disagree
d. Strongly disagree

Swahili Version

Appendix IV Questionnaire - Swahili Version

SEHEMU A HABARI BINAFSI

Jibu maswali haya

A1 Umri kwa miaka _____

A 2 Kiwango cha elimu

b. Hajasoma shule yoyote
c. Elimu ya msingi
d. Hadi kidato cha nne
e. Kidato cha sita
f. Chuo/ chuo kikuu
g. Hakumaliza shule, kiwango alichoishia…….

A 3 Hali ya ndoa ?

a. Hajaolewa
b. Ameolewa
c. Ametalikiwa/Ametengana

A4 Hali yake

a. Mjamzito
b. Ananyonyesha

A 5 Shughuli anayofanya kujitengenezea kipato

a. Muajiriwa

b. Mfanyabiashara

c. Amejiajiri / mkulima mdogo

d. Mama wa nyumbani

A6 Watoto wangapi wanaishi katika nyumbayako _____

A7 Ni wakati gani ulianzishiwa dawa:

a. Kabla ya ujauzito huu
b. Wakati wa uja uzito huu, wiki ya_____
c. Wakati wa wa unyonyeshaji wa mtoto huyu

A8. Umetumia dawa za ARV kwa muda gani sasa _____

A.9 Je, umekua ukihudhuria kliniki ya kuzuia maambukizi ya kutoka kwa mama kwenda kwa mtoto mara zote kama ulivyopangiwa? Ndiyo _____ Hapana_____(weka tiki)

a) Kama ndiyo ni sababu gani zinakufanya uhudhurie kliniki mara zote bila kukosa?

b)Kama hapana; 1)Je ni mara ngapi hujahudhuria kliniki?

2)Sababu gani zilikufanya usihudhurie kliniki?

A10. Umeshamshirikisha mwenza wako hali yako ya maambukizi ya virusi vya ukimwi?

Ndiyo ____Hapana_____(weka tiki)

Kama hapana, toa sababu

A.11 Kama jibu ni ndiyo hapo juu ni kwa kiasi gani mwenza wako anakupa ushirikiano wa kuja kupata huduma ya kuzuia maambukizi kwenda kwa mtoto

a. Hanipi kabisa
b. Kidogo sana
c. Kidogo
d. Kikubwa
e. Kikubwa sana

A12 Umeshawashirikisha wanafamilia/wanajamii yako hali yako ya maambukizi ya virusi vya ukimwi?Ndiyo ____Hapana_____(weka tiki)

Kama hapana, Toa sababu

A13 Kama jibu ni ndiyo hapo juu, kwa kiasi gani familia/jamii yakoinakupa ushirikiano wa kuja kupata huduma ya kuzuia maambukizi kwenda kwa mtoto

a. Hanipi kabisa
b. Kidogo sana
c. Kidogo
d. Kikubwa
e. Kikubwa sana

SEHEMU B TAARIFA ZA KIJAMII

B1 **Mtazamo**

B1.1 Kwa kiasi gani unafaidika na huduma hii ya kuzuia maambukizi kutoka kwa mama kwenda kwa mtoto?

a. Sifaidiki kabisa
b. Nafaidika kidogo sana
c. Nafaidika kidogo
d. Nafaidika sana

B1.2 Wanawake wote wajawazito au wanaonyonyesha wanatakiwa kupima VVU wanapokuja kliniki kama sehemu ya huduma ya kawaida

a. Sikubaliani kabisa
b. Nakubaliana
c. Sikubaliani
d. Sikubaliani kabisa

B1.3 Wanawake wajawazito au wanaonyonyesha wenye maambukizi ya VVU wanatakiwa kuanzishiwa dawa za kupunguza makali ya VVU na kuendelea nazo maisha yao yote

a. Nakubaliani kabisa
b. Nakubaliana
c. Sikubaliani
d. Sikubaliani kabisa

B1.4 Mjamzito anaeishi na VVU anapohitaji kujifungua asaidiwe na mhudumu wa afya mwenye ujuzi kwenye kituo cha afya

a. Nakubaliana kabisa
b. Nakubaliana
c. Sikubaliani
d. Sikubaliani kabisa

B1.5 Kumshirikisha mwenza wako majibu ya VVU kutampa nafasi ya kukupa ushirikiano mzuri zaidi kupata huduma ya kuzuia maambukizi kwenda kwa mtoto

a. Nakubaliani kabisa
b. Nakubaliana
c. Sikubaliani
d. Sikubaliani kabisa

B 2.**Uelewa kuhusu kuzuia maambukizi kutoka kwa mama kwenda kwa mtoto**

B2.1 Njia zipi zinazoleta maambukizi ya VVU unazozifahamu (Jibu HAPANA au NDIYO)

a. Kufanya ngono zembe na mtu mwenye maambukizi ya VVU
b. Kuongezewa damu ya mtu mwenye maambukizi ya VVU
c. Kuchangia vitu vyenye ncha kali
d. Kugusana kawaida kama kukumbati, kushika mikono, kuchangia taulo, na kijiko
e. Kung'atwa na wadudu kama mbu
f. Kutoka kwa mama mwenye maambukizi kwenda kwa mtoto
g. Kulala chumbakimoja na mwenye maambukizi
h. Kuogelea na kuchangia choo

