Addis Ababa University

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Effect of Anteritroviral Therapy(ART) on Fertility Intention and contraceptive prefernce of HIV positive women in Addis Ababa, Ethiopia

Hussen Mekonnen



Source: http://en.wikipedia.org/wiki/Addis_Ababa

Dissertation for the Degree of Doctor of Philosophy (PhD) in Public Health, School of Public Health Addis Ababa University, Ethiopia

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Addis Ababa University

School of Graduate Studies

EFFECT OF ANTERITROVIRAL THERAPY(ART) ON FERTILITY AND CONTRACEPTIVE PREFERNCE OF HIV POSITIVE WOMEN IN ADDIS ABABA, ETHIOPIA

A DISSERTATION SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF ADDIS ABABA UNIVERSITY IN PARTIAL FULFILMENT OF OF THE REQURIEMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY (PhD) IN PUBLIC Health

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Internal Examinor	Signature and date

Dedication

This dissertation is dedicated to Ethiopian women who lost their lives due to HIV and pregnancy.

ORIGINAL ARTICLES

I. *Hussen M. Asfaw, Fikre E.Gashe:* **Fertility intentions among HIV positive women aged 18-49 years in Addis Ababa, Ethiopia**. A cross sectional survey; published at *BMC Reproductive health, 2014, **11**:36 doi:10.1186/1742-4755-11-36*

II. *Hussen M. Asfaw, Fikre E.Gashe:* **Contraceptive use and method preference among HIV positive women in Addis Ababa Ethiopia: A comparative cross sectional survey; Published at BMC Public health, 2014, 14:566;doi:1471-2458/14/566**

III. *Hussen M. Asfaw, Fikre E.Gashe:* **Change in fertility intentions 12 months after ART initiation among HIV positive women in Addis Ababa, Ethiopia: Follow up study** *(submitted to Ethiopian Medical Journal :under review(MS:3040)*

IV. *Hussen M. Asfaw, Fikre E.Gashe:* **Fertility desire, contraceptive decision making and support to HIV positive women: providers and clients perceptions and experience in Addis Ababa, Ethiopia. (**submitted BMC RH, under review(MS:1971243659112347)

ACRONYMS AND ABBREVIATIONS

AAU	Addis Ababa University
AIDS	Acquired Immune Deficiency Syndrome
ART	Antiretroviral Therapy
ARV	Antiretroviral
CDC	Center for Disease Control and Prevention
CHCT	Comprehensive HIV Counsling and Testing
CI	Confidence Interval
CPR	Contraceptive Prevalence Rate
CSA	Central Statistical Agency
DCH	Department of Community Health
DHS	Demographic and Health Survey
EDHS	Ethiopia Demographic and Health Survey
FGD	Focus Group Discussion
FP	Family Planning
HAART	Highly Active Antiretroviral Therapy/Treatment
HIV	Human Immunodeficiency Virus
IDI	In-depth Interview
IRB	Institutional Review Board
ITECH	International Training Education and Communication for Health
IUCD	Intrautrine Contraceptive Device
IUD	Intrauterine Device
KII	Key Informant Interview
MDGs	Millennium Development Goals
MOH	Ministry of Health
NGO	Non-Governmental Organization
NNRTI	Non nucleotide reverse transcriptase inhibitors
NRTI	Nucleotide Reverses Transcriptase Inhibitors
OCP	Oral Contraceptive Pills

OR	Odds Ratio
PEPFAR	President's Emergency Plan for AIDS Relief
PI	Principal Investigator
PLWHA	People living with HIV/or Manifestations of AIDS
PMTCT	Prevention of Mother- to- Child Transmission of HIV
MTCT	Mother to Child Transmission of HIV
RH	Reproductive Health
SPSS	Statistical Package for Social Sciences
SRH	Sexual and Reproductive Health
STIs	Sexually Transmitted Infections
UNICEF	United Nations International Children's Fund
UNAIDS	United Natitoins program on HIV/AIDS
UN	United Nations
UNFPA	United Nations Polpulation Fund
USA	United States of America
USAID	United States Agency for International Development
VCT	Voulentary Counceling and Testing
W H O	World Health Organization

GLOSSARY OF OPERATIONAL DEFINITIONS

Antiretroviral therapy (ART) use: defined as use of combination of Nucleotide Reverses Transcriptase Inhibitors(NRTIs)**,** either efaveranze (EFV) or Neverapin (NVP) based first line drugs , or use of nucleotide reverse transcriptase inhibitors (NRTIs) with protease inhibitors(PIs) (leponavir/ritonavir(LPV/r) or atazanavir/ritonavir (ATV/r)) backbone of second line drugs.

ART users: we considered women to be ART users if they had been receiving ART for at least one month and,

ART-naïves: if they had never taken ART, prior to the data collection period.

Casual sex partner: means someone who is not a husband or a regular sexual partner but the study participant had sex with at least once in the past 6 months.

Contraceptive use: refers to the couple's use of any contraceptive methods for the last 6 months that is, the modern contraceptive method. The choices of contraceptive methods include the following: injectables (Depot), implants (implanon or jadelle), oral contraceptive pill (OCP), intra uterine contraceptive device (lUCD), male/female condom, diaphragm, permanent methods such as, tubal ligation and vasectomy. The categories are: 'yes' if the husband or the wife is using any contraceptive method at the time of interview, and 'no' if not any of them is using any family planning method.

Dual contraceptive methods use was defined as use of primarily the male condom with the combination of hormonal or other contraceptive methods like intra utrine contraceptive devices (IUCD).

Fertility Desire: defined by the response to a question asking whether the respondent would like to have children in the future

Fertility Intention: defined by a separate question asking how many children the respondent expected to have in the future for detailed description, see the methodology

Lost to follow up: HIV positive women was considered as lost to follow up, when the client was not traced for three months either by four calls and/or one home visit and failed to trace the home or found that she was relocated to inaccessible place.

Protected sexual intercourse (**consistent condom use)** was described as use of condoms in all penile-vaginal sexual relationships with casual and/or steady partners was considered if women

answered questions related to it with “always”. Those who replied to these questions with “sometimes”, “rarely” or “never” were regarded as inconsistent condom users.

Regular Partner: mean the study participant have had sex with either husband or steady partner regularly in the past 6 months.

Sexually Active: for the purposes of this study defined as penile-vaginal intercourse with a male partner in the past 6 months.

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ABSTRACT

Background: The advent of antiretroviral therapy (ART) has improved quality of life and survival for people living with HIV (PLWH) and now days HIV infection can be seen as a chronic manageable disease, as a result many will contemplate child bearing. Although, ART has influence in improving quality of life and reduce mother to child transmission of HIV virus (MTCT) in developed countries, vertical transmission accounts for more than 90% of pediatric AIDS in prevalent areas, as a result, reproductive assistance to HIV positive women is important to have informed decision making about child bearing and child rearing.

In Ethiopia, while anti-retroviral therapy (ART) services are increasingly available, information about fertility intentions, contraceptive use and method preference among women living with HIV in relation to ART use is scarce. Moreover, change in fertility intentions 12 months after ART intiation and reasons in selection of those options are lacking. Those factors raise concern on possible exposure of many HIV positive women to the potential risk of unintended pregnancy and hinder them from seeking options.

Objectives: the purpose of the study was to assess effect of ART on the fertility intentions and contraceptive use and method preference of HIV positive women in Addis Ababa, Ethiopia.

Methodology: Health facility based cross sectional quantitative and qualitative studies including follow up studies were conducted. For the quantitative part, a total of 1855 HIV positive women aged 15-49 years for cross sectional survey and 360 HIV positive women participated for the follow up study. Focus group discussion, in depth interviews and key informant interviews were done for the qualitative part. Data were collected from June 2012 to December 2013 using validated structured questionnaires for quantitative and semi structured questionnaires for qualitative part. Data were double entered in to epidemiological software (Epi Info version 3.5.1). Descriptive statistics, bivareate and multivariate statistical analysis were done using SPSS version 20 soft ware.

Results: Overall, 44% of women reported childbearing intention and 71% women reported using contraception 75% (n=579) ART users and 65% (n=422) ART naïve women. Male condom and injectables were the most preferred contraceptive methods among both groups. The proportion of fertility intention 12 months after antiretroviral therapy (ART) initiation was higher among ART initiated 55.5% (n=106) than ART naïve 40% (n=68) women. The presence of ART, improvement of health condition and the influence of husband, family, community and associated stigma were the main reasons for childbearing intentions of women in the study area.
In adjusted logistic regression analysis, ART users had higher fertility intention (AOR; 1.26, 95%CI; 1.01 to 1.60) than ART naïve. Furthermore, being in a sexual relationship, young age, being single and having fewer or no children were found to be predictors of fertility intentions.
Women receiving ART reported more use of contraceptives (AOR 1.60, 95% CI, 1.30- 2.12) than ART naïve women. In addition to this, presence of partner (AOR 2.32, 95% CI, 1.60-3.40), disclosure of HIV status to husband (AOR 2.23, 95 % CI, 1.21-4.12), presence of living children: one (AOR 1.7, 95% C I, 1.03-2.40), two (AOR 2.6, 95% CI, 1.7-4.02) and three (AOR 3.3, 95% CI, 1.90-5.60) respectively were found to be predictors of contraceptive use among HIV positive women.

Overall, 41.0 % (147/360) of the women reported fertility intentions at the baseline, while 48.3 %(174/360) reported fertility intentions 12 months after follow up. The proportion of fertility intention 12 months after antiretroviral therapy (ART) initiation was higher among ART initiated 55.8% (106/190) than HAART naïve 40% (68/170) women. Furthermore, the need for more children 12 months after ART initiation was significantly associated with woman's ART use (AOR, 2.46, 95%CI, 1.20-5.20). Single and married women (AOR, 5.32, 95%CI, 1.10-25.92) (AOR: 6.34, 95%CI, 1.43-27.99) respectively, were more likely to report fertility intention than divorced/ widowed women. Women who had at least one child (AOR, 0.32, 95% CI, 0.13-0.85) were less likely to change fertility intentions compared to women with no children.

Conclusions: Fertility intentions are common among HIV positive women and change in intention for a child starts soon after initiation of ART. About three in four HIV positive women use contraceptive methods mainly condoms. Dual contraceptive method use was negligible among the study subjects.

Fertility and contraceptive decisions of women are influenced by presence of ART, partner desire, family and community perception and associated stigma. Many participants indicated that health service providers are supportive in offering information more on preventive methods rather than discussing fertility and contraceptive options.

Recommendations: It is necessary to strengthen an integrated sexual and reproductive health (SRH) service and HIV prevention, ART services to address the diverse SRH needs of HIV positive women in the study area. Furthermore, updating health care providers with fertility and contraceptive knowledge is valuable to enhance family planning and preventive practice of women.

Key words*:* fertility intention, contraceptive use, method preference, HIV, ART, women, Addis Ababa, Ethiopia.

1. INTRODUCTION

1.1. Background of the study

Human immune deficiency virus (HIV) continues to profoundly affect women across the world [1]. Sub-Saharan Africa is the Region most severely affected by HIV [2, 3]. Women of reproductive age account for 58% of the people living with HIV [1] and 53% of all adult deaths [4]. In Ethiopia, more women (1.9%) than men (1.0%) are living with HIV [2, 5]. Most women are particularly vulnerable to HIV due to complex burden they have including physiological, social vulnerability and gender inequalities [4, 6]. Since infected women are of childbearing age [2], they risk infecting their children and thus face difficult choices about childbearing.

Despite the risks and challenges; studies elsewhere revealed that, HIV positive women continue to desire children, after knowing their HIV-positive status [7-9]. Even infection like HIV does not seem to negatively modify subsequent fertility intentions of some patients [10, 11]; also the majority of them intend to have more than two children [12, 13]. The desire to have children in the future has significant implication for the transmission of HIV to sexual partners and new-borns [14, 15].

Furthermore, HIV positive women risk unplanned pregnancies [16]. Worldwide, two in every five pregnancies are unplanned [17]. According to previous studies in 42 sub-Saharan Africa countries, 10-65% of women reported that their last pregnancy had been unplanned [18] . Similarly, 62% of women on ART from South African [19] and 59% of HIV positive women from Kenya reported unplanned pregnancy [20]. Moreover, contraceptive use in sub-Saharan Africa remains low [21]. The percentage of married women aged 15-49 using modern contraceptive methods ranges from 12% in Mozambique and 14% in Ethiopia to 27% in Rwanda [2]. In addition, previous reports indicated that twenty five percent of women with HIV worldwide and one in four married women from sub-Saharan Africa has unmet need for family planning [22].

The advent of antiretroviral therapy (ART) has improved quality of life and survival for people living with HIV(PLWH) and now days HIV infection can be seen as a chronic manageable

disease, as a result many were contemplate child bearing [6, 23-25]. Although, ART has influence in improving quality of life and reduces mother to child transmission of HIV virus (MTCT) in developed countries [26] , vertical transmission accounts for more than 90% of pediatric AIDS in prevalent areas [27], as a result, reproductive assistance to HIV positive women [25, 28] is important to have informed decision making about child bearing and child rearing [23].

1.2. Statement of the problem

With access to ART and preventive care, people living with HIV are better able to consider parenthood [29] compared to previous. Earlier studies involving women on ART have revealed that most pregnancies among HIV positive women might be intentional [26, 30, 31]. Subsequent studies from south Africa reported antiretroviral therapy access has an influence on fertility intentions of HIV positive women [32, 33].

Study from Africa reported that pregnancy rate of women on ART was significantly higher than ART naïve [34]. Study from South Africa stated that ART increased the fertility desire of couples overtime [7] and rates of pregnancies among women recently initiated ART with low CD4 count and viral loads is high [19]. Furthermore, women on ART quickly became pregnant even before their CD4 count was improved because they wanted to fulfill their womanhood roles but also they wanted to prove that they are healthy [35].

However, many HIV positive women are confronted with a risk of unplanned pregnancies. Worldwide, two in every five pregnancies are unplanned [17]. Studies from India and Africa reported high rates of unintended pregnancy (51 to 84%) among women living with HIV [19, 36-39]. A study in Uganda reported that 75% of HIV-positive women had an unmet need for family planning [40]. Women from Asia also lack access to family planning services and experience disproportionately high rates of unintended pregnancy and abortion [41].

Prevention of unintended pregnancy among HIV positive women is the second element of prevention of mother to child transmission of HIV (PMTCT) [42], which is an important means to address associated problems of HIV positive women and children [43]. It is reported to be

cost effective [44], improves quality of life [45], reduces maternal and child mortality [4, 10, 43, 46] and reduces number of positive infants by keeping their mothers alive [47].

Significant improvements have been demonstrated by PMTCT in low and middle income countries [48]. The percentage of pregnant women with HIV receiving antiretroviral therapy (ART) using PMTCT in sub Saharan Africa increased to 50% [4]. However, PMTCT efforts to date gave less emphasis to non pregnant women living with HIV and their contraceptive options [49].

Since childbearing intentions are among the predictors of subsequent fertility behaviors of women [50], creating responsive reproductive health services to HIV positive women in relation to ART, requires clear understanding of expressed childbearing intentions.

Even in the context of expanded access to ART for HIV-infected pregnant women, family planning still needs to be strengthened to avoid unintended pregnancies [51]. HIV positive women have particular preference for contraception and have a right to decide their fertility.
Indeed existing evidence in Ethiopia indicates that 34 to 45% of people living with HIV desiere fertility [52-55] and reported that of those who have ever used, at least one contraceptive method has been used after HIV diagnosis. Condoms, injectables and abstinence were reported to be the most preferred methods [53-55]. However, information on fertility, contraceptive use and method preference among women living with HIV in relation to ART use is scarce. Moreover, change in fertility intentions over time, as well as reason for selection of these methods in relation to ART use is also scarce.