B2.2 Ni katika kipindi gani hasa mama mwenye maambukizi ya VVU anaweza kumuambukiza mtoto? (Jibu ndiyo au hapana)

a. Wakati wa ujauzito
b. Wakati wa kujifungua
c. Wakati wa kunyonyesha
d. Baada ya kumwachisha kunyonya, Kama ndiyo taja namna gani

B 2.3 Zifuatazo ni njia ambazo zinaweza kuzuia maambukizi ya VVU kutoka kwa mama kwenda kwa motto (Jibu ndiyo au hapana)

a. Kutumia dawa za kupunguza makali wakati wa ujauzito na kunyonyesha
b. Kumpa mtoto dawa ya kuzuia maambukizi anapozaliwa hadi wiki 6
c. Kunyonyesha maziwa ya mama pekee kwa miezi sita ya mwanzo

B3 **Miiko na imani**

B 3.1 Kwa kiasi gani miiko na imani katika jamii yenu inawanyima wamama wasijihusishe na huduma ya kuzuia maambukizi kutoka kwa mama kwenda kwa mtoto

a. Hakuna kabisa
b. Kiasi kidogo sana
c. Kidogo
d. Kikubwa
e. Kiasi kikubwa sana

B 3.2 Ni miiko na imani zipi zinaathiri mahudhurio yako ktk huduma za kuzuia maambukizi kwa mtoto----------

3.3 Ni kwa kiasi gani Imani ya dini uliyonayo inaathiri uhudhuriaji wako kwenye kupata huduma ya kuzuia maambukizi kutoka kwamama kwenda kwa

a. Hauathiri kabisa
b. Kidogo sana
c. Kidogo
d. Kikubwa
e. Kikubwa sana

B 3.4 Ni kwa kiasi gani unyanyapaa una kuathiri wewe katika kuhudhuria kliniki kupata huduma ya kuzuia maambukizi ya VVU kutoka kwa mama kwenda kwa mtoto

a. Hauathiri kabisa
b. Kidogo sana
c. Kidogo
d. Kikubwa
e. Kikubwa sana

SEHEMU C UCHUMI

C1 **UTAJIRI**

C1.1 Katika nyumba yako kuna kipi kati ya hivi vifuatavyo?

a. Umeme
b. Radio
c. Runinga
d. Baiskeli
e. Samani nyinginezo ,taja

C1.2 Nini chanzo chako kikuu cha maji ya kunywa ?

	Ndiyo	Hapana
a. Maji ya bomba ndani ya makazi	☐	☐
b. Maji ya bomba nje ya makazi	☐	☐
c. Maji ya mvua	☐	☐
d. Mto au mfereji	☐	☐
e. Mengineyo, taja		

C1.3 Mnatumia choo cha aina gani katika makazi yako?

	Ndiyo	Hapana
a. Septic Tank or Toilet	☐	☐
b. Choo cha shimo	☐	☐
c. Choo cha maji	☐	☐
d. Choo cha wazi	☐	☐
e. Choo cha mning’inio	☐	☐
f. kujisaidia porini	☐	☐
g. Aina nyinginezo, taja		

C1.4 Sakafu ya nyumba yako ni ya aina gani?

a. udongo ☐ ☐
b. mbao ☐ ☐
c. simenti ☐ ☐
d. Aina nyingine, taja

C1.5 Kuta za nyumba yako zimejengwa na nini? Ndiyo Hapana

a. Fito na udongo ☐ ☐
b. Kuta za kuegesha ☐ ☐
c. mabati ☐ ☐
d. Matofali ☐ ☐
e. Aina nyingine, taja

C1.6 Nyumba yako imeezekwa na nini? Ndiyo Hapana

a. Paa la kiasilia ☐ ☐
b. Paa la kuegesha ☐ ☐
c. Paa kamili (mbao,bati au vigae) ☐ ☐
d. Aina nyinginezo zitaje? ☐ ☐

C2 **Gharama za usafiri**

C2.1 Ni kwa kiasi gani gharama ya usafiri inakuathiri wewe kuja kupata huduma ya kuzuia maambukizi kutoka kwa mama kwenda kwa mtoto

a. Haziathiri kabisa
b. Kidogo sana
c. Kidogo
d. Kikubwa
e. Kikubwa sana

C2.2 Makadirio ya gharama unazotumia kutoka nyumbani na kurudi kuja kupata huduma hapa ni shilingi ngapi_____

C2.3 Ni nani anahusika kukugharamia nauli ya kuja kwenye hii huduma ya kuzuia maambukizi kutoka kwamama kwenda kwa mtoto

a. Mwenyewe

b. Mume/ mwenza
c. Wengine (wataje)_____

C3. Muda unaotumika kliniki

C3.1 Kwa kiasi gani muda unaotumia hapa kliniki ukisubiria huduma unakuathiri wewe kuendelea kuja kupata huduma ya kuzuia maambukizi

a. Hauathiri kabisa
b. Kidogo sana
c. Kidogo
d. Kiasi kikubwa
e. Kiasi kikubwa sana

C3.2 Kwa makadirio, unatumia muda gani hapa kliniki kuanzia unapofika mpaka unapoondoka ukiwa umeshapata huduma_____

PART D JIOGRAFIA YA MAHALI

D1 Distance to health facility

D1.1 Kwa kiasi gani umbali wa sehemu unayoishi na hapa kliniki unachangia wewe kupata ugumu wa hudhuria kwenye huduma ya kuzuia maambukizi kama ulivyopangiwa na watoa huduma

a. Hauchangii kabisa
b. Kidogo sana
c. Kidogo
d. Kikubwa
e. Kikubwa sana

D1.2 Kwa makadirio ni umali wa kilometa ngapi unasafiri kuja kupata huduma kwenye hiki kituo _____

D1.3 Unatumia usafiri wa aina gani kwenda kupata huduma?

a. Kutembea kwa miguu
b. Baiskeli
c. pikipiki
d. Basi
e. Usafiri wa gari binafsi

D1.4 Barabara unayotumia inapitika vipindi vyote vya mwaka?

ndiyo _____ hapana_____

SEHEMU E KITUONI /TAASISI

E1.1 Je kuna faragha ya kutosha katika kituo hiki? Ndiyo_____ Hapana _____(weka tiki)

Kama ndiyo nenda E1.2 Kama hapana nenda E1.3

E1.2 Ni kwa kiasi gani kutokuwepo kwa faragha ya kutosha katika kutoa huduma hii kunachangia wewe kupata ugumu wa kuendelea kuja kupata huduma

a. Hakuchangii kabisa
b. Kunachangia kidogo sana
c. Kunachangia kwa kiasi kidogo
d. Kunachangia kwa kiasi kikubwa
e. Kunachangia kwa kiasi kikubwa sana

E1.3 Je huduma zinatolewa kwa usiri wa kutosha katika kituo hiki? Ndiyo___ Hapana _____

E1.4 Ni kwa kiasi gani kutokuwapo na usiri katika kutoa huduma hii kunachangia wewe kupata ugumu wa kuendelea kuja kupata huduma?

a. Hakuchangii kabisa
b. Kunachangia kidogo sana
c. Kunachangia kwa kiasi kidogo
d. Kunachangia kwa kiasi kikubwa

E1.5 Huduma za kuzuia maambukizi zinazitolewa kwenye kituo hiki ni za kuridhisha

a. Nakubaliana kabisa
b. Nakubaliana kidogo
c. Sikubaliani

d. Sikubaliani kabisa

Appendix V. Manuscript

Factors associated with missing appointments in the prevention of mother to child transmission of HIV (Option B+) program in Njombe Town Council

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ABSTRACT

Background: Tanzania has adopted the World Health Organization recommendation of initiating lifelong anti-retroviral treatment to all pregnant and lactating mothers infected with human immunodeficiency virus (HIV) regardless of disease immunological or clinical stage with the aim to eliminate mother to child transmission (eMTC) of HIV. Challenges in consistently attending care and treatment services as scheduled have been reported, this study seek to find out whether such factors also affect PMTCT option B+ program.

Objective: To determine factors associated with missing appointments in prevention of mother to child transmission of HIV (Option B+) program in Njombe town Council

Methods: Descriptive cross-sectional study with a sample size of 196 participants. Interviewed responses were analyzed using SPSS version 20.0. Chi square was

performed to determine the association between the independent variables and the dependent variable. Odds ratios were calculated to assess the likelihood of some factors that were found significant.

Results: A total number of 196 participants were interviewed of which 37% reported to have been missing clinic since ART initiation. Age group above 35 years had increased risk of missing appointments in the PMTCT clinics (AOR=1.7, 95%CI=0.51-6.07). However, this age group has no statistical significance since 95% CI includes one. Divorced women (AOR=12.2, 95% CI=1.77-85.8), education level secondary school and above (AOR=12.2 95% CI=1.77-83.8), norms and beliefs (AOR=4.1, 95% CI=1.71-9.92), religious beliefs (AOR=4.4, 95% CI= 1.25-15.67), those with little community cooperation (AOR=9.9, 95%CI=1.68-59.0) were more likely to miss PMTCT clinics. Economic factors studied with the exception of lack of road accessibility throughout the year were not associated with missing clinic. Those who experienced lack of privacy (AOR=3.582, 95% CI=1.59-8.06), dissatisfaction (AOR=8.8, 95% CI= 3.07-25.61), spending much time at clinic (AOR=1.8, 95%CI=1.37-8.23) were more likely to miss clinic appointments.

Conclusion: More strategies and sustainability measures for improving attendance into PMTCT services in Njombe Town Council like tracking system using home based care services, community health worker for maximum impact in tracing clients' early need to be revised and improved.

NTRODUCTION

The HIV epidemic remains a major public health challenge worldwide, with devastating effects in sub-Saharan Africa. Worldwide approximately 36.9 (32.2–38.8) million people were living with HIV by 2014 and women represented half (50%) of all adult people living with HIV globally [1].HIV infected women can transmit the infection to their infants through mother-to-child transmission (MTCT). In 2013, an estimated 1.5 million pregnant women were living with HIV globally leading to more than 1,100 children younger than 15 years becoming infected with HIV every day [2].

In Sub Saharan Africa, an estimated 24.7 (23.5–26.1) million people are living with HIV which contributes to nearly 71% of the world HIV burden. HIV infected pregnant women contribute to transmission to children below 14years by more than 90%. [3] There were 3.2 million children living with HIV in 2013; 240,000 new infections among children, and 190,000 AIDS deaths [4]. Tanzania is equally affected, despite the recent slight declining trend in HIV prevalence in the age group 15–49 years from 6.5% to 5.7% and 5.1% in 2004, 2007, and 2011, respectively[5].

In the absence of any interventions, the MTCT rate ranges from 15-45%, this can be reduced to below 5% with effective interventions [4]. In high-income countries, the MTCT rate is less than 1% this is because of perinatal PMTCT interventions.