Ethiopia is the second most populous country in Africa [56]; characterized by high fertility of 5.4 children per childbearing age woman [2], Cultural value is attached with having more children as a bless and being childless considered as social violation and stigma [57]. While the majority (91%) of women deliver at home without a skilled attendant [56]; identification of factors associated with fertility and contraceptive options among HIV positive women is useful for establishing intervention priorities in reproductive health.

Furthermore, in the light of preventive efforts on going in Ethiopia, it becomes imperative to assess fertility intention, contraceptive use and method preference with emphasis on HIV positive women who have been enrolled in care; in order to offer appropriate prevention measures and better integration of reproductive health services.

It is anticipated that the findings generated from this study will contribute to knowledge and understanding of the association of ART initiation with fertility intention and contraceptive preference and be useful in developing evidence-based interventions that are undertaken to address fertility intention and contraceptive utilization among ART users in Ethiopia.

Furthermore, it is critically important for health service providers to be able to protect the reproductive rights of HIV-infected women through creating increased access to sexual and reproductive health services and sex education, so that women may decide freely and responsibly on their fertility issues. The data generated may provide adequate information about the current situation of reproductive health services among HIV positive women. It will be useful also to policy makers, planners, stakeholders, educators and other community-based organizations to design appropriate intervention programs. More importantly it will help to involve HIV positive women themselves in prevention, care and support activities to enable them to establish sustainable effort to curb the HIV pandemic.

1.3. Rationale of the study

Women are particularly vulnerable to HIV due to complex burden they have including, physiological, social vulnerability and gender inequalities [4, 6]. Despite the risks and challenges; studies revealed that, HIV positive women have fertility desire; after knowing their HIV-positive status [7-9]. Earlier studies involving women on ART have revealed that most of pregnancies among positive women might be intentional [26, 30, 31]. Subsequent studies from sub-Saharan Africa reported that ART has an influence on fertility intentions of HIV positive women [32, 33] and many of them have strong desires for biological children.

Although, ART has influence on improving quality of life and reduces mother to child transmission of HIV virus (MTCT) in developed countries [26], vertical transmission accounts

for more than 90% of pediatric AIDS in prevalent areas [27]. As a result, reproductive assistance to HIV positive women [25, 58] is important to keep them acquire informed decision making about child bearing and child rearing [23].

Even in the context of expanded access to ART for HIV-infected women, fertility and family planning program still needs to be strengthened to avoid unintended pregnancies [51]. However, less emphasis has been given to fertility and contraceptive issues to women living with HIV [49]. Women living with HIV experience high rates of unmet need for family planning and unintended pregnancies. Some studies suggest that the rates of contraceptive use among HIV-positive women exceed those of women without HIV or women in the general population [39, 59, 60]. However, condoms are reported as the method most often used for pregnancy prevention; and consistent condom use among HIV-positive women has been shown to be low [61].

Indeed existing evidences in Ethiopia have indicated fertility desire of people living with HIV [52-55]. Studies reported that of those who have ever used at least one contraceptive method after HIV diagnosis, condom, injections and abstinence are reported to be the most preferred methods [52-55]. However, information on fertility and contraceptive options, reasons for selection of methods and the influence of ART on fertility and contraceptive use is scarce. Furthermore, there are efforts undergoing in Ethiopia to address issues of HIV prevention of mother to child transmission [56]. It is worth to update such efforts and provide information about the existing situation on fertility, contraceptive options and change in fertility intentions over time in the study area and augment the existing care and support activities.

Thus, the current study tried to use multiple approaches by involving both HIV positive women that are on ART and ART naïve. In addition, health care providers were taken as source of information on the care and support activities they provide to HIV positive women so as to gain a clear picture of their experience and understanding of the current fertility intentions, contraceptive use and preference, change in the fertility intentions after ART initiation.

1.4. Litriature Review

1.4.1. Epidemiology of HV/AIDS

The history of HIV/AIDS begins from a pattern of highly unusual infection in otherwise healthy young adults emerged in the early 1980s in the United States of America. This pattern or clusters of diseases that appeared in those whose immune system being attacked came to be called Acquired Immune Deficiency Syndrome (AIDS). Between 1983 and 1994, a new virus called Human Immunodeficiency Virus (HIV) was identified as a cause of AIDS [62].

Human Immunodeficiency Virus (HIV) is the virus that causes Acquired Immune Deficiency Syndrome (AIDS). People are said to be HIV positive when the HIV antibody is detected in their blood. HIV attacks and destroys certain types of white blood cells that are essential to the body's immune system, the biological ability of the human body to fight infections. The infected person becomes susceptible to a wide range of opportunistic infections, such as tuberculosis, pneumocystis pneumonia (PCP) and Kaposi sarcoma [62].

The virus can be transmitted by unsafe sexual contact, unsafe blood transfusion, mother to child transmission and unsafe practices. But HIV cannot be transmitted in our day to day social interactions such as eating together, sharing common feeding material, swimming together, using common toilet or sharing common linen or blanket [63].

The natural history of untreated HIV is classified in to acute retroviral syndrome(2-3 weeks), recovery and sero-conversion (2-4 weeks), Asymptomatic chronic HIV infection(average 8 years), symptomatic HIV infection/AIDS(average 13 years) and death [64].

Human immunodeficiency virus (HIV) has created an enormous challenge to humankind [65], as well as a social dilemma especially among women of childbearing age [8, 66]. According to UNAIDS; globally the number of people living with HIV/AIDS (PLWH) was estimated to be 35.3 million [32.2 million-38.8 million] by the end of 2012. There were 2.3 million (1.9 million –2.7 million) new HIV infections globally, showing a 33% decline in the number of new infections from 3.4 million (3.1 million –3.7 million) in 2001 [4]. Of the total number of

PLWH, 30.8 million are adults (15- 45 years) and 2.5 million are children under 15 years of age. Women account for approximately 52% of the adult population living with HIV/AIDS [27].
Sub-Saharan Africa remains most severely affected, with nearly 1 in every 20 adults (4.9%) living with HIV and accounting for 69% of people living with HIV worldwide [1]. In 2009, an estimated 15.7 million women above the age of 15 years were living with HIV globally, and 1.4 million of them became pregnant. Nearly 90% of those expectant mothers were living in 22 countries in sub-Saharan Africa and India [1]. By the end of 2011, sub-Saharan Africa which has only 10% of the total global population, accounted for 22.5 million [1], 69% of all people living with HIV (PLWH), 72% of AIDS deaths and 70% of all the new infections among adults and 91% of new infection among children worldwide [62].

Since first evidence of the HIV epidemic was detected in Ethiopia in 1984, AIDS has claimed the lives of millions and left behind an estimated 1 million orphans [5]. The national prevalence of HIV in the year 2011 was estimated to be about 1.5% (female:1.9% and male 1.0%) [5]. The highest HIV prevalence occurs among 15-24 years age groups. HIV Infections occurring among adults between 15-49 years of age account for 91% of all infections [42]. A total of 759,268 PLWH in Ethiopia of those 296,491 were male and 462,777 were female [67], similarly, 38,523 PLWH in Addis Ababa of those 32,947 and 5,576 were male and female respectively. The total prevalence rate of HIV in the City of Addis Ababa is the highest (4.6%) next to Gambella reported to be (5.8%). Further, more women (6.1%) than men (3.2%) are living with HIV in Addis Ababa[67].

1.4.2. Impact of HIV/AIDS on women

Of all infectious diseases, the HIV/AIDS pandemic remains the most serious challenge to public health [25, 66]. HIV has an enormous impact on households, communities, businesses, services and national economies in the sub-Sahara African region [27].

The impact of HIV and AIDS on the lives of women is one of the most critical reproductive health concerns of our times [68]. Women are especially at risk of contracting HIV due to the complex burden they have [6], including biological, economic, and cultural factors [4] . Physical differences make it more likely that a woman will contract the virus from a man than vice versa

[6, 68]. Perhaps more important, powerlessness, dependence and poverty tend to diminish women's ability to protect themselves from unsafe sex [4, 68]. A woman's choices are often limited by her inability to negotiate when or with whom to have sex or whether to use a condom; by society's acceptance of men having sex before or outside marriage and by the need for economic support from men [68].

Those HIV infected women face multiple difficult issues such as fear of disclosing their HIV status, stigmatization, societal pressures to bear children and the effect of pregnancy on their health. HIV infected women follow prevailing community norms, intend to have children and view reproduction as socially and psychologically desirable [69]. In addition, because most infected women are of childbearing age[2], they risk infecting their children and thus face difficult choices about childbearing. As caregivers in their immediate and extended families, women usually care for dying family members and for children orphaned by the disease. All of these factors make the empowerment of women a critical component of programs aiming to curb the epidemic and mitigate its consequences [62].

1.4.3. HIV and fertility

There are several distinct facts pertaining to the association between HIV/AIDS and fertility. To begin with the causality underlying the association can run in either direction: HIV/AIDS can affect fertility desires and outcomes, and fertility can affect the risk of HIV/AIDS. The two may also share common causes that induce an association between HIV/AIDS and fertility. Indeed, the major proximate determinants of HIV infection and pregnancy are virtually the same that is sexual exposure through socially recognized unions or otherwise [25, 70].

Fertility may decline in the era of HIV/AIDS because of delayed onset of sexual relations and age at first union, reduced premarital sexual relations and remarriage and increased marital resolution [25].

A study conducted among HIV sero-positive women in industrialized countries has suggested that an HIV positive diagnosis can disrupt sexual life [66]. The proportion of HIV-infected women desiring a child is somewhat lower than the overall proportion of U.S. women who desire

a child [30]. Several studies have reported declines in fertility rates of women living with HIV/AIDS in SSA [71, 72]. Similarly; a study conducted in African countries showed fertility of HIV positive women is lower than that of HIV negative women, in all, but the youngest age group, and the differential increase with women's age and epidemic duration. A study done in Tanzania confirmed a substantial reduction in fertility by 29% among HIV positive women compared with HIV negative women [25]. In societies with high HIV/AIDS prevalence rates, behavioral influences may lead HIV positive couples to limit family size due to concern about leaving orphans behind after an early death or transmitting infection to the child even if others may desire a large family to ensure survival of children [12, 73].

The Malawi follow up study indicated that HIV infection is a significant predictor of fertility intentions over time [69]. Overall, 842 HIV uninfected and 844 HIV infected women were enrolled. The hazard of changing from wanting no more children at baseline to wanting more children at follow-up was 61% lower among HIV infected women compared to HIV uninfected women. After adjusting for other factors, HIV infected women were 3 times more likely to change to wanting no more children [69]. A change from wanting no more children at baseline to wanting more children during follow-up was significantly associated with the woman's HIV status, maternal age and number of living children after adjusting for other factors, the frequency of desired pregnancy was substantially higher among HIV uninfected women than in HIV infected women in which at baseline 58.7% of HIV uninfected women reported wanting a further pregnancy compared to 26.6% of HIV infected women. After 12 months of follow-up, the frequency of pregnancy was 55.0% among HIV uninfected women compared to 21.1% among HIV infected women. Non-condom contraceptive use was high and although generally stable, showed declining trends among HIV uninfected women from 74.4% at baseline to 70.4% a year later ($P = 0.004$) and increasing trends among HIV infected women [69].

1.4.4. Effect of ART on fertility of HIV positive women

Antiretroviral therapy (ART) has been responsible for a dramatic decrease in AIDS mortality since 1996, and has changed the clinical profile of HIV infection from a sub-acute lethal to a chronic ambulatory disease [74]; as a result the ways in which infected individuals confront the

disease have changed considerably and HIV-related morbidity and mortality have declined markedly [14].

The use of ART substantially reduces significantly the rate of HIV transmission not only between sexual partners [75], but also the probability of prenatal transmission to below 2% [76] Thus, antiretroviral therapy (ART) has become an integral part of the continuum of HIV care [77]. On the other hand, the total number of people living with the virus in 2008 was more than 20% higher than the number in 2000, and the prevalence was roughly three fold higher than in 1990. The continuing rise in people living with HIV reflects the combined effects of continued high rates of new HIV infections and the beneficial impact of antiretroviral therapy [78]

Fertility intension among HIV positive individuals is high as reported from developed and developing countries such as USA, France, Italy and Brazil [24, 30, 79-83]. Studies from Sub Saharan Africa [9, 32, 33, 84] reported that HIV-infected women desire children. This has implication that HIV-uninfected individuals who seek to conceive with an HIV-infected partner risk acquiring HIV. Moreover, earlier studies showed that pregnancy intention is unaffected by HIV diagnosis and reported low contraceptive utilization [10, 11, 30].

With the advent of ART and its increased uptake both in the developed and developing world there was bound to be an impact both on fertility and reproductive plans of HIV-positive people [74]. Regarding a positive impact of ART on fertility, other studies elsewhere in Africa indicated that fertility intention is high among women on ART [84]. A study conducted in Uganda showed that over 17% people living with HIV had produced a child since the HIV diagnosis was made, and 28.6% reported that they would like to have a child in the near future [25].

Furthermore, a study conducted in Zimbabwe indicated a presence of number of a reasons that couples and individuals cited as motivations behind their desire to have children [74]. The most common one was the importance attached to motherhood, especially among those without children [74]. A study conducted in Uganda revealed that marital status and death of child were main factors for fertility intentions of HIV positive women [6].

A study conducted in Northern Nigeria indicated that about 66% of women expressed a desire to have more children [13]. More than 90% wanted to have two or more children. Significant predictors of higher fertility desires were; low parity (OR=6.03) and awareness of partner's sero-status (OR=2.3) [13].

Another study conducted in Nigeria**,** reported that 63.3% of the 147 studied participants expressed a desire for childbearing, even though 50.4% of them already had two children, 93.8% of women who desired children intended to have more than two in the near future [23]. All individuals who had no children intended to bear children in the future, and they constituted 32.3% of those who expressed the desire for childbearing [23]. Multivariate logistic regression analyses of associated factors indicated that having no children and most recent CD4 count significantly increases the odds of intention to have 3 children instead of 1-2 [23].

Conversely, several studies reported no increase in fertility intentions as a result of ART use. A study from South Africa found a lack of association between ART use and childbearing intentions [33]. No association between ART use and fertility desires have been documented in studies in Uganda [9, 25, 85] . Furthermore,no association between fertility intentions and young age, single and whether any of the respondents' children had died [25].

1.4.5. Situation of fertility among HIV positive women in Ethiopia

In spite of the high population growth of over 87 million people in Ethiopia , the current total fertility rate of 5.4 children per reproductive aged woman ranks among the highest in the world [2], considering fertility issue is part of comprehensive care and support activities.

A study conducted in southern part of Ethiopia among HIV positives showed that about 34% HIV positives expressed their desire for children [53]. Moreover, respondents in the age group 15-34 were more likely to desire children (AOR: 1.91, 95% CI: 1.13-3.24) than other age group. Being married (AOR: 1.78, 95% CI: 1.05-3.14) and those who reported no currently alive children (AOR: 4.41, 95% CI: 1.46-13.36) were more likely to desire children [53].