The Government of Tanzania joined the global plan to have an AIDS-free generation by eliminating new HIV infections among children and keeping their mothers alive through implementation of more effective strategy in PMTCT services. This strategy aims at reducing the number of new HIV infections in children by 90%, retain those initiated on ARV into care by 90% and reducing HIV related maternal deaths by 50% as per PMTCT plan 2012-2015 [6,7]. From 2000 to 2013 there has been a progressive increase in the use of ARVs in PMTCT such as initiating single dose Nevirapine (sdNVP) in 2004, to short course ARV prophylaxis in 2010 to a stratified approach with Life Long ARVs for Pregnant and Lactating Mothers (LLAPLa) which is known as PMTCT Option B plus in 2013. This current strategy refers to initiating antiretroviral therapy (ART) to all pregnant and lactating mothers who are found to be infected by HIV regardless of their immunological status. PMTCT services provided in Tanzania include routine HIV testing and counseling, ARV treatment for mothers and prophylaxis for children, safer delivery practices, counseling and support for safer infant feeding practices, long-term follow-up care for mother and child and family planning[8] (25).

Njombe is the leading region in Tanzania with the highest prevalence of HIV (14.8%). Prevalence is higher among women (15.4%) than men (14.2%) [5]. PMTCT Option B+ services in Njombe started since October 2013. Njombe Town Council has 47 health facilities that provide PMTCT Option B+ services. PMTCT services are now included in

the reproductive and child health (RCH) services whereby every woman who comes for antenatal clinic (ANC) registration is also offered provider initiated testing and counselling(PITC) services and all those who are found to be HIV infected are registered into CTC 2 card and are initiated ARV.

Preventing children from HIV infection gives them an opportunity to grow normally as other children who are not exposed to HIV infection, reaching potential developmental milestones appropriate for the age. Therefore, it is important that after initiation of ARVs as part of PMTCT program women return to the clinic for clinical evaluation, monitoring of adverse effects and adherence to medications to improve both maternal and child outcome. Despite the benefits of PMTCT services, consistent attendance of pregnant and lactating mothers into the PMTCT program is highly variable. Maintaining clinic appointments result in good retention in care when attended visits are evaluated in a certain period. However, several barriers have been found to be associated with missing of appointments. Some of the barriers identified in the care and treatment center (CTC) include socio-cultural factors such as lack of community support, psychosocial barriers related to HIV stigma. It is not documented whether the same factors affects attendance into the PMTCT Option B+ program as well. This study seeks to determine the extent to which socio-cultural, economic and institutional factors play part in missing appointments of HIV positive pregnant and lactating mothers to PMTCT Option B+ services in Njombe Town Council.

In order to have maximum viral load suppression and to achieve the goal preventing mother to child transmission all pregnant women on ART must attend all the scheduled visits so that they do not miss their ART dose. Proper attendance of all scheduled visits makes these women to be retained to PMTCT services. Retention in HIV care refers to the engagement in comprehensive prevention, support, and care services regardless of site and therefore missing of appointments to PMTCT clinics among HIV-infected women has negative implications for clinical outcomes and may ultimately undermine the effectiveness of national treatment programs[3,9]. Further, WHO defines four stages of adherence to treatment in the continuum of HIV care and support as follows: 1- the moment from when one tests HIV positive to enrolment in care; 2-from enrolment in

care to ART eligibility assessment; 3-ART eligibility to ART initiation; and 4-continuation of treatment throughout life [4,10].

In option B+ program the moment from when one tests positive up to the moment of initiation is much shorter because the program applies the principle of test and treat where by all who test positive are directly enrolled and initiated ART. PMTCT clinic attendance is essential for monitoring disease progression, providing prophylactic drugs to reduce the risks of opportunistic infections, ensuring timely ART initiation, and optimizing long-term benefits of treatment. [9]

Missing clinic makes the HIV infected pregnant woman not to take her antiretroviral and her baby is unlikely to be initiated on the necessary prophylaxis after delivery, and may not be registered for regular follow-up in the PMTCT program. Hence this results in a delayed disease progress evaluation and initiation of life-saving ART. [11]

Tanzania like many other sub Saharan countries has moved towards national coverage of PMTCT services; however, most children born to women with HIV are not being systematically monitored and followed up during the postpartum period and are thus missing out the life-saving services. [9,12].

MATERIAL AND METHODS

Study setting

The study was conducted in Njombe Town Council, which is one of the 6 councils in Njombe. It was chosen as study area because Njombe region has highest prevalence HIV (14.8%) in Tanzania and Njombe town council (TC) has highest prevalence and the largest population as compared to other councils. There are 47 health facilities in Njombe TC that provide PMTCT Option B+ services. This study was conducted in 7 health facilities that is, 1 Hospital (Kibena regional Hospital), 4 health centers (Njombe Town, Anglican, Idundilanga and Uwemba), and 2 dispensaries (Ndzengerendeti, Iwungilo).

Study Population

This study involved HIV infected pregnant women and lactating mothers attending PMTCT option B+ Services in Njombe Town Council

Study Design

This was a cross sectional descriptive study conducted in Njombe Town Council in September 2016 among HIV infected pregnant women and lactating mothers attending PMTCT option B+ Services in Njombe Town Council. Study participants were interviewed using a structured questionnaire which was partly designed by the PI and partly adapted part from Tanzania Demographic and health survey [13] and the scales from Likert-type scales, statistical methods and effect sizes [14].