A study conducted in North Wollo revealed that from a total of 660 ART users, 301(45.6%) respondents desired to have children [55]. In addition, the study identified that clients with no children, married and younger age groups were more likely to desire children [55]. Another study from South Wollo also reported that higher family income (OR: 2.29; 95% CI: 1.23, 4.26), partner's decision to have a child (OR: 36.4; 95% CI: 17.0, 77.5) and having a partner with negative HIV test result (OR: 0.408; 95% CI: 0.219, 0.759), were independently associated with fertility decisions [57]. A study from western a part of the country showed that men had great desire to have a child than women (40.5% versus 30.7%), also being male (AOR: 1.7,95% CI: 9.2-25.8), having no living children (AOR:13.1,95% CI: 5.3-32.3) or having less than three living children (AOR: 4.2, 95% CI: 2.2-8.0), having a partner desiring a child (AOR: 15.4, 95% CI: 9.2-25.8), CD4 count ≥200 (AOR: 2.0, 95% CI: 1.2-3.5) were significantly associated with fertility desire [86].

1.4.6. Situation of fertility among HIV positives in Addis Ababa

A study conducted in Addis Ababa, in 2007 indicated that one hundred nine (48%) of HIV positive women receiving care desired to have children [54]. Generally, HIV positive individuals who desired children were younger (18-29 years) (AOR: 3.05, 95% CI: 1.5-6.4), married/in relationship (AOR :3.4,95% CI :2.1-5.6), had no children (AOR: 11.5 ; 95% CI :5.3-24.9) and had a partner who also desired children (AOR: 38.7, 95%CI: 16.7-89.1) [54]. Another study conducted in the same area revealed that from a total of 421 respondents, 174(41.3%) desired to have children in which the desire of the husband or sexual partner have shown significant association with the desire for children (AOR: 33.8,95% CI: 9.3,123) P=0.0001 [52].

1.4.7. Family planning methods among HIV positive women

One of the key contours of the post-international conference on population development (ICPD) era is the broadening of family planning programs to encompass reproductive health needs and rights [21]. In sub-Saharan Africa, such an agenda has been blurred by HIV/AIDS, the leading cause of death among women of reproductive ages. Family planning (FP) programs are key pillars to the reduction of maternal mortality and the prevention of HIV infections and unwanted pregnancies [21].

Despite the potential contributions; FP needs have remained unmet in areas of the world where the prevalence of HIV is highest [87]. The percentage of married women aged 15-49 using modern contraceptive methods ranges from 12% in Mozambique and 14% in Ethiopia to 27% in Rwanda [2]. Similarly, recent literature indicates the use of FP among HIV infected women has remained low [9, 46, 88]. In addition, previous reports indicated that twenty five percent of women with HIV worldwide and the significant nimber of married women from sub-Saharan Africa have unmet need for family planning [89].

Furthermore, HIV positive women are at risk of unplanned pregnancies [16]. Worldwide, two in every five pregnancies are unplanned [17]. Previous studies of 42 sub- Saharan Africa countries, 10-65% of women reported that their last pregnancy had been unplanned [18]. Similarly, 62% of women on ART from South Africa [19] and 59% of HIV positive women from Kenya reported unplanned pregnancy [20]. Globally, almost 90 million women have an unintended pregnancy each year, largely due to an unmet need for FP [90]. Providing FP to women in developing countries who have an unmet need for modern methods would prevent 54 million unintended pregnancies, including 21 million unplanned births, 26 million induced abortions (of which 16 million would be unsafe) and seven million miscarriages; this would also prevent 79,000 maternal deaths and 1.1 million infant deaths [90]. In Sub Saharan Africa, the unintended pregnancy rate is estimated to be 20–40%, but only 21% of partnered women are using modern contraception and an estimated 20–35% of women have an unmet need for contraception [18].

Contraceptive use saves women's lives and improves their health by allowing women to avoid unwanted and poorly timed pregnancies. Contraceptive use saves children's lives by allowing parents to delay and adequately space births; when births come too early or less than two years apart, the health of infants and their siblings are endangered. Contraceptive use also helps to empower women by allowing them to decide the number and spacing of their children; this, in turn, provides opportunities for participation in educational, economic, and social activities. At the same time, measures to improve women's status, coupled with access to family planning and other key reproductive health services, are likely to result in the most rapid improvements in health and well being [45]

However, unintended pregnancy is a common problem in both HIV positive and HIV negative women. A study conducted in Swaziland has indicated that the rate of unwanted pregnancy was 20.7% [91]. Other studies also indicated that the rate of unintended pregnancy is also high among HIV positive women [85]

Methods of contraception practiced today include “modern” and “traditional “ones. The former refers to clinic and supply methods such as voluntary surgical sterilization, the IUD, oral contraceptives, implants, injectables, condoms and vaginal barrier methods. The main traditional or non-supply methods are periodic abstinence and withdrawal [92-94].

Modern contraceptive methods, namely, female sterilization, intrauterine device (IUD), oral contraceptives, condom and injectables are the most widely used methods among married women in developing countries [95].

People living with HIV (PLWH) do have different contraception options to use while they are on ART. A study conducted in Nigeria revealed that of 340 respondents, only 65(19.4%) of them used condoms [23] and use of hormonal contraceptives up to 70% during the first month after delivery was reported among Kenyan women [96]. The Uganda cohort study showed, of 711 only 14% of women used permanent or semi-permanent family planning methods by their second year on ART. Younger age, not having used condoms consistently for the last 3 months (HR=1.79, 95% CI: 1.02–3.13) were independently associated with pregnancy [97]. A study from South Africa indicated that 86% of ART users and 82% of ART-naïve women reported using contraception. ART users were non-significantly more likely to use contraception compared with ART-naive women (AOR: 1.55; 95% CI: 0.84-2.88). Similar patterns held for specific use of barrier (primarily male condoms), permanent, and dual contraceptive methods [43]. However, study from Uganda reported that women receiving ART were more than twice as likely to use contraceptive methods (AOR: 2.64; 95% CI: 1.07-6.49) and more than 3 times as likely to use barrier contraceptive methods (AOR:3.62; 95% CI:1.54- 8.55) than were women not receiving ART [6].

Previous studies from different parts of Ethiopia reported that of those who have ever used at least one contraceptive method after HIV diagnosis, condom, injectables and abstinence were reported to be the most preferred methods [53-55].

A study done in Addis Ababa, reported that 43.3% of the respondents ever used at least one contraceptive method after HIV diagnosis. Among the contraceptive choices, condom and abstinence accounted for 65.8% and 21.1% after HIV diagnosis respe ctively [54]. Another study in the same area showed that, of 421 subjects, 246 (53.5%) positives were using and 85% want to use family planning in the future [52]. Condom and injectable were the most preferred methods of family planning after HIV diagnosis [52, 54]. There are various reasons why HIV positive women would decide to use family planning and which method to use. An in-depth interview done in Kenya among 24 HIV positive women, 20 said that they would use family planning because family planning providers selected for them [98]. On the other hand, others want to use family planning because they are HIV positive or marked deterioration in their health condition. The major reason for not using family planning was fear of side effects [98], associated with lack of knowledge, communication gap between providers and lack of condom approval [99].

In general, studies elsewhere from African countries have revealed that in addition to ART, numerous behavioral and contextual factors interact in a complex way to determine intended reproductive outcomes among women living with HIV [6, 13, 74, 100]. Age, marital status, educational status and socio economic status, cultural and religious beliefs, sexual behavior as well as family size and loss of a child due to HIV and access to family planning services are documented to be predictors of pregnancy intentions. These factors may be considerably influenced by the traditional roles of women, the socio-cultural importance of motherhood and partner desire for having children and risk of mother to child transmission (MTCT) of HIV [100].

Based on the literature review, the following conceptual frame work (Figure 1) was developed which covers community level factors, individual, HIV related factors, and health related factors

affects on the perception and practice of HIV positive women on their fertility and contraceptive preferences.

1.5. Conceptual framework of the study

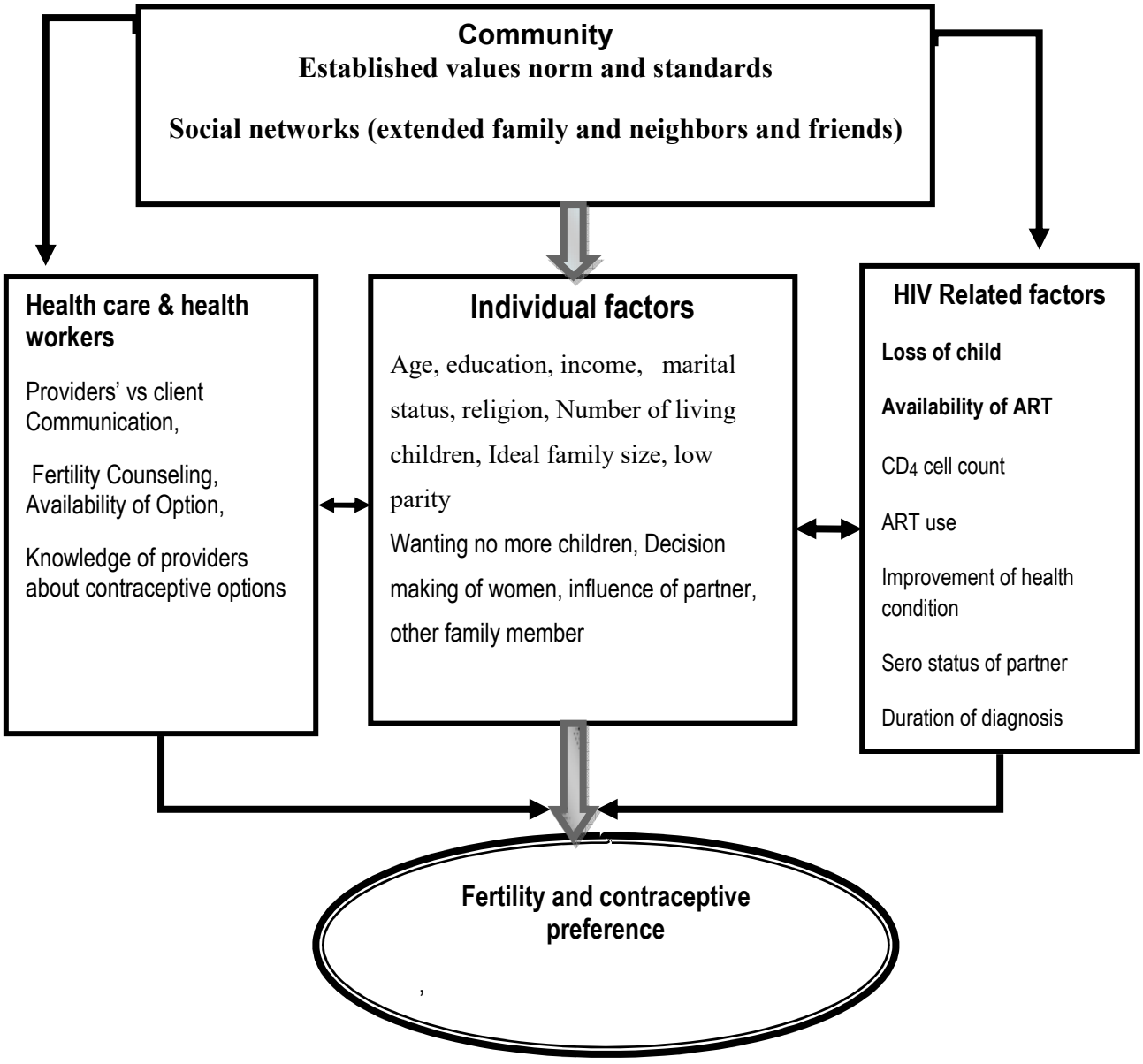


Figure 1: Conceptual framework for effects of fertility intention and contraceptive use among HIV positive women, Addis Ababa, Ethiopia, 2012

(*Source*: partially adopted from [101] Kaidea et.al, 2006)

1.6. Research Questions

After in-depth review of the available litirature on fertility and contraceptive use of HIV positive women globally, regionally and nationally in line with the conceptual fram worke and objectives of the study, several key gaps were identified. Hence, the following questions were formulated.

1. What is the magnitude of fertility intention among HIV positive women in the study area?
2. Do the contraceptive use and method preference of ART users differ from ART naïve women in the study area?
3. Is there any change on fertility intentions 12 months after ART initiation?
4. How does/Are the fertility and contraceptive decision making of HIV positive women affected by their perception, experience or communication with providers?

2. OBJECTIVES

2.1. General objective

To assess the effect of ART on Fertility intentions and contraceptive use of HIV positive women in Addis Ababa, Ethiopia

2.2. Specific objectives

1. To assess the magnitude of fertility intention of HIV positive women attending health institutions, Addis Ababa, Ethiopia
2. To assess contraceptive use and method preference of HIV positive women attending health institutions in Addis Ababa, Ethiopia.
3. To assess changes in fertility intention 12 months after ART initiation of HIV positive women in Addis Ababa, Ethiopia
4. To assess fertility and contraceptive decision making and their perception about the support given by health care providers.

3. METHODS AND MATERIALS

3.1. Study area and setting

3.1.1. Description of the study area and population

Addis Ababa is the Capital City of Ethiopia and the seat of the African Union (Figure 2). As a Chartered City, Addis Ababa has the status of both a City and a State. From its lowest point, around Bole International Airport, at 2,326 m above sea level in the southern periphery, the city rises to over 3,000 m in the Entoto Mountains to the north [102]

Addis Ababa has a total population of 3,048,631, of whom 1,595,968 were females and 1,452,663 males; with annual population growth rate of 2.1% and male to female ratio in the city is 0.91:1 [103], all of them are urban inhabitants. According to CSA, 2012, about 94.3 percent of males are literate while the proportion of literate females is 80.0 percent [5].

Languages spoken in Addis Ababa include, Amharic (71.0%), Oromiffa (10.7%), Guragna (8.4%), Tigrigna (3.6%), Silt'e (1.8 %) and Gamo (1.0%). In Addis Ababa, Orthodox Christian is the predominant religion, 74.7%, followed by 16.2% Muslims, 7.77% Protestants and 0.48% Catholics [104]. The City is classified in to ten sub-cities which are the second level administrative units, followed by weredas, the lowest level administrative units. Addis Ababa has 10 sub cities and 116 weredas. Each sub-city is expected to serve a total population of 300,000 and each Wereda for 30,000 [105].



Source: http://en.wikipedia.org/wiki/Addis_Ababa

N.B. 1. Addis Ketema, 2. Akaki Kality, 3. Arada, 4 .Bole, 5. Gulele, 6. Kirkos, 7. Kolfe Keraniyo, 8. Lideta, 9. Nifas Silk Lafto, 10. Yeka

Figure 2: Map of study setting, Addis Ababa, Ethiopia, 2013

3.1.2. Health services in Addis Ababa

A total of 11 government owned hospitals and sixty two health centers and a number of private health facilities are providing health services in the City [106]. The Health facility to population ratio in Addis Ababa is 1:283,818 and 1:50,355,for hospitals and health centers respectively [67].

Currently, a total of 58 health facilities of different categories are offering ART [67]. The total fertility rate (TFR) of Addis Ababa is 1.5 children per woman, much less than the urban average 2.6 children per woman [103] and the national average 4.8 children per woman [67]. The level of contraceptive use among general women in Addis Ababa was also 63% [2].

3.1.3. Antiretroviral therapy service in Addis Ababa

Fee based antiretroviral treatment began in 2003 and free ART was launched in 2005 [65, 107]. Both public and private health institutions have been offering ART services in the City. By the year 2010, a total of five public hospitals, twenty five health centers, one clinic and thirteen private hospitals were offering ART [108], but currently, 58 health facilities with different categories are offering ART [106]. A total of 144,035 positives are enrolled, 89,031 ever started and 63,108, currently on ART in Addis Ababa [67]

The data sources for this research were health institutions in Addis Ababa for the following reasons: (1) being the first to start ART service, (2) having higher number of people enrolled for ART than all other sites in the country, (3) having high number of transferred cases and (4) data records being in better condition and more retrievable than in other sites.

3.2. Study designs

Both cross sectional and follow up study designs with qualitative and quantitative research methods were applied depending on the specific objectives of the study.

(I) To assess fertility intentions of women with HIV, an institution based cross sectional survey was applied, (II) to assess contraceptive use and methods preference of women, a facility based comparative cross sectional study was employed, (III) in order to assess change in fertility intentions of HIV positive women, a facility based follow up study comparing intentions before initiation of ART and 12 months after ART initiation was done.

For the **qualitative part** (FGDS, IDIs and KIIs) with thematic content analysis were employed. The qualitative study was used to describe and interpret the experiences of clients and their providers in order to understand the existing situation and their recommendation.

3.3. Source and study population

3.3.1. Source population

Women living with HIV (WLWH) and attending health institutions constituted the main source population of the study. The qualitative part also included health care providers directly involved in care and support of people living with HIV in selected public health facilities of Addis Ababa.

3.3.2. Time frame of the study

The descriptive part was conducted from June to October, 2012, the follow up study was conducted from June, 2012-October, 2013 and the qualitative survey was conducted in October and December, 2013.

3.3.3. Study population

Study population were HIV positive women 18-49 years old who were receiving care and support from selected public health institutions (hospitals and health centers) during a data collection period (**objective 1-II**). For the follow up study, newly ART initiated and ART naïve HIV positive women were involved (**objective III**). For the qualitative part, HIV positive women getting service from selected health institutions and providers involved in the care and support of positive women were the participants **(objective IV)**.

3.3.4. Inclusion and exclusion criteria

3.3.4.1. Inclusion criteria

For the quantitative part, HIV positive women with known sero status, age range between 18-49 years, sexually active in the previous 3 months prior to the data collection, currently non pregnant, no history of tubal ligation or hysterectomy were eligible. For the qualitative part, HIV positive women receiving care, and health workers directly involved in care and support activities to those women were eligible.

3.3.4.2. Exclusion criteria

HIV positive women mentally unstable, seriously sick and unable to communicate, difficulty of hearing, and those who did not come to health institution or did not start care and support from health institutions and HIV positive men in general were excluded.

3.3.5. Sample Size Determination

Sample size calculation for the quantitative part was based on probability methods with certain assumptions. For the qualitative part, purposive sampling was employed, with consideration of information saturation.

3.3.5.1. Sample Size (Objective I)

Sample size was determined using the single proportion formula:

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

Where Z is the percentile of the standard normal distribution, P is expected prevalence, and **d** is the desired precision**,** with the assumption of fertility desire of HIV positive women being **44.7%** [54]. With 5% level of significance, a design effect of 2 and an addition of 10% non response rate. With those assumptions, StatCalc application of Epi Info 3.5.1 was used for calculation. Ultimately, the minimum required sample size was 806. However, the total sample size calculated for comparison purposes was **1924**. As large sample size increases the precision of the findings by reducing the level of sampling error [109], we took 1924 HIV positive women.

3.3.5.2. Sample Size (Objective II)

For the comparative study, the sample size was calculated using the following two- population proportion formula.

$$n_1 = \frac{\left[Z_{\frac{\alpha}{2}} \sqrt{\left(1+\frac{1}{r}\right) P(1-P)} + Z_{\beta} \sqrt{P_1(1-P_1) + \frac{P_2(1-P_2)}{r}} \right]^2}{(P_1 - P_2)^2}$$

In the formula, Zα/2 correspnds to the confidence level, Zβ correspnds to power of the study, r is the allocation ratio of ART users and non users; P_1 is proportion in "ART users" and P_2 is proportion in "ART naïve". With the assumption that proportion of contraceptive use among HIV positive women receiving ART and ART naïve being 86% and 82%, respectively [43], the computation was made via StatCalc application of EPI Info version 3.5.1 with minimum detectable odds ratio of 2 at 5% level of significance (two-sided), a power of 90% and a one to one allocation ratio of the two groups (ART users in one group: ART naïve in another group). In addition to those, some 5% non-response, design effect of 2 was considered. Finally, a total sample of 1924 positive women was considered.

3.3.5.3. Sample Size for follow up study (Objective III)

The adequate sample size for investigating change in fertility intention 12 months after ART initiation (follow up study) was also assessed using the aforementioned double population formula. Sample size was computed with the assumption of proportion of fertility intentions among HIV positive women who were ART naïve and 12 months after ART initiation being 26.6% and 21.5% respectively [69], with a minimum detectable odds ratio of 2 at 5% level of significance power of 80% , a one to one allocation of both groups and addition of 20% non response rate. Stat Calc application of EPI Info version 5.3.1 was used for calculation and a total sample size of 407.

3.3.5.4. Sample Size for Qualitative Part (Objective IV)

Focus Group Discussions (FGDs) and in depth interviews (IDIs) were conducted among HIV positive women and key informant interviews (KII) have also conducted among health care providers at different sites to explore the contextual issues related to fertility, contraceptive decision making, available support and experience of clients and health care providers.

Purposive sampling technique was used to select total of 4 FGDs with HIV positive women: who were members of womens support groups, adherence supports and attendants of ART units. There were 14 IDIs with HIV positive women working as peer educators, mother support group

and 10 KIIs with health care providers. However, the maximum number of FGDs, IDIs and KIIs was estimated by saturation of information.

3.3.6. Sampling Methods

3.3. 6.1. Descriptive cross sectional survey

Respondents were selected principally using a multi-stage sampling technique using client registration books as the sampling frame. Initially, unique identification number was given to each health institution. Secondly, a total of five hospitals and seven health centers were selected by lottery method. Thirdly, the average number of clients who visited the ART units daily during data collection period was estimated based on the previous daily client flow of the units. The proportion allocations were carried out according to the patient load in each institution. Systematic random sampling was used to select the study subjects from the selected ART sites (Figure 3).

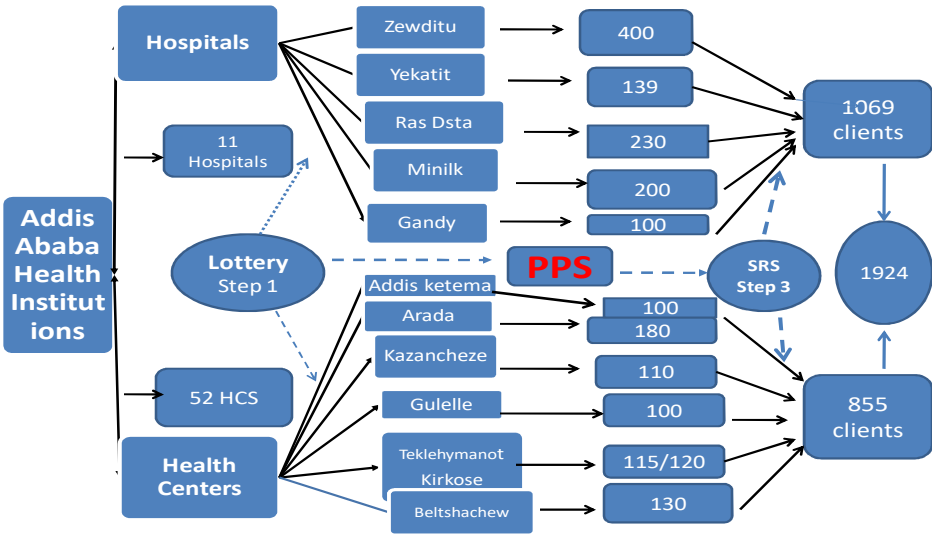


Figure 3: A schematic presentation of sampling procedure for Fertility intentions, contraceptive use and preference, Addis Ababa, Ethiopia, October 2013.

3.3.6.2. Follow-up design

Participants for the follow up study were different from women enrolled in the cross sectional surevy (Objective I & II). Eligible women who came to the follow up and ART initiation were given identification numbers. Newly ART initiated women were selected sequentially, while every third ART naïve woman was selected using systematic random sampling.

A total of 5678 (men and women) were receiving care at the selected sites, of those, 3118 were women of reproductive age. About 407 women were eligible of whom 360 women (including 190 ART initiated and 170 ART naïve) participated (Figure 4).

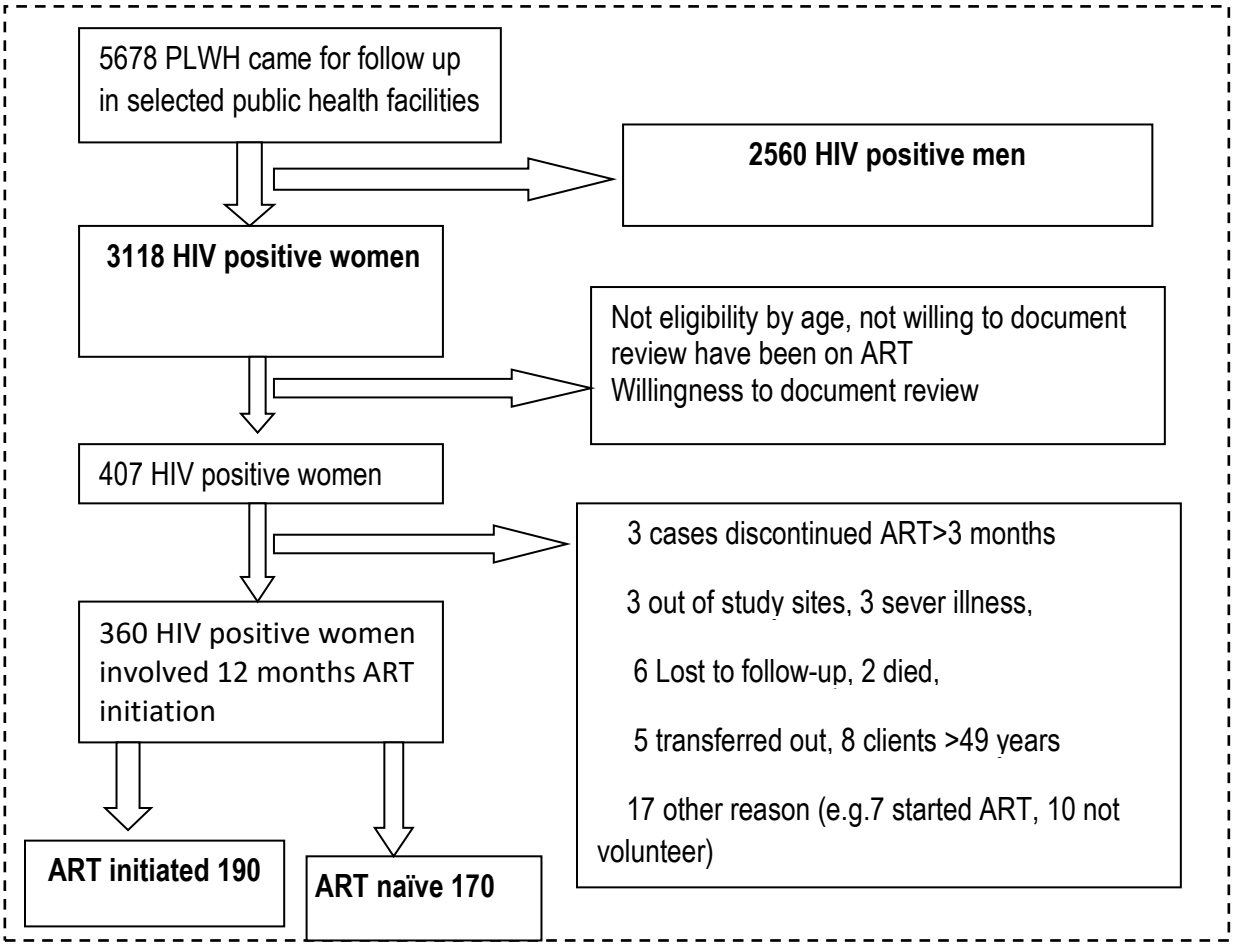


Figure 4: Schematic representation of women enrolment and flow chart for change in fertility intention study in Addis Ababa, Ethiopia, 2014

3.3.6.3. Qualitative study

The participants were selected purposively and potential participants were identified at the time of clinic visit. Wide ranges of sources of information were included in FGD, IDIs and KIIs. The participants were HIV positive women on ART and ART naïve, mother support group, peer educators and adherence supporters as well as health workers serving for PLWH. The potential participants were invited to a private room and health workers were introduced with study interviewer, who provided a brief description of the study. Interested clients received and completed participation information. The numbers of discussions was determined by information saturation.

3.4. Data Collection, Processing and Analysis

3.4.1. Data collection tools

The data collection tool for the **quantitative part** was an interviewer administered structured questionnaire adapted from previous studies [33, 43, 69, 110]. The English version was translated into the local language (*Amharic*) by two experts who are fluent in both languages, then back to English by another person to ensure the consistency of the instrument. Five percent of the questionnaire was pre tested in another health institution having similarity to the study population. Then, some words were modified/ contextualized and few questions were rephrased (Annex 2).

For the qualitative part: Semi structured interview guide for focus group discussion, in depth interview and key informant interviews were developed in English by the principal investigator and translated in to Amharic by experts' who are fluent in both languages and back translated to English to check its consistency. Important concepts and points for development of the questionnaire were derived from published articles [74, 111], and adapted to the local context. Tools were prepared by considering the culture, values and language of the study subjects. It was pre-tested by conducting two FGDs of 9 participants each, 3 IDIs and 2 KIIs at randomly selected institution out side the actual study site, but with similar socio-demographic

characteristics for validation of the instrument and found not to have major problems. The pretest contributed to improve clarity in wording, sentence construction and developing probing questions.

3.4.2. Data collectors

For the quantitative data collection, 25 female diploma nurses were recruited from the study area. They were selected based on their level of education, previous experience in data collection, knowledge of local language, culture and additional training on ART, VCT and care of PLWH. Adequate training was given for five consecutive days by the principal investigator focusing on the contents of the questionnaires, sampling methods, interview technique, quality of information, ethical issues and safety of the participants and confidentiality.

All data collection procedures were closely supervised by two trained supervisors (nurses with qualification of MSc, with consideration of additional training and experience) and the principal investigator.

For the follow up study, five female data collectors were reselected from those who participated in the previous data collection and were further trained for three more days.

For the qualitative part two moderators (MSc. nurses, currently working at Addis Ababa University) together with PI and two note-takers (who had exposure to similar data collection activities) were selected and trained for three days.

3.4.3. Data Collection Procedure

3.4.3.1. Descriptive survey

The data were collected June-October, 2012**.** After determining eligibility and consent, participants received 30-35 minutes interviewer administered questionnaires in separate rooms. The daily average numbers of clients who visited the ART units during data collection period were estimated based on the previous daily client flow of the units. This was obtained by

referring to client registration book (recorded for one month prior to data collection). About 50% of subjects who visited each site daily were interviewed. The data collection process was closely supervised.

The questionnaire assessed socio-demographic characteristics; HIV/AIDS history, diagnosis, and treatment; sexual, fertility desires, intention of the women/husband /partner and number of live children. Medical record review was conducted to confirm ART history and obtain clinical data, including World Health Organization stage of disease and CD4 cell count. The medical record review was considered to cross check for inconsistencies between self-reported and medical record data.