Sampling Methods

This study employed a non-random purposive sampling in selecting health facilities to conduct data collection. This technique was opted because each individual health facility was chosen depending on the volume of clients where by the 7 facilities with a minimum number of 30 clients visiting per day were selected. The study participants were interviewed during routine services as they exit from PMTCT room.

Methods of Data Collection

For each facility the principal investigator (PI) oriented research assistants on the interview guide and then pretesting of the questionnaires was done. Interviews were conducted at RCH units where PMTCT services are provided. Participants were allowed to follow the normal RCH routine care where by on arrival at the clinic, nurses gave health education on pregnancy and postnatal-related issues including PMTCT and nutrition services as usual. Clients in the PMTCT room were invited individually to participate in the study and those who agreed were given a consent form to sign. The researcher identified a convenient place and once agreed upon by the consenting women, interviews were conducted using a questionnaire. The questionnaires were given code numbers from one to one hundred and ninety six. The interview was offered under great privacy and the face-to-face opportunity which helped to build the rapport that was necessary for participants to feel comfortable discussing extremely personal and

sensitive issues [15]. Study participants were thanked for their cooperation and assured that their information will be confidential and will not be tied to their identity

Data Analysis

Data analysis was done using SPSS 20.0, and the results presented in odds ratio. Chi square was performed to determine the association between the independent variables (socio-cultural, economic and institutional) on the dependent variable (attendance to PMTCT option B+ services). Bivariate and multivariate analysis were done in order to determine crude and adjusted P-values where by those of less than 0.05 were considered statistically significant

Ethical Consideration

Ethical clearance was sought from MUHAS ethical committee. Permission to collect data was granted by RMO, DMO and head of departments in Njombe T.C. From every participant an informed written consent was sought and every client was free to participate or not participate and without interference with treatment protocols.

RESULTS

Sample Size Description and Characteristics of Respondents

The study comprised of 196 respondents with mean age28.5 years ranged from 20years to 40years, with largest age category of 30 to 34 years and smallest being from 35 years and above. Majority of respondents (81.1%) had primary education, 66.8% were married and 66.7% were lactating mothers. **Table 1**. However, 123 of all participants had never missed attendance since they were enrolled and 73 participants had missed attendance.

Table1: Respondent's Characteristics (n = 196)

Variable	Category	Frequency (n=196)	Percentage, %
Age categories	20 -24	54	27.6
	25 -29	55	28.1
	30 -34	66	33.7
	35 and above	21	10.7
Marital status	Single parents	52	26.5
	Married	131	66.8
	Divorced/separated	12	6.6
Educational level	No formal education	10	5.1
	Primary school	159	81.1
	Secondary School and above	27	13.8
Time since initiation	Less than 1 year	98	50

ARV			
	More than 1 year	98	50
Occupation status	Employed	7	3.6
	Business women	65	33.2
	Unemployed/ peasant	86	43.9
	Housewife	38	19.4

Reasons for missing appointments as reported by participants.

Traveling was the common reason (21%) given by the participants followed by lack of bus fare or transport (17%) and being very sick (16 %). **Table 3**.

Table3: Reasons for missing appointments (n=73)

Reasons	Frequency	Percentage
TRAVELLED	15	21%
WAS VERY SICK	12	16%
BUSY WITH ECONOMIC ACTIVITIES	9	12%
NO BUS FARE/NO TRANSPORT	13	17%
TIRED OF MEDICATION	5	7%
WAS FEELING NOT SICK	5	7%
ALTENATIVE MEDICINE	4	5%
WENT TO PRAYERS AND BELIEVED CURED	4	5%
FORGETTING	3	4%
STIGMA OF RELATIVES	3	4%

Association between Socio-demographic Variables and Missing Appointments

Age group above 35 years had increased risk of missing appointments in the PMTCT clinics (AOR=1.7, 95%CI=0.51-6.07). However, this age group has no statistical significance since 95% CI includes one. Women who were divorced were (AOR=12.2, 95% CI=1.77-85.8) more likely to miss PMTCT clinics compared to those who were single. On the other hand, women with secondary education and above were (AOR=12.2 95% CI=1.77-83.8) more likely to miss PMTCT clinics as compared to those with no formal education. Being housewife was found to be protective factor, as housewives were (AOR=0.4, 95% CI=0.13-0.98) likely to miss PMTCT clinics as compared to businesswomen. Other factor like maternal status (whether pregnant or lactating)and duration on ARVs were not associated with attendance to PMTCT clinics. **Table 4**

Table 4: Association between socio-demographic variables and missing appointments

Variable	Category	N (%)	AOR(95%CI)	p-value
Age categories	20 -24	23(42.4)	Ref	
	25 -29	17(30.9)	0.6(0.26-1.48)	
	30 -34	21(31.8)	0.3(0.09-0.69)	0.007
	35 and above	12(57.1)	1.7(0.51-6.07)	
Marital status	Single parents	22(42.3)	Ref	
	Married	40(30.5)	0.9(0.41-2.02)	
	Divorced/separated	11(84.6)	12.2(1.77-85.8)	0.011
Education level	No formal education	1(10.0)	Ref	
	Primary school	66(41.5)	6.7(0.78-57.12)	
	Secondary School and above	6(22.2)	12.2(1.77-83.8)	0.011