3.4.3.2. Follow-up study

The follow up study was undertaken from June 2012 to October, 2013. The data were collected using interviewer administered structured questionnaire. The study was linked with the routine activities of each health institution. The participants in the follow up study were different from those involved in descriptive (Paper I-II) or qualitative part (Paper IV). The **recruitment procedure** was conducted using appointment log book and screening was conducted every day.

Follow up procedure: the follow-up for both groups (women on ART and ART naïve) was scheduled in line with the respective institutional schedule for two times over a period of one year. ART initiated women were interviewed during refill (treatment collection) and ART naïve women were interviewed during their appointment for CD4 cell testing. The same tool was used both times and collected identical information to the baseline, except socio demographic factors and WHO stage of disease that cannot change over time. For ease of follow up, a unique identification mark labeled (Annex 1: Figure 7) with date of baseline survey and the schedule of next appointment was labeled on patient's history book and questionnaire collected as a baseline data (Annex 1: Figure 8). A study staff reminded them the next interview time when they collected their drug or came for other follow ups.

Tracking procedure: During the baseline interview, the contact details of each participant (cell phone, other contact address e.g. relatives or friends cell phone, including unique ART number,

next appointment schedules) were recorded (Annex 1. Figure 9-11). In addition, detailed direction of patient's home, place of work or other convenient places were recorded. Every effort was made to minimize loss to follow-up. For example, if a woman missed her appointment, phone contact was done, home visiting for interview was done for those who were willing to be visited at home, or another convenient appointment time or place was made
When the client was not traced for 3 months either by four calls and/or one home visit and failed to trace the home or found that she is relocated to an inaccessible place, then she was considered as lost to follow up.

3.4.3.3. Data collection procedure for qualitative study

Four FGDS, 10 IDIs and 7 KIIs were conducted. On average 9 participants were involved in each FGD with minimum 8 maximum 12 took part in each discussion that lasted for about 45 minutes to 1 hour. A total of 10 IDIs were conducted among HIV positive women. A total of six nurses and one health officer participated in the key informant interview.

The potential participants were invited to a private room and health care providers have introduced to the study interviewer, who provided a brief description of the study. As the discussion was conducted along with their clinical attendance no stipend was given to participants

The discussions were facilitated by the principal investigator together with two moderators and assistants were involved to capture non verbal cues and other non recordable issues. The discussions were conducted in private and quiet rooms in separate offices attached within each ART sites where the moderator and the note taker were present. The discussions were facilitated by raising open ended questions then followed by probing questions. Instead of personal identifiers, the discussants were given identification code numbers in the order of their seats for note taking and confidentiality purpose.

After some introductory remarks like self introduction, explaining the purposes of the focus group, laying down some basic ground rules to encourage everyone to participate in the discussion, reassuring the participants about the voluntary and confidential nature of their

participation and consent was obtained, the interviewers asked the participants for their opinions and perceptions about fertility and contraceptive preference and perception about support given by health workers and health workers view about such issue. All the FGDs, IDIs and KIIs were tape-recorded and hand-written notes were taken. The discussions were conducted in private, ventilated and well of room. For privacy and safety of the information, all documents were kept safely in a locked drawer.

3.4.4. Study variables and Measurements

3.4.4.1. Dependent Variables

For the descriptive cross sectional survey the dependent variables were fertility **intentions, method preference** and **contraceptive use**

For follow up study: **change in fertility intention**

For qualitative part: perception and experience of clients and providers towards the available support, fertility and contraceptive decision

Explanatory variables: primary ART use, secondary HIV status of women.

3.4.4.2. Independent Variables

Socioeconomic Factors: age, education, income, religion, marital status, ethnicity

Serostatus and ART Related Factors: disclosure of serostatus to partner, sero-discordance, desire of partner, duration of marital relation, health condition of the women, CD4 cell count, WHO clinical stage of disease.

Facility Factors: information regarding options and fertility counseling, availability of the methods, integrated service in ART units.

Relationship factors: familyinfluence, partner influence, value for the children, social networking, and stigma attached with.

3.4.5.2. Measurements

The set of dependent and independent variables vary across the objectives of the thesis. However, variables that are theoretically and empirically related to fertility and contraceptive use and preference of HIV positive women were taken as independent variables. Those included age,

religion, marital status, education, employment, monthly income, current sexual partnership status, number of living children, and HIV clinical variables including, recent CD4 cell count, nadir/ lowest CD4 cell count, WHO clinical stage of disease and ART use status

To assess fertility intentions of HIV positive women, the primary outcome variable for the study was **self-reported fertility intentions**, which was defined by answers to the question: "Are you currently planning to have (more) children in the future?" Women were free to respond "Yes", "No", or "Don't know, the small proportion of women who responded "Don't Know" (less than 5%) were included in the "No" category. There was little difference in the proportion of women reporting "Don't know" by HIV and ART use status. Variables known to be associated with fertility intentions were included in the analysis to provide an adjusted estimate of the association.

Covariates included were age, religion, marital status, education, employment, monthly household income, current sexual partnership status, number of living children, and HIV clinical variables including, recent CD4 count, nadir CD4 count, and WHO stage of disease. Medical record review was also conducted to confirm ART history and obtain clinical data, including World Health Organization stage of disease and CD4 cell count.

Antiretroviral therapy (ART) use was defined as use of one of three antiretroviral medications either efaveranze (EFV) or Neverapin (NVP) based first line drugs [6, 43, 65] or use of non nucleotide reverse transcriptase inhibitors (NRTIs) with protease inhibitors (PIs) (leponavir/ritonavir(LPV/r) or atazanavir/ritonavir (ATV/r)) backbone of second line drugs [43].

To assess contraceptive use and method preference of HIV positive women: The primary outcome variable was **self-reported contraceptive use** during the previous six months prior to the data collection period. In this study, contraceptive use was defined as the use of any method including, injectables (Depot), implants (implanon or jadelle), oral contraceptive pill (OCP), intra uterine contraceptive device (lUCD), male/female condom, diaphragm, permanent methods such as, tubal ligation and hysterectomy. Dual contraceptive method was defined as use of primarily the male condom with hormonal or other contraceptive methods like IUCD.

Consistent condom use was defined as the use of condoms always or frequently in all vaginal sexual relationships with casual and/or steady partners. Women who used condoms sometimes or rarely were regarded as inconsistent condom users.
In addition to reporting use of each contraceptive method individually, we collapsed the data into four mutually exclusive groups including, "**Use of dual contraceptive methods**", "**Consistent condom use** only", "**Use of Hormonal/Permanent method only**", and "**Not using any contraceptive method**" and tested for differences by ART use status.

Independent variables in this study included age, education, employment, monthly household income, sexual partnership status, HIV serostatus of partner/husband, number of living children, HIV test of children, disclosure of HIV status to partner/husband and discussion with partner/husband or health workers about contraception. Medical record review was also conducted to confirm ART history and obtain clinical data including World Health Organization stage of disease and CD4 cell count

Antiretroviral therapy (ART) is treatment of people infected with human immunodeficiency virus (HIV) using anti HIV drugs[64]. The standard treatment consists of a combination of at least three drugs often called "antiretroviral therapy" (ART) that suppress HIV replication. Anti retroviral therapy (ART) use defined as use of one of three antiretroviral medications either Efaveranze (EFV) or Neverapin (NVP) based first line drugs [6, 43, 65] or use of combination drugs with protease inhibitors(PIs) backbone of second line drugs [65]. We considered women to be ART users if they had been receiving ART for at least one month and ART-naïve, if they had never taken ART, prior to the data collection period.

To assess change in fertility intentions of HIV positive women: the outcome of interest was evaluated in two visits through the following question: Do you want to have child in the future? Women were free to answer yes, no, or do not know. Fertility intention was determined based on the woman's reports at baseline and on 12 month follow-up visits.

A change in fertility intentions would have occurred if a woman reported wanting no more children at baseline and reported wanting to have more children during the 12 months follow-up visit. Similarly, a change in fertility intentions would have occurred if a woman reported wanting more children at baseline and then reported wanting no more children, undecided or adopting a birth control method at follow-up visits. Whereas, no change in fertility intentions is considered, if a woman reported wanting more children at the baseline and no contraceptive method use and same report at 12 months visit. Similarly, no intention at the baseline and adopting birth control, and similar response given 12 months visit.

The outcome of interest was **self reported fertility intentions** through the following question: Do you want to have child in the future? Concordant response at the baseline and 12 months after follow up were coded as no change (0) and discordant response as change in fertility intentions and coded as (1).

3.4.6. Data Management and Processing

3.4.6.1. Data Management

With regard to data management of **quantitative part**, all completed interview forms were reviewed by a supervisor and inspected/checked by the PI. Forms with missing data or inconsistencies were returned to the interviewers for correction. Dummy tables that consider the main research questions were drafted after designing the questions; the data were categorized and coded on well defined coding sheet. On top of this, the pre-coded responses were double entered in to Epi-Info version 3.5.1 software by trained personnel under continuous supervision of PI.

The data were screened for missing, outlier values and data entry errors using the frequency distributions of the variables and observation of the entered data. Actual and suspected errors were validated against the raw data and the necessary corrections were made before the analysis. In all of the variables, actual missing values were very few and random, so they were left unaltered. Later it was exported to SPSS version 20 soft ware for analysis.

Regarding data processing for the **qualitative** data, the discussion was tape recorded and the recorded data was transcribed in to the same language and translated to English, entered in to open code soft ware then discussed under main thematic areas.

3.4.6.2. Data analysis

The analysis was done using SPSS version 20 software. The descriptive data were presented by using appropriate statistical tables, graphs. Percentage, mean, median was calculated. The magnitude of dependent and independent variables were quantified. To determine the association between the explanatory and outcome variables, those that show significant association at bi-variable analysis ($P<0.05$) were selected and entered one at a time in to the model for further multivariate regression analysis. The analytical part was calculated by controlling confounding factors using univariate and multivariate logistic regression analysis. The strengths and directions of the associated factors were explained (reported) using adjusted odds ratios (AOR), with their respective 95% confidence interval(CI), and p-value of <0.05. Furthermore, the normality of the distribution of continuous variables (like respondents' age was assessed using various options including statistical testes (Kolmogorov- Smirnov and Shapiro-Wilk tests), and visual evaluation of histograms.

The qualitative part: transcription was made for all tape recorded FGDs, IDIs and KIIs; were analyzed along major themes of the research by the principal investigator. Detailed description of data processing for each objective is presented as follows:

For the study of fertility intentions of HIV positive women: the pre coded responses were double entered in EPI Info version 3.5.1 software, cleaned, exported and analyzed using SPSS version 20 software. Strength and direction of the association were presented using odds ratios relative to the reference category and 95% confidence levels. Binary logistic regression analysis was done to assess the relative effect of determinants. Finally, adjustment was made for predictor variables that were significantly related to the outcome variable and only one adjusted result is presented.

For the study of contraceptive use and method preference of HIV positive women measuring contraceptive use: we computed the prevalence of contraceptive use and method preference among our study population, i.e. **contraceptive use between the two groups (ART users verses ART Naïves).** We used appropriate model to measure the strength of the association between ART use and odds of contraceptive use by controlling covariates. The proposed model was ART users and ART-naïve, and allowed for adjustment for HIV-associated clinical characteristics.

Contraceptive uses, preference and reasons for selection of contraceptive methods are presented using descriptive statistics. Variables found to be significant at bivariate level, ($P < 0.05$), were selected and included in to multiple logistic regression models. Then, multiple logistic regression analyses were used to calculate Odds ratio with 95% confidence interval to estimate association and to control the potential confounding variables. Strength and direction of the association between contraceptive use and potential socio-demographic, reproductive health and clinical factors were presented using adjusted odds ratios relative to the reference category and 95% confidence levels.

Change in fertility intentions 12 months after ART initiation:

Data analysis: The pre coded responses were double entered into Epi Info version 3.5.1 and exported to SPSS version 20 for data checking, cleaning and analysis.

We compared baseline characteristics of ART initiated and ART naïve women using McNemar's test for categorical variables. The McNamara's test result shows significant difference between the baseline and 12 months measurement in their fertility intentions (P-value<0.0001 and McNamara's X^2=17). Furthermore, the change in fertility intention was positively associated because change in fertility intention increased from 5% at the baseline to 20% 12 months after ART initiation. Based on these, all concordant (similar responses') were combined together and the discordant (different) responses combined together to form new outcome variable computed in this study

Fertility intention is presented using descriptive statistics. The strength of association between change in fertility intentions and potential socio-demographic, reproductive health and clinical factors were assessed using odds ratios with 95% confidence levels. Logistic regression analysis was done to assess the relative effect of independent variables and fertility intentions and adjusted result is presented.

For fertility and contraceptive decisions and support from health care providers: all discussions were tape-recorded and a note taker was present in all discussions. It was transcribed verbatim in to the language of discussion, Amharic. The transcribed text was given to three of FGD, two IDI and two KII participants to read and check wether all points were properly captured or not. The checked texts were translated to English and back translated to Amharic to see its consistency. To assure the validity of the translation, another person, proficient in both languages checked and commented on it so as to incorporate changes in to the report. The initial step in the analysis was to read through all the transcripts several times, while making notes in the transcript. The notes were reviewed by multiple readers and themes identified and coded, to ensure that all the key themes were captured. The research assistants and investigator used an empirical approach to modify the pre-determined themes. After verifying and reviewing the coded and labeled responses, the authors identified major themes.

The English version of the data entered in to Opencode software version 3.4 for analysis and the codes were grouped into categories in order for themes to be identified [112]. After reading the transcripts, the researcher performed open coding of the texts, constantly comparing similarities and difrences among groups by going back to the original text. In the next step, selective coding was performed and relevant codes were further conceptualized leading to the development of categories. Several categories were taken together to form themes. During the coding process, relevant questions from transcripts were put in to memos and incorporated to illustrate main ideas during write-up. Finally, understanding of multiple forms of information collected and triangulation of different data sources was made to verify the finding.

Then, the themes and subthemes were further identified. This was intended to identify similarities as well as differences in experiences and opinions across various categories of

participants (women, providers, at different health institutions). Further key questions were put in to memos during coding, later they were used to incorporate to illustrate the main ideas during the write up. Quotes and important points presented by the participants were presented along with the qualitative data to give emphasis of the concepts. A qualitative latent content analysis technique was used. The data were therefore, condensed without losing quality (Figure 5)

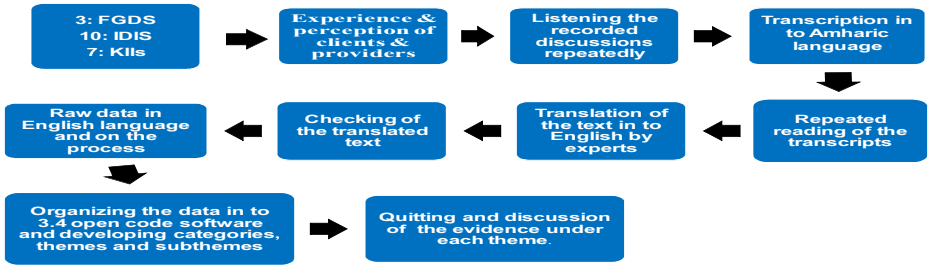


Figure 5: Schematic presentation of data processing of the study participants, Addis Ababa, Ethiopia, December, 2014.

3.4.7. Data quality assurance

In order to maintain quality of the data collection, various methods were employed such as the studies were designed to address the objectives and draw the optimum findings using both cross sectional and follow up study designs. Data collection tools conducted in developing countries were adopted and the tools were prepared by considering the culture, values and language of the study subjects.

Consistent supervision of the data collection processes was done by the supervisors and the principal investigator throughout the data collection period that has further added to the quality of the instrument. Moreover, the quality of the instrument was assured by adequately training data collectors for five consecutive days.

The questionnaires were prepared in the local language for better understanding of the concepts that ensures the quality of the instrument. It was pre-tested in randomly selected health institutions other than the actual study facilities, which has similar demographic characteristics with the study population. Based on the findings from the pre-test, adjustments were made

including, modifications and corrections of inconsistencies of ideas and improving languages. The pre-testing also helped the data collectors to be more familiar with the instrument.

Data collectors, supervisors and the principal investigator had debriefing meetings every evening to evaluate the day's performance, to solve any encountered problems and to plan activities for the following day. The questionnaires were checked for errors, incompleteness or inconsistencies by the research team. Questionnaires with missing data or with inconsistent information were returned to the respective data collectors for correction.

The data collection process was strictly supervised for its completeness. Incomplete data were rejected; both the data collectors and supervisors signed on each covering page specified for this. Double data entry was implemented and backup was set aside in a daily base and the data were put in a secured place locked with a key by the principal investigator.

After completing the entry, the data were screened for missing, out of range and outlier values. The assumption and fitness of statistical methods were checked following standard procedures.

For the qualitative study, a field guide was prepared by the research team based on the conceptual framework with possible probing questions. Randomly selected transcripts and translates were compared with the original records by experts to verify accuracy. With the involvement of multidisciplinary research team, data collection tools were adopted from previous studies and prepared by considering the culture, values and language of the study subjects. The interview was conducted in private, ventilated and well of room.

A good quality of tape recorder was used for recording of the information. The recording level and batteries were checked. The tape record was supported by field note to cross check the information. Verbatim transcriptions and content analytical procedures were used to make the study rigorous. Informative discussants were selected purposively from different categories to enhance triangulation. Independent coders were used and differences were solved through consensus and confirmability was assured by follow-up interviews with participants and member checking [113]. Respondent validation was also done by giving the transcribed texts to

two of the FGDs, three of IDIs and two of the KIIs participants to read and check if points were well captured. Then the texts were translated in to English and entered to open code software.

3.4.8. Ethical Considerations

Ethical clearance was obtained from the Institutional Review Board (IRB) of the College of Health Sciences of Addis Ababa University. Written permission was obtained from the Addis Ababa City Government Health Bureau. Written consent was obtained from health bureaus of selected sub-cities, consent was obtained from chief executive officers, medical directors, case teams and/or matrons and head nurses. In addition, letters of support from woredas and organizations working on the issues were obtained. Verbal consent was also obtained from individual clients. An information sheet containing the general aim of the study, method of the study, responsible individuals and institutions with their addresses and consent form written in local language was attached to the cover of the questionnaires to be read by or to be read to the respondents to obtain individual consent.

During tha data collection process, data collectors informed each study participant about the purpose, duration and anticipated benefits of the research project and the study participants were also informed on their full right to refuse, withdraw or completely reject part or the entire interview at any time. They were assured that their treatment and other benefits they gain from the hospital and/or other organizations would not be influenced by their participation in the study. Finally, they were asked for their informed consent to participate or not to participate in the study and for their willingness on use of their files and records for the study. Interviews were conducted in a private, quiet, ventilated room to respect the study participants' anonymity and boost their confidence on the study. Each piece of information obtained from every responding subject was handled under strictly confidential care locked in separate locker handled by the principal investigator.

The interview and the group/individual discussions were undertaken anonymously. Neither in the quantitative, nor in the qualitative data collection were personal identifiers like names, ID, or telephone numbers used. For the follow up study, means of tracking of the clients was kept

confidential and not indicated on the report. For the FGDs, each participant was given an identification number in the order of their seats and the moderator and the note-taker used these numbers to identify respondents both during note taking and transcription.

Adequate training was given for data collectors on respondents' rights, privacy and confidentiality in HIV and related information and on how to handle and support or when respondents seek clarifications. Data collectors were those who have additional training on counseling and care for PLWH as the study was related to sensitive HIV/Sexual/ reproductive health issues.

In addition to all the information mentioned above, informed consent was obtained in advance from the respective discussants, to record their responses. Notes were taken to be able to capture the interaction between participants. They were also told to switch-off the audiotape, if they feel that there are issues which should not be recorded. At the end of each interview session, general information was given about fertility, contraceptives, ART and condom demonstration was done.

Benefit: The research does not have a short term financial, or any other benefit to the research participant as an individual or as a group, but in the long run it will help the concerned organization and policy makers to design appropriate policy directions and strategy related to fertility and contraceptive need of HIV positives based on the recommendations and the findings. Moreover, the research work will help feedback in the field of HIV and sexual and reproductive health in the area.

Risk: The study did not have inhumane treatment or harm on the participants physical health. However, since they took time to respond and were asked sensitive issues, minor social or psychological harms could have occured. In that regard, explanation was given, in advance, on the objectives of the study and their participation was only with their full will. Based on that, they consented to participate. In general, Table 1 showes the summry of the methods applied in this dissertation.

Table 1: Summary of study methods corresponding with study objectives, design, study population and samples size, Addis Ababa, 2014

Objectives	Setting	Design	Data collection method	Study population	Sample size	Data Analysis
Objective I. fertility intentions	Health facility	Cross sectional Descriptive	interview questionnaires and document review	HIV positive women	**1924**	Descriptive bivariate , multivariate analysis
Objective II. Contraceptive use &method preference	Health facility	Cross sectional comparative study	interview and document review	HIV Positive women on ART and ART Naïve		Descriptive bivariate multivariate analysis
Objective III. Change in fertility intention	Health facility	Prospective follow up study	interviews administered questionnaire	HIV +ve women ART initiated& ART naïve	**407**	Bivariat and multivariate analysis
Objective IV. Fertility and contraceptive decision and perception	Health facility	Qualitative explorative	FGDS, IDIs & KIIs)	HIV + women, and HCW*	**4-FGDs 10 IDIs 7 KIIs**	Thematic content analysis

N.B. *Health Care Workers, FGD: Focus Group Discussions, IDISs: in depth interviews, KIIs: key informant interview

4. RESULTS

4.1. Fertility intentions of HIV positive women

4.1.1. Socio-demographic characteristics of study participants

A total of 1924HIV positive women were approached for participation. Of these, 69 (3.6%) questionnaires were excluded from the analysis for incompleteness and inconsistence of responses. Therefore, the analysis was based on 1855 HIV positive women. Those consitituted 823(44.3%) ART users and 1032 (55.7 %) ART naïves with response rate of 96.4%. Five hundred forty six (29.4%) were in the age range of 30-34 years. The mean age of the respondents was 31.3 $\pm$5.6 SD years.

The study participants were predominantly Amhara 1104(59.5%) and Orthodox 1461(78.8%) by their ethnicity and religion respectively. Concerning marital status about 50% of the participants were currently married and 19.5% were single. Six hundred eighty nine (37.1%) of the participants have completed grade 1-8, followed by those who completed grade nine to twelve 599(32.3%). Three hundred seventy nine (27.4%) were unemployed and 509(20.5%) reported working in private business. Five hundred twenty two (28.1%) reported to have no monthly income at all and 509 (27.4%) were getting monthly income of less than 500 Ethiopian Birr (equivalent to 27.8 USD at the period of data collection) (Table 2).

Table 2: Socio-demographic characteristics of HIV positive women aged 18-49 years in Addis Ababa, Ethiopia, (n=1855)

Characteristics	Frequency (%)
Age(years)	
18-24	189 (10.2)
25-29	522 (28.1)
30-34	546 (29.4)
35-39	421 (22.7)
40-49	177 (9.5)
Ethnicity	
Amhara	1104 (59.5)
Oromo	420 (22.6)
Gurage	165 (8.9)
Others(Tigrea, Siltea, Gamo, welayta,yem,worji)	166 (8.9)
Religion	
Orthodox Christian	1461 (78.8)
Muslim	197 (10.6)
Others (Protestant, catholic, Jubbah)	197 (10.6)
Marital Status	
Single	361 (19.5)
Married/cohabited	945 (50.9)
Widowed	283 (15.3)
Divorced	266 (14.3)
Educational status	
illiterate	243 (13.1)
Informal education	150 (8.1)
Grade 1-8 completed	689 (37.1)
Grade 9-12 completed	599 (32.3)
above 12 grade	174 (9.4)
Occupation	
unemployed	379 (20.5)
Housewife	342 (18.4)
Daily laborer	279 (15.0)
Merchant	100 (5.4)
Commercial sex workers	34 (1.8)
Government worker	212 (11.4)
Private Business	509 (27.4)
Monthly income (in Birr)*	
No Income(dependent)	522 (28.1)
Birr below 500	509 (27.4)
Birr 500-1000	521 (28.1)
Birr 1001-3000	258 (13.9)
Birr above 3000	45(2.4)

**1USD: 18 Birr (currency of Ethiopia at the time of data collection)*

4.1.2. Fertility intentions and clinical characteristics of study participants

Eight hundred fifteen (44%) women reported that they intended to have (more) children in the future irrespective of their ART use. One thousand sixty two (57.3%) women reported ever had sexual partner. Eight hundred sixty four (81%) women reported that their sexual partner/husband had been tested for HIV of whom 630(73%) reported that their partners were positive; while 217(25%) reported that their partners were negative.

Five hundred eighty nine (32%) and 810(33%) women have 200 to 350 recent CD4 count and nadir CD4 count respectively. One thousand six hundred fifty five (89.2%) women had disclosed their sero-status to someone else, but the remaining 200(10.8%) had not. Of those who disclosed, 906 (85%) reported the disclosure of their sero-status to sexual partner/husband, but, 140(13%) did not disclose their sero-status to their sexual partner. Six hundred and five (32.6%) women reported having one child followed by 408 (22.0%) two children and 558(30.1%) no children (Table 3).

Table 3: Fertility intentions and clinical characteristics of HIV positive women aged 18-49 years in Addis Ababa, Ethiopia, 2014. (n=1855)

Fertility intentions and clinical characteristics	Freq. (n= %)	Fertility intentions and clinical characteristics	Freq. (n= %)
ART use(n=1855)		**Recent CD4 count(n=1855)**	
Yes	823(44.3)	Less than 200	268(14)
No	1032(55.7)	200 to <350	589(32)
Fertility Intention(n=1855)		350 or greater	998(54)
Yes	815(44)	**Nadir CD4 Count (Lowest)(n=1855)**	
No	1040(56)	Less than 200cell/mm^2	785(42)
Have sexual partner(n=1855)**		200 to less than 350cell/mm^2	810(33)
Yes	1062(57.3)	350 and above	460(25)
No	793(42.7)	WHO Stage of Disease(n=1855)	
Partner Tested(n=1062)		Stage I/II	1096(59)
Yes	864(81)	Stage III/IV	759(41)
No	104(10)	Disclosed HIV status to someone else n=1855)	
Do not know	94(9)	Yes	1655(89.2)
HIV status of partner(n=864)		No	200(10.8)
Positive	630(73)	Disclosed HIV Status to husband /partner(n=1062)	
Negative	217(25)	Yes	906(85)
Do not know the status	17(2)	No	140(13)
Ever lost a child by HIV (n=1297)		No response	16(2)
Yes	45(3)	Number of Living Children(n=1855)	
No	1228(95)	0	558(30.1)
Do not know the cause	24(2)	1	605(32.6)
		2	408(22.0)
		3+	284(15.3)

** ***Sexual partner**: marital and extramarital relations*

4.1.3. Reasons to continue childbearing

There were a wide range of reasons why women intended to have additional children as shown in (Figure 6). Four hundred thirty seven (53%) women reported as a result of the presence of ART, followed by improvement of health condition 145(18%). Other reasons mentioned were influence of husband/partner 70(9 %), like children as they are gift of God 41(5%), advice of health workers 37(5 %), to reach ideal family size 34(4%) and the like.

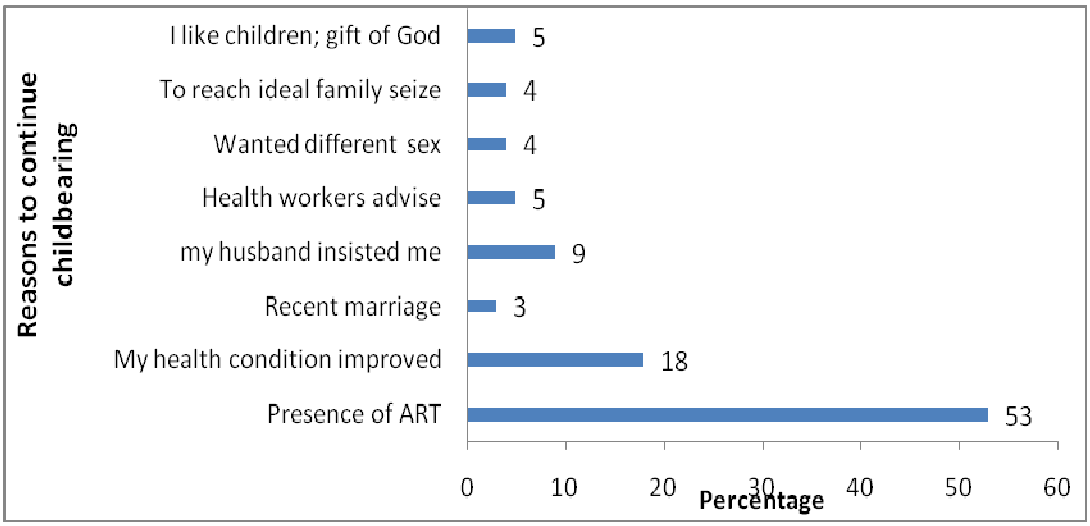


Figure 6: ***Reasons to have children in the future among positive women, aged 18-49 years in Addis Ababa (n=815)***

4.1.4. Factors associated with fertility intentions

ART users had higher fertility intention (AOR; 1.26, 95%CI; 1.01 to 1.60) than ART naïve. Women in the age range of 40-49 years (AOR; 0.14, 95%CI, 0.08 to 0.24), age range 35-39 (AOR, 0.46; 95%CI, 0.31 to 0.66) and age range 30-34 (AOR, 0.60; 95%CI, 0.42 to 0.84) were respectively less likely to report fertility intention in comparison to younger women in the age range of 18-24 years (Table 4).

Marital status has also an association with fertility intention in with divorced (AOR, 0.59 95%CI, 0.42 to 0.83) and widowed women (AOR; 0.26; 95%CI; 0.18 to 0.39), respectively having less fertility intention than single women. However, no significant association with fertility intention was found between married/cohabited and single women (AOR; 1.10, 95%CI; 0.34 to 1.41). Women who completed grade eight (AOR, 1.62, 95% CI; 1.15 to 2.27) and those who completed grade 12 and above were two times (AOR; 2.16; 95% CI; 1.32 to 3.53), respectively, more likely to have future children than illiterate women.

Fertility intention also declines with number of children women have. The odds of fertility intention for women who have one child (AOR, 0.34, 95%CI, 0.26 to 0.44), women who have two children (AOR; 0.08, 95%CI, 0.06 to 0.11) and women with three or more children (AOR: 0.30, 95%CI; 0.02 to 0.06) than women with no children, respectively. HIV test of the partner has an association with fertility intention, women who do not know whether their partner have

taken HIV test or not were less likely to report fertility intention (AOR, 0.44; 95%CI; 0.25 to 0.78) than women who knew the test of their partner, while women who are living with partner who did not test at all were equally likely to report fertility intention. The finding also revealed that women currently in a sexual relationship were less likely to report fertility intention (AOR, 0.46, 95%CI, 0.25 to 0.48) than women who did not report presence of sexual relationship with partners (*Table 4*).