Mother status	Pregnant	33(50.0)		
	Lactating	40(30.8)	0.6(0.29-1.46)	0.309
Occupation status				
	Business women	31(47.7)		
	Unemployed/ peasant	33(38.4)	0.6(0.28-1.37)	
	Housewife	9(23.7)	0.4(0.13-0.98)	0.047

Various norms and beliefs were assessed, and it was found that women who were generally much affected by norms and beliefs were (AOR=4.1, 95% CI=1.71-9.92) more likely to miss PMTCT clinic as compared to those who were not affected at all. Indeed, women who were moderately affected by their religious beliefs were (AOR=4.4, 95% CI= 1.25-15.67) more likely to miss PMTCT clinic as compared to those who were very much affected by their religious beliefs. Moreover, those who gained very little community cooperation were (AOR=9.9, 95%CI=1.68-59.0) more likely to miss PMTCT clinic as compared to those who gained much community support. **Table 6**

Table 6: Multivariate analysis showing association between norms / beliefs/ disclosure and missing appointments

Norms and beliefs	**Missed(N=73)**	**AOR(95% CI)**	**P-value**
To what extent do the norms and beliefs in your society make HIV+ pregnant and lactating mothers not to be involved in PMTCT services?			
Not at all	44(29.1)		
Little	12(75.0)	3.1(0.71-13.87)	
Much	17(58.6)	4.1(1.71-9.92)	0.002
To what extent does your religious beliefs affect you from attending to the PMTCT services			
Not at all	52(32.3)	0.6(0.25-1.58)	
Some how	16(76.2)	4.4(1.25-15.67)	0.021

Much	5(35.7)	Ref	
Gets partner cooperation			
Not at all	22(68.7)		
Little/very little	28(61.9)	0.5(0.12-2.38)	
Much/very much	23(21.9)58	0.4(0.09-1.57)	0.189
Gets community cooperation			
Not at all	32(52.3)		
Little/very little	22(91.6)	9.9(1.68-59.05)	0.011
Much/very much	19(18.1) 52	0.3(0.08-1.28)	

Transportation cost and distance from home to PMCT clinic were other factors which were assessed to find their association with missing clinic attendance.

It was found that 82.4% of women who were not affected by transport fare at all never missed clinics as compared to 43.3% of women who were affected by transport fares. Moreover, more than three quarter (83.1%)of women who lived within 5 kilometers from PMTCT clinics and used to walk to and from the clinics never missed clinics as compared to less than a half (49.6%) of women who lived beyond 5 kilometers and needed car or bus to reach the clinic.

Again, more than half of respondents (66.1%) who could not access their roads throughout the year missed PMTCT clinic as compared to less than one third (24.8%) of respondents who had access to their roads towards the clinic throughout the year. However, in logistic analysis only road accessibility throughout the year was found to affect PMTCT clinic attendance as those who could not access their roads towards clinic were (COR=2.4, 95% CI=1.06-5.34) more likely to miss PMTCT clinics compared to those who could access their roads throughout the year.**Table 8**

Table 8: Multivariate analysis showing association between Transport fares and Distance to clinic and missing appointments.

Transportation costs	**Missed clinic(N=73)**	**AOR**	**P- value**
To what extent does the transport fare affect your attendance to this clinic for PMTCT			

services			
Not at all(74)	13(17.6)		
Very little(25)	5(20.0)	0.5(0.11-2.50)	
Much(97)	55(56.7)	0.9(0.21-4.35)	0.953
To what extent does the distance from where you live to this facility affects your attendance			
Not at all	9(15.0)		
Very little	5(19.2)	0.8(0.16-3.77)	
Much	59(53.6)	0.7(0.11-4.56)	0.721
Means of transport to the facility			
Walking	5(12.8)		
Bicycle/motor	20(44.4)	2.4(0.53-11.25)	
Car/bus	48(42.8)	0.7(0.35-4.27)	0.756
Road accessibility throughout the year			
Yes	34(24.8)		
No	39(66.1)	2.4(1.06-5.34)	0.036

Institutional factors analyzed in this study were **privacy, confidentiality and services satisfaction.** Those who did not experience privacy during provision of PMTCT services were (AOR=3.582, 95% CI=1.59-8.06) more likely to miss PMTCT clinics as compared to those who experienced enough privacy when receiving PMTCT services. Those who were not satisfied with PMTCT services were (AOR=8.8, 95% CI= 3.07-25.61) more likely to miss PMTCT clinics as compared to those who were satisfied with PMTCT services. Spending much time in the clinic significantly influenced missing clinic attendances as women who spent more than one hour in the clinic were (AOR=1.8, 95%CI=1.37-8.23) more likely to miss clinics as compared to those who spent less than one hour in the clinic. **Table 9** and **Table 10**

Table10: Multivariate analysis showing association between institutional factors and missing appointments

Institutional factors	**Missed(N=73)**	**AOR(95%CI)**	**P-value**
Is there enough privacy in this institution?			
Yes	54(32.5)	Ref	0.002
No	19(63.3)	3.58(1.59-8.06)	
Is there enough confidentiality in this institution?			

Yes	53(32.6)	Ref	
No	20(53.1)	5.42(2.24-13.10)	0.001
To what extent lack of confidentiality in this institution hinder your attendance?			
Much/very much	47(62.0)	7.55(1.09-52.35)	0.041
Little	26(15.4)	Ref	
Are PMTCT services in this facility satisfactory?			
Strong agree	41(26.2)	Ref	
Agree	15(30.4)	3.55(1.510-8.38)	0.004
Disagree	17(43.3)	8.87(3.074-25.61)	
To what extent does time spent while awaiting for services affects your attendance to PMTCT services?			
Not at all/little	8(8.8)	Ref	
Much/very much	65(61.9)	15(4.59-50.31)	0.0001
Average time spend at the clinic			
One hours	4(7.3)	Ref	
Above 1 hours	69(48.9)	1.8(1.37-8.23)	0.476

DISCUSSION

A total of 196 pregnant and lactating women were involved in this study of which two third reported never missed clinics since initiated ARV. This is a good sign for the PMTCT program achieving its intents in preventing MTCT and reducing transmission rate to less than 5%[5]. Participants who reported to miss clinic gave reasons for their missing and the most reason was that they travelled to other places (21%). The other reason is that they were very sick on their appointment day (16%) and others were busy with income generating activities (14%). The results are similar to what was reported by a study by Ngarina in 2013 that overwhelming demands of everyday life, poverty and lack of empowerment also posed significant barriers to long-term schedule adherence[17].

Looking at the sociodemographic factors women who were divorced were (AOR=12.2, 95% CI=1.77-85.8) more likely to miss PMTCT clinics compared to those who were single. On the other hand, women with secondary education and above were (AOR=12.2 95% CI=1.77-83.8) more likely to miss PMTCT clinics as compared to those with no

formal education. Being housewife was found to be protective factor, as housewives were (AOR=0.4, 95% CI=0.13-0.98) less likely to miss PMTCT clinics as compared to businesswomen. Other factor like maternal status (whether pregnant or lactating) and duration on ARVs were not associated with missing clinics.

The association of norms and beliefs and missing PMTCT services was assessed, and it was found that women who were generally much affected by norms and beliefs were (AOR=4.1, 95% CI=1.71-9.92) more likely to miss PMTCT clinic as compared to those who were not affected at all. Indeed, women who were moderately affected by their religious beliefs were (AOR=4.4, 95% CI= 1.25-15.67) more likely to miss PMTCT clinic as compared to those who were very much affected by their religious beliefs. Moreover, those who gained very little community cooperation were (AOR=9.9, 95%CI=1.68-59.0) more likely to miss PMTCT clinic as compared to those who gained much community support. Other norms and beliefs like partner cooperation, disclosure of HIV status to partner and family cooperation were not associated with missing PMTCT clinics.

The results are not different from those of one study in 2014, which reported that there were some beliefs that, ARVs makes HIV+ mothers to regain their health and therefore increase rate of promiscuity. This triggered negative attitude to their partners prohibiting them from attending services to avoid infidelity. Also from other study by Wasti et al (2012) religious obstacles, stigma and discrimination were the most-frequently reported factors[18].

Transportation cost and distance from home to PMCT clinic were other factors, which were assessed to find their association with missing clinic attendance.

More than half of respondents (66.1%) who could not access their roads throughout the year missed PMTCT clinic as compared to less than one third (24.8%) of respondents who had access to their roads towards the clinic throughout the year. However, in logistic analysis only road accessibility throughout the year was found to affect PMTCT clinic attendance as those who could not access their roads towards clinic were (COR=2.4, 95% CI=1.06-5.34) more likely to miss PMTCT clinics.

In a qualitative study with 45 participants in Uganda using thematic analysis it was found that, of the economic constraints barriers, costly transport in order to attend

monthly checkups was the greatest barrier to treatment in PMTCT program[19]. It is obvious that poverty and transport problems limit the ability to access healthcare. Similar findings were reported in another study in South Africa [20]

Institutional factors like privacy, confidentiality, adequacy of PMTCT services, and satisfaction of the services given at the clinic were assessed. Those who did not experience privacy during provision of PMTCT services were (AOR=3.582, 95% CI=1.59-8.06) more likely to miss PMTCT clinics as compared to those who experienced enough privacy when receiving PMTCT services. Those who were not satisfied with PMTCT services were (AOR=8.8, 95% CI= 3.07-25.61) more likely to miss PMTCT clinics as compared to those who were satisfied with PMTCT services. Spending much time in the clinic significantly influenced missing clinic attendances as women who spent more than one hour in the clinic were (AOR=1.8, 95%CI=1.37-8.23) more likely to miss clinics as compared to those who spent less than one hour in the clinic.

Similar results were observed in other studies[21,22]. On the other hand, 72.6% of those who ever missed a visit reported that the health facility environment/structure hinder their attendance for PMTCT services. Other studies have reported barriers like poor health care worker attitudes, poor quality of counseling and information and confidentiality breaches [23,24] and sub-optimal layout of clinics contributed to lack of privacy [25]. Since this was not observed in our setting it does not mean that it is not there, since there were few participants who reported very much affected by privacy and confidentiality therefore strengthening of the system on issues of confidentiality should continue so that we do not give a chance to distort the current status.

Conclusion

Social cultural factors like age being divorced/separated, educational level of secondary school and above, Norms and beliefs including religious beliefs were associated with likelihood of missing clinic. On the other hand, economic factors studied with the exception of lack of road accessibility throughout the year were not associated with missing clinic. Lack of privacy, confidentiality and satisfaction to the services provided by the HCPs were associated with likely hood of missing clinic

Recommendation

More strategies and sustainability measures for improving attendance into PMTCT services in Njombe Town Council need to be revised and improved.