Table 4: Adjusted analysis of variables associated with fertility intentions among HIV positive women aged 18-49 years in Addis Ababa; 2014 (n=1855)

Variables	Fertility Intention		Odds ratio(95%CI)
	Yes	No	AOR(95%CI)
ART Use			
ART- naïve	339(41.6)	484(46.5)	1.00
Receiving ART	476(54.4)	556(53.5)	1.26(1.01-1.60)**
Age (years)	N (%)	N (%)	
18-24	112(13.7)	77(7.4)	1.00
25-29	284(34.8)	238(22.8)	0.81(0.57-1.15)
30-34	245(30.1)	301(28.9)	0.60(0.42-0.84)*
35-39	151(18.5)	270(26)	0.46(0.31-0.66)
40-49	23(2.8)	154(14.8)	0.14(0.08-0.24)
Marital Status			
Single	190(23.3)	171(16.4)	1.00
Married/cohabited	485(59.5	460(44.2)	1.10(0.34-1.41)
Widowed	47(5.8)	236(22.7)	0.26(0.18-0.39)
Divorced	93(11.4)	173(16.6)	0.59(0.42-0.83)
Educational Status			
illiterate	72(8.8)	171(16.4)	1.00
Informal education	57(7.0)	93(8.9.0)	1.43(0.91-2.27)
Grade 1-8 completed	306(37.5)	383(36.8)	1.62(1.15-2.27)*
Grade 9-12 completed	286(35.1)	313(36.8)	1.74(1.21-2.50)
Above grade 12	94(11.5)	80(7.7)	2.16(1.32-3.53)
Number of living children			
0	384(47.1)	174(16.7)	1.00
1	301(36.9)	304(29.2)	0.34(0.26-0.44)**
2	95(11.7)	313(30.1)	0.08(0.06-0.11)
3+	35(4.3)	249(23.9)	0.30(0.02-0.06)
Partner Tested#			
yes	466(44)	398(37)	1.00
No	53(5)	51(5)	0.8(0.6-1.3)
I do not know	39(4)	55(5)	0.6(0.4-0.9)*
Currently in a sexual relationship			
Yes	558(68.5)	504(48.5)	0.46(0.25-0.84)
No	257(31.5)	536(51.5)	1.00

Agested for age, income & other SES; #*considers only those who have reported presence of partner =1062* ** P value <0.05, **P value <0.001*

4.2. Contraceptive use and preference of HIV positive women

4.2.1. Socio-demographic characteristics of study participants

Of the 1418 women who participated in this study, 423 (29.8%) were in the age range 30-34 years, with mean (standard deviation) of 31.1(±5.5). The study participants were predominantly Orthodox Christians 1109(78.2%) and Amhara 849(59.9%) by religion and ethnicity, respectively. Concerning marital status, about 62% of the participants are currently married/cohabited and 242(17.1%) were single. Occupationally, 373 (26.3%) participants had their own private business and 292(20.6%) were housewives. Concerning educational status of the participants, 538 (37.9%) have completed grade 1-8, 466(32.9%) grade 9-12 and 133(9.4%) with higher education. Four hundred nineteen (29.5%) earn monthly income of less than 1000 Ethiopian birr and 390 (27.5%) women were with no monthly income (Table 5).

Table 5: Socio-demographic characteristics of HIV positive women in Addis Ababa, Ethiopia (n=1418)

Socio-demographic characteristics	ART users (n=770) No (%)	ART Naives (n=648) No (%)	Total No (%)
Age(in years)			
18-24	58(7.5)	91(14.0)	149(10.5)
25-29	219(28.4)	203(31.3)	422(29.8)
30-34	245(31.8)	178(27.5)	423(29.8)
35-39	186(24.2)	122(18.8)	308(21.7)
40-49	62(8.1)	54(8.3)	116(8.2)
Religion			
Orthodox Christian	604(78.4)	505(78.0)	1109(78.2)
Muslim	84(10.9)	76(11.7)	160(11.3)
Others (Protestant, catholic, Jubbah)	82(10.6)	67(10.3)	149(10.5)
Ethnicity			
Amhara	462(60.0)	387(59.7)	849(59.9)
Oromo	167(21.7)	147(22.7)	314(22.1)
Gurage	70(9.1)	54(8.3)	124(8.7)
Tigrea	47(6.1)	32(4.9)	79(5.6)
Others(Silte,gamo,welayta,yem,Sidama)	24(46.2%)(3.1)	28(53.8%)(4.3)	52(3.7)
Marital Status			
Single	126(16.4)	116(17.9)	242(17.1)
Married/cohabited	488(63.4)	397(61.3)	885(62.4)
Widowed	81(10.5)	55(8.5)	136(9.6)
Divorced	75(9.7)	80(12.3)	155(10.9)
Occupation			
unemployed	131(17.0)	133(20.5)	264(18.6)
Housewife	166(21.6)	126(19.4)	292(20.6)
Daily laborer	96(12.5)	112(17.3)	208(14.7)
Merchant	40(5.2)	36(5.6)	76(5.4)
CSW**	18(2.3)	13(2.0)	31(2.2)
Government worker	90(11.7)	84(30.6)	174(12.3)
Private business	229(29.7)	144(22.2)	373(26.3)
Educational Status			
illiterate	91(11.8)	78(12.0)	169(11.9)
Informal education	50(6.5)	62(9.6)	112(7.9)
Grade 1-8 completed	273(35.5)	265(40.9)	538(37.9)
Grade 9-12 completed	290(37.6)	176(27.2)	466(32.9)
above 12 grade	66(8.6)	67(10.3)	133(9.4)
Monthly Income (in Birr)*			
No Income	192(24.9)	198(30.6)	390(27.5)
Birr below 500	217(28.2)	144(22.2)	361(25.5)
Birr 500-1000	227(29.5)	192(29.6)	419(29.5)
Birr 1001-3000	112(14.5)	97(15.0)	209(14.7)
Birr above 300	22(2.9)	17(2.6)	39(2.8)

** Birr = (1USD=18.80 ETB)* ***CSW= Commercial sex workers*

4.2.2. Reproductive and clinical characteristics of study participants

About 55 %(422/769) of ART users and 45% (347/769) ART naïve women had recent CD4 counts of 350 cell/mm3 and 42% (363/863) and 58% (500/863) ART users and ART naïve, respectively were in WHO stage of disease I or II. About 70.3% (997/1418) of the study participants reported ever had sexual partner in their life time. Of these women who had partners, 81.8% (816/997) reported that their partners were tested for HIV, and 73.8% (602/816) are positive for HIV. Of the total study participants, 463(32.7%) women reported having one child, 321(22.6%) two children and 428(30.2%) no children. About 59% (507/859) and 41% (352/859) ART users and ART naïve women, respectively, had disclosed HIV status to partner/husband. Furthermore, 66.6 %(664/997) women reported they had open discussion with partner/husband (Table 6).

Table 6: Reproductive and clinical characteristics of HIV positive women in Addis Ababa, Ethiopia (n=1418)

Reproductive and clinical history	ART users (n=770) No (%)	ART naïves (n=648) No (%)	Total No (%)
Nadir CD4 Count			
0-199 cells/mm^3	466(79.2)	97(20.8)	563(39.7)
200-349 cells/mm^3	225(45.9)	265(54.1)	490(34.6)
350+ cells/mm^3	79(21.6)	286(78.4)	365(25.7)
Current CD4 Count			
0-199 cells/mm^3	125(64.4)	69(35.6)	194(13.7)
200-349 cells/mm^3	223(49)	232(51)	455(32.1)
350+ cells/mm^3	422(55)	347(45)	769(54.2)
WHO stage of Disease			
Stage I/II	363(42)	500(58)	863(60.9)
Stage III/IV	407(73.3)	148(26.7)	555(39.1)
Presence of partner			
Yes	560(56.2)	437(43.8)	997(70.3)
No	210(50)	211(50)	421(29.7)
Partner tested(n=997)			
Yes	479(59)	337(41)	816(81.8)
No	47(48)	50(52)	97(9.7)
I do not know	34(40)	50(60)	84(8.4)
Test Result of current partner (n=816)			
Positive	347(58)	255(42)	602(73.8)
Negative	119(60)	73(40)	199(24.4)
I do not know	13(87)	2(13)	15(1.8)
Child Tested (n=990)			
Yes	377(58)	273(42)	650(65.6)
No	175(51)	165(40)	340(34.3)
Disclose HIV status to anybody			
Yes	722(56.3)	558(43.7)	1280(90.3)
No	48(34.7)	90(65.3)	138(9.7)
Number of living children			
0	218(51)	210(40)	428(30.2)
1	260(51)	203(49)	463(32.7)
2	180(56)	141(44)	321(22.6)
3+	112(54.3)	94(45.7)	206(14.5)
Disclosed HIV status to husband (n=997)			
Yes	507(59)	352(41)	859(86.2)
No	53(38.4)	85(61.6)	138(13.8)
Discussed with husband/Partner (n=997)			
Yes	384(57.8)	280(42.2)	664(66.6)
No	176(52.8)	157(47.2)	333(33.4)
Discussed with HCWs*			
Yes	553(54.7)	457(45.3)	1010(71.2)
No	217(52.8)	191(47.2)	408(28.8)

*HCWs: health care workers

4.2. 3. Use and preference of contraceptive methods

Overall contraceptive use was 71% (75% (579/770) and 65% (422/648) among ART users and ART- naïve women, respectively). Four hundred five (28.8%) reported did not use contraceptive methods six months prior to the data collection period while contraceptive status was not known for 9 (0.6%) women (Table 7). In general male condom is the most preferred contraceptive method 45.7% (468/1001) followed by injectables 30.5% (306/1001).

Table 7: Use and preference of contraceptive methods among HIV positive women in Addis Ababa, Ethiopia, 2013

Type of contraceptives	ART users (n=770) No (%)	ART Naives (n=648) No (%)	Total No (%)
Contraceptive Use			
Yes	579 (75.2)	422(65.1)	1001(70.6)
No	186 (24.2)	222(54.3)	408(28.8)
Not known	5 (0.6)	4(0.6)	9(0.6)
Method Preference			
Injectables(Depot)	146(25.2)	160(37.9)	306(30.5)
Oral contraceptive pills(OCP)	55(9.4)	46(11)	101(10.0)
Intra uterine contraceptive device(IUCD)	16(2.7)	12(2.8)	28(2.8)
Implant(Jaddelle or Implanon)	48(8.2)	45(10.5)	93(9.2)
Consistent male condom use	310(53.5)	158(37.4)	468(46.7)
Female condom	4(0.7)	1(0.2)	5(0.5)
Categories of contraceptives methods			
Dual contraceptive methods (condom and hormonal methods)	98(14.7)	114(21.6)	212(18)
Barrier Methods (male or female condom)	317(47.5)	161(30.6)	478(40)
Hormonal methods(OCPs, Implant and Depot)	249(37.5)	251(39.9)	500(42)

#Dual contraceptive methods: hormonal methods and consistent condom use. N.B. a woman may have reported the use of ≥1 method value will not be added to 100%.

4.2. 4. Reasons given for choosing contraceptive methods

The primary reason given for contraceptive use was for protection against STIs in 28% (281/1001) followed by prevention of unwanted pregnancy in 21% (208/1001), among women using any method. Other reasons mentioned were convenient to use 18% (180/1001), easy to use 14% (138/1001), does not interfere with sexual activity 8% (82/1001), advise of health workers 5% (50/1001) and the like (Table 8).

Table 8: Reasons given in choosing methods of prevention among HIV Positive women in Addis Ababa, Ethiopia, 2014

Reasons for contraceptive use	ART users (n=579) No. (%)	ART Naïve (n=422) No. (%)	Total n=1001) No. (%)
Easy to use	78(13.4)	60(14.2)	138(13.8)
my friend is using it	18(3.1)	4(1.0)	22(2.2)
convenient/more convenient to use	109(18.8)	71(16.8)	180(18.0)
Does not interfere with sexual activity	47(8.1)	35(8.3)	82(8.2)
Protects against STIs/ HIV	183(31.6)	98(23.2)	281(28.1)
Prevents pregnancy	100(17.3)	108(25.6)	208(20.8)
Few or minimal side effect	17(2.9)	19(4.5)	36(3.6)
My husband has influenced me	1(0.2)	3(0.7)	4(0.4)
Advise of HCWs* (Doctors/ HOs/ Nurses)	26(4.5)	24(5.7)	50(5.0)

*HCWs: health care workers (Doctors/health officers/nurses)

4.2.5. Factors associated with contraceptive use

Using the logistic regression model, a number of socio-demographic, ART use, sexual history, disclosure behavior and clinical factors were identified as significant predictors of the association of contraceptive use (Table 9).

The results showed that ART use influences on women's decisions to use contraceptives compared to ART naïve women, the odds of contraceptive use among HAART users was significantly higher, adjusted for other potential confounders (AOR 1.60, 95% CI; 1.30 to 2.12). Similarly, women who had sexual partners were more likely to use contraceptives than women with no partners (AOR 2.32, 95%CI 1.60 to 3.40). On the other hand, married/cohabited (AOR, 0.41, 95%CI, 0.21 to 0.80) and widowed women (AOR, 0.31, 95%CI, 0.12 to 0.84**)** respectively, were less likely to use contraceptive methods compared to single women

Disclosure of HIV status, especially, with sexual partner has significant association with contraceptive use, women who disclosed their HIV status to partner were about two times more likely to use contraceptive than women who did not (AOR 2.23, 95%CI; 1.21 to 4.12). Furthermore, women who reported open discussion with their partner/husband were about two times more likely to use contraceptives than those who reported no discussion (AOR 2.0, 95%CI; 1.60 to 2.60).

Contraceptive use also increased with the number of living children women have. The odds of contraceptive use for women who have one child (AOR 1.7, 95% CI; 1.03 to 2.40), two children (AOR 2.6; 95% CI; 1.7 to 4.02) and three or more children (AOR 3.3, 95% CI; 1.90 to 5.60), respectively, were higher than women with no children. Similarly, the odds of contraceptive use was higher for women whose children are tested for HIV than women who did not (AOR, 1.6; 95% CI; 1.01 to 2.40).

Table 9: Adjusted analyses of variables associated with contraceptive use among women in Addis Ababa, Ethiopia.2014

Variables	Contraceptive Use		*Adjusted Odds Ratio AOR(95%CI)*
	Yes No. (%)	No No. (%)	
ART Use			
No	422(42.2)	226 (55.4)	1.00
Yes	579(57.8)	191(45.6)	1.6(1.30-2.12)**
Presence of partner			
No	236(26.6)	185(44.4)	1.00
Yes	765(76.4))	232(55.6)	2.32(1.60-3.40)**
Marital Status			
Single	168(16.8)	74(17.7)	1.00
Married/cohabiting	673(67.2)	212(50.8)	0.41(0.21-0.80)*
Widowed	73(7.3)	63(15.1)	0.31(0.12-0.84)*
Divorced	87(8.7)	68(16.3)	0.80(0.30-2.30)
Disclosed HIV status to husband			
No	87(11.4)	51(22.1)	1.00
Yes	679(88.6)	180(77.9)	2.23(1.21-4.12)**
Discussed with husband			
No	240(31.3)	99(42.9)	1.00
Yes	526(68.7)	132(57.1)	2.0(1.60-2.60)**
Discussed with HWs#			
No	242(24.9)	166(39.8)	1.00
Yes	759(75.1)	251(60.2)	1.60(1.20-2.03)**
Number of living Children			
0	275(27.5)	153(36.7)	1.00
1	329(32.9)	134(32.1)	1.7(1.03-2.40)**
2	241(24.1)	80(19.2)	2.6(1.7-4.02)**
3+	156(15.6)	50(12.0)	3.3(1.90-5.60)**
Child tested for HIV			
No	236(32.5)	104(39.3)	1.00
Yes	490(67.4)	160(60.6)	1.60(1.10-2.40)*

***P value <0.05** ****P-value <0.001** adjusted for age, education and other SES # health care workers

4.3. Change in fertility intentions 12 months after ART initiation among HIV positive women

At the baseline a total of 407 clients were interviewed. After 12 months 360 of the 407 were participated in the study. Forty seven clients (11.5%) were not included in the study due to the reasons depicted in Table 10.

Table 10: Reasons for not participating in the study, Addis Ababa, Ethiopia, 2014

Reasons for not participating in the study	Number
Lost to follow up	6
Died before the study finishes	2
ART naïve clients started ART after the study commenced	7
Not volunteer to participate in the study	10
Not from the study site	3
Excluded due to only one visit during monitoring period	3
Critically ill during data collection	3
Transferred out	5
Older than 49 years	8
Total	47

4.3.1. Socio-demographic characteristics of the study subjects

At the baseline one hundred eight (30%) and 100(28%) were within the age range of 30-34 and 25-29 years respectively. The mean age of women was 31(±5.5SD). The predominant ethnic group and religion were Amhara (58.5%) and Orthodox Christians (85%), respectively. One hundred and forty one (39%) clients had completed grade 1-8, 202(56%) participants were economically dependent or getting monthly income of less than 500 Ethiopian birr(26 US dollars) and 104(29%) were unemployed. About half of the participants were married/cohabiting (51%) and 84(23%) were single (Table 11).

Table 11: Socio demographic characteristics of HIV positive women in Addis Ababa, Ethiopia, 2014 (n=360)

Characteristics	ART users (n=190) No. (%)	ART Naïve (n=170) No. (%)	Total
Age			
18-24 years	22(11.6)	16(9.4)	38(11)
25-29 years	51(26.8)	49(28.8)	100(28)
30-34 years	59(31.1)	49(28.8)	108(30)
35-39 years	47(24.7)	46(27.1)	93(26)
40-49 years	11(5.8)	10(5.9)	21(6)
Ethnicity			
Amhara	112(58.9)	95(55.9)	207(58)
Oromo	39(20.5)	52(30.6)	91(25)
Guragea	21(11.1)	13(7.6)	34(9)
Tigrea	11(5.8)	8(4.7)	19(5)
Others(selte,hadya,sidama)	7(3.7)	2(1.2)	9(3)
Religion			
Orthodox Christian	159(83.7)	144(84.7)	303(85)
Muslim	19(10)	14(8.2)	33(9)
Protestants	12(6.3)	12(7.1)	24(7)
Education			
Illiterate/informal education	39(21)	39(23)	78(22%)
Grade 1-8completed	70(36.8)	71(41.8)	141(39)
Grade 9-12 completed	70(36.8)	47(27.6)	117(33)
Grade 12 and above	11(5.8)	13(7.6)	24(7)
Monthly income in Birr*			
No income(dependent)/<500	185(57.8)	17(42.5)	202(56)
Birr 501-1000(501-3000)	129(40.0)	19(47.5)	147(41)
Birr above 3000(above 3000)	7(2.20	4(10.0)	11(3)
Occupation			
unemployed	58(31)	46(27)	104(29)
Housewife	31(16)	24(14)	55(15)
Daily laborer	21(11)	22(13)	43(12)
Merchant	18(10)	8(8)	26(7)
Government employee	12(6)	19(11)	31(9)
Private businesses	50(26)	51(30)	101(28)
Marital Status			
Single	49(25.8)	35(20.6)	84(23)
Married/cohabited	92(48.4)	92(54.3)	184(51)
Divorced/widowed	49(25.8)	43(25.3)	83(26

**1USD=19.20ETB*

4.3.2. Reproductive, clinical and fertility intentions of HIV positive women (base line versus 12 months follow up)

ART naïve HIV positive women had more living children with mean of 1.4 (±1.3SD) as compared to ART initiated women with 1.2 (±1.2 SD) numbers of children. About, 41% (147/360) participants reported fertility intentions at the baseline, while 48.3% (174/360) reported fertility intentions at time two (12 months after follow up). At the baseline 42.1 %(80/190) of ART initiated women and 39.4% (67/170) of ART naïve women reported the need of more children. After 12 months of follow-up, the proportion of need for more children raised to 55.8% (106/190) among ART initiated and 40% (68/170) among ART naïve women. As compared to baseline respondents reported the need of higher number of children after 12 months (Table 12).

Of the 147 women who reported the need of children at the baseline, 46(31.1%) said to have within 12 months and the majority 52(35.1 %) had not yet decided when to have children rather reported that depend on "God will or I do not know." Whereas during the second visit of the 174 women 67(38.5%) and 36(20.7%) reported that want to have children within 12 months and after 24 months respectively. Sixty (35.1%) did not say on the time to have children. About 82.3 %(121/147) and 83.3 %(145/174) reported to have two or more children in the future at the baseline and 12 months after follow up respectively

The proportion of contraceptive use decreased from 194(53.9%) at the baseline to 174(48.3%) 12 months after follow up. Only 6.7% (n=13) and 8.6% (n=14) reported dual contraceptive method use at the base line and 12 months after follow up respectively (Table 12).

Table 12: Reproductive, clinical and fertility intentions of HIV positive women (baseline versus. 12 months after follow up) in Addis Ababa, Ethiopia, 2014 (n=360)

	Baseline			12 months		
Description	**ART initiated (n=190) No. (%)**	**ART Naïve (n= 170) No. (%)**	**Total**	**ART users (n=190) No. (%)**	**ART naïve (n=170) No. (%)**	**Total No. (%)**
Number of living children						
0	66(34.7)	48(28.2)	114(31.7)	66(34.7)	48(28.2)	114(31.7)
1	50(26.3)	52(30.6)	102(28.3)	50(26.3)	52(30.6)	102(28.3)
2+	74(38.9)	70(41.2)	144(40.0)	74(38.9)	70(41.2)	144(40)
Need to have more children						
Yes	80(42.1)	67(39.4)	147(41)	106(55.8)	68(40)	174(48.3)
No	110(57.9)	103(60.6)	213(59.7)	84(44.2)	102(60)	186(51.7)
Time to have more children						
Within 12 months	24(29.6)	22(32.8)	46(31.1)	41(38.7)	26(38.2)	67(38.5)
After 24 months	14(17.3)	26(38.8)	39(27)	13(12.3)	23(33.8)	36(20.7)
After 36 months	5(6.2)	5(7.5)	10(6.8)	6(5.7)	4(5.9)	11(35.1)
Undecided(do not know and God knows	38(46.9)	14(20.9)	52(35.1)	46(43.4)	15(22.1)	60(35.1)
Number of children needed						
1	13(16.2)	13(19.4)	26(17.7)	16(15.1)	13(19.1)	29(16.7)
2+	67(83.7)	54(80.6)	121(82.3)	90(85.0)	55(80.8)	145(83.3)
Contraceptive use						
Yes	87(45.8)	107(62.9)	194(53.9)	70(36.8)	104(61.2)	174(48.3)
No	103(54.2)	63(37.1)	166(46.1)	120(63.2)	66(38.8)	186(51.7)
Type of contraceptives						
Hormonal	43(49.4)	61(57.8)	104(54.1)	33(47.1)	56(54.3)	90(51.4)
Condom	40(46.5)	37(34.4)	77(39.3)	32(45.7)	39(37.1)	71(40.6)
Dual method use	4(44.6)	9(8.3)	13(6.6)	5(7.1)	9(8.6)	14(8)
Who influence you (n=107)						
My family	37(68.5)	33(62.3)	70(65.4)	34(64.2)	31(60.8)	65(62.5)
His family	17(31.5)	20(37.70	37(34.6)	19(35.8)	20(38.5)	39(37.5)
Husband tested(n=184)						
Yes	62(67.4)	82(89.1)	144(78.3)	67(72.8)	82(89.1)	149(81)
no	30(32.6)	10(10.9)	40(21.7)	25(27.2)	10(10.9)	35(19)
Test result(n=149)						
Positive	45(72.6)	60(73.2)	105(72.9)	51(76.1)	60(74.5)	111(74.5)
negative	17(27.4)	22(26.8)	39(27.1)	16(23.9)	22(26.8)	38(25.5)
Disclosed HIV status (184)						
Yes	49(53.3)	57(53.8)	106(57.6)	57(62)	62(67.4)	119(64.7)
no	43(46.7)	35(38)	78(42.4)	35(38)	30(32.6)	65(35.3)

4.3.3. Reasons for fertility intentions of HIV positive women

Out of 360 participants, 147(41.7) versus 174(48.3%) reported fertility intentions at the base line and 12 months respectively. Reasons for positive fertility intentions for a child were related to medical concern, socially and culturally oriented, as shown in Table 13. The most common reasons given for wanting child were related to presence of ART 104(71%) verses 94(54%), followed by improvement of health condition 10(7%) verses 48(28%), and children are important part of marriage11(8%) vursus 11(6%). A small percentage 7(5%) and 5(3%) thought that it was just due to recent marriage; by influence of husband 6(4%) versus 5(3%) respectively and some were concerned replace themselves.

Table 13: Reasons for wanting to have children in the future (before and after) (n=174)

Reasons to have children	Baseline (n=147)	12 months after follow up (n=174)
Presence of ART	104(71%)	94(54%)
Health condition improved	10(7)	48(28%)
Recent marriage	7(5%)	5(3%)
Husband insisted me	6(4%)	5(3%)
Health workers advice	2(1%)	4(2%)
To replace myself / Original desire for childbearing unchanged by HIV	5(3%)	5(3%)
Current child needs siblings/do not want to leave my child being alone	2(1%)	2(1%)
I like children(children are important part of marriage, either for present or future marriage	11(8%)	11(6%)

4.3.4. Predictors of change in fertility intentions

Adjusted analysis indicated that change from wanting no more children at baseline to wanting more children 12 months after follow up was significantly associated with woman's ART initiation (AOR, 2.47, 95% CI, 1.20-5.20), marital status: single (AOR,5.32, 95%CI, 1.10-25.92), married(AOR, 6.34 95%CI, 1.43-27.99) respectively more likely to report fertility intention than divorced/ widowed women. The number of living children women have: one (AOR, 0.32, 95%CI, 0.13-0.85) two and above (AOR, 0.36, 95% CI, 0.15-0.91) respectively were less likely to report fertility intentions in comparison to women without children. Family influence (AOR, 3.7; 95%CI, 2.20-6.20), disclosure of HIV status to husband (AOR, 1.95, 95%CI, 1.10-3.60), housewife by occupation (AOR, 3.60, 95%CI, 1.16-10.91) were predictors of fertility intentions. Whereas educational status, monthly income, partners' desire to have children (AOR, 2.10, 95%CI, 0.83-5.01) and test result of partners (AOR, 0.64; 95% CI, 0.22-1.86) has no association with change in fertility intentions of women living with HIV (Table 14).

Table 14: Adjusted logistic regression analysis of change in fertility intentions among HIV positive women after 12 months follow up, Addis Ababa, Ethiopia (n=360)

Variables	Change in fertility intentions		AOR
	Yes (n=41) No. (%)	No(n=319) No. (%)	Adjusted odds ratio with 95% CI
ART use			
ART naïve	11(26.8)	159(49.8)	1.00
ART initiated	30(73.2)	160(50.2)	**2.47(1.20-5.20)****
Marital status			
Widowed/div	3(7.3)	89(27.9)	1.00
Single	13(31.7)	71(22.3)	**5.33(1.10-25.92)***
Married	25(61)	159(49.8)	**6.35(1.44-27.99)***
Number of Living children			
O	22(53.7)	92(28.8)	1.00
1	9(22)	93(29.2)	**0.33(0.13-0.85)***
2+	10(22.4)	134(42)	**0.36(0.15-0.91)***
Family influence (n=360)			
No	24(58.5)	232(72.7)	1.00
Yes	17(41.5)	87(24.3)	**3.67(2.16-6.22)****
Disclosed HIV to partner (n=184)			
No	3(12)	62(39)	1.00
Yes	22(88)	97(61)	**1.96(1.10-3.60)***
Occupation			
Dependent	6(14.6)	98(30.7)	1.00
Housewife	13(31.7)	42(13.2)	**3.60(1.16-10.91)***
Daily laborer	3(7.3)	40(12.5)	1.10(0.245-4.80)
Merchant	6(14.6)	20(6.3)	2.40(0.52-10.81)
Government employee	3(7.3)	28(8.8)	1.30(0.26-6.61)
Private business	10(24.4)	91(28.5)	1.22(0.36-4.20)
Educational status			
illiterate/informal education	9(21.7)	69(21.6)	1.00
Primary education 1-8 completed	18(43.9)	123(38.6)	0.96(0.40-2.44)
Secondary education 9-12 completed	11(26.8)	106(33.2)	0.78(0.27-2.26)
Tertiary education diploma and above	3(7.3)	21(6.6)	1.10(0.22-5.10)
Monthly income			
No income to below 500 birr	18(43.9)	184(57.7)	1.00
Birr 501-3000	19(46.3)	128(40.1)	1.41(0.57-3.46)
Birr 3001 and above	4(9.8)	7(2.2)	3.49(0.70-17.70)
Partner wants to have children (n=184)			
No	8(32)	78(49.1)	1.00
Yes	17(68)	81(50.9)	2.1(0.83-5.01)
Partner tested (n=184)			
No	7(28)	28(17.6)	1.00
Yes	18(72)	131(82.4)	0.55(0.21-1.44)
Test result of partner(n=149)			
Negative	6(33.2)	32(24.4)	1.00
Positive	12(66.7)	99(75.6)	0.64(0.22-1.86)

**P value <0.001 *P value<0.05

4.4. Fertility and contraceptive decision making and support to HIV positive women

4.4.1. Participants in the qualitative study

A total of 53 participants were involved in the study, including 36 through FGDs, 10 IDIs and 7 key informant interviews. The 36 FGD participants included women age 18-49 years, adherence supporters and mother support groups. On average 9 participants were involved in each FGD with minimum 8 maximum 12 participants. A total of 10 IDI participants were positive women. The health care providers interviewed include six nurses and one health officer. The number and category of interviews conducted are summarized in Table 15.

Table 15: Socio demographic characteristic of the participants by category, Addis Ababa, Ethiopia, 2014

Categories	Age	FGDs*	IDIs*	KIIs*	All
Positive women	18-24 years	17	4	-	21
Positive women	25-45 years	19	6	-	25
Providers	23-35 years	-	-	07	07
Total response		36	10	07	53

*Key: *Focus group discussions, *in depth interviews, *Key informant interviews*

The experience and perception of clients and their providers on fertility and contraceptive decision making and available support in ART sites from clients and providers view points, are presented in Table 16. Three main themes were identified and are described by categories and codes. **Theme I** deals about **preferred contraceptives** which are subcategorized in to type of contraceptives, factors affecting on the choice of contraceptives, dual contraceptive methods, condom use and associated challenges (fear of disclosure, resistance men versus women themselves). **Theme II** discusses **fertility desire** that comprises factors affecting decision to have children such as presence of ART, women's desire, partner desire and family influence. T