Further study, with large sample size, should be conducted, as it will also help to find out more about the associations of multiple factors with missing PMTCT option B+ clinic.

Limitations

This study could not involve those who are lost to follow up.

COMPETING INTERESTS

The authors report no competing interests

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REFERENCES

1. WHO. World Health Organization. HIV/AIDS - WHO Fact sheet. Vol. 360, WHO website. 2015.
2. Unaids. GLOBAL REPORT: UNAIDS report on the global AIDS epidemic 2013 [Internet]. Unaids. 2013. 198 p. Available from: www.unaids.org/.../unaids/.../2013/gr2013/UNAIDS_Global_Report_2013
3. WHO, UNICEF, UNAIDS. Global HIV/AIDS Response Progress Report 2011 [Internet]. Vasa. 2011.
4. WHO. WHO Global Tuberculosis Report 2014. WHO Rep. 2014;2013–4.
5. TACAIDS, NBS. Tanzania HIV/AIDS and Malaria Indicator Survey 2011–12. THMIS Rep [Internet]. 2013;103–10.

6. Unaids. Countdown to zero: GLOBAL PLAN TOWARDS THE ELIMINATION OF NEW HIV INFECTIONS AMONG CHILDREN BY 2015 AND KEEPING THEIR MOTHERS ALIVE [Internet]. UNAIDS. 2011.

7. UNAIDS W. UNAIDS report on the global AIDS epidemic [Internet]. … Programme on HIV/AIDS (UNAIDS) and World Health …. 2012.

8. Padian NS, McCoy SI, Karim SSA, Hasen N, Kim J, Bartos M, et al. HIV prevention transformed: The new prevention research agenda. Lancet [Internet]. 2011;378(9787):269–78.

9. Ciaranello AL, Perez F, Maruva M, Chu J, Engelsmann B, Keatinge J, et al. WHO 2010 guidelines for prevention of mother-to-child HIV transmission in Zimbabwe: modeling clinical outcomes in infants and mothers.

10. World Health Organization, Who WHO. World Health Statistics 2012. Vol. 27, World Health Statistics 2012. 2012. 171 p.

11. UNICEF. UNICEF [Internet]. UN Convention. 2013. p. 1–209. Available from: http://www.unicef.org.uk/Documents/Publication-pdfs/UNCRC_summary.pdf

12. Weiss SM, Peltzer K, Villar-Loubet O, Shikwane ME, Cook R, Jones DL. Improving PMTCT uptake in rural South Africa. J Int Assoc Provid AIDS Care. 2014;13(3).

13. TDHS. Tanzania Demographic and Health Survey. National Bureau of Statistics Dar es Salaam, Tanzania ICF Macro Calverton, Maryland, USA. 2010.

14. Judy Robertson. Likert-type scales, statistical methods, and effect sizes. Commun ACM. 2012;5(1):6–7.

15. Rubin H, Rubin I. Rubin, Rubin (2005) Design.pdf. In: The Art of Hearing Data. 2005. p. 39–63.

16. Geldsetzer P, Yapa HMN, Vaikath M, Ogbuoji O, Fox MP, Essajee SM, et al. A systematic review of interventions to improve postpartum retention of women in

PMTCT and ART care. Vol. 19, Journal of the International AIDS Society. 2016.

17. Ngarina M, Popenoe R, Kilewo C, Biberfeld G, Ekstrom AM. Reasons for poor adherence to antiretroviral therapy postnatally in HIV-1 infected women treated for their own health: experiences from the Mitra Plus study in Tanzania. BMC Public Health [Internet]. 2013;13(1):450.

18. Wasti SP, Simkhada P, Randall J, Freeman J V., Van Teijlingen E. Barriers to and facilitators of antiretroviral therapy adherence in Nepal: A qualitative study. J Heal Popul Nutr. 2012;30(4):410–9

19. Duff P. HIV infection in women. Prim Care Update Ob Gyns. 1996;3(2):45–9..

20. Skinner D, Mfecane S, Gumede T, Henda N, Davids A. Barriers to accessing PMTCT services in a rural area of South Africa. Afr J AIDS Res. 2005;4(2):115–23.

21. Lyatuu MB, Msamanga GI, Kalinga a K. Clients' satisfaction with services for prevention of mother-to-child transmission of HIV in Dodoma Rural district. East Afr J Public Health. 2008;5(3):174–9

22. Hardon A, Vernooij E, Bongololo-Mbera G, Cherutich P, Desclaux A, Kyaddondo D, et al. Women's views on consent, counseling and confidentiality in PMTCT: a mixed-methods study in four African countries. BMC Public Health. 2012;12(1):26.

23. (UNICEF) UNCF. Opportunity in Crisis. Preventing HIV from early adolescence to young adult. Intern Audit [Internet]. 2009;65(3):7. Available from: http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=41566003&site=ehost-live.

24. Varga C, Brookes H. Factors influencing teen mothers' enrollment and participation in prevention of mother-to-child HIV transmission services in Limpopo Province, South Africa. Qual Health Res. 2008;18:786–802.

25. Muchedzi A, Chandisarewa W, Keatinge J, Stranix-Chibanda L, Woelk G, Mbizvo E, et al. Factors associated with access to HIV care and treatment in a prevention of mother to child transmission programme in urban Zimbabwe. J Int AIDS Soc [Internet]. 2010;13(1):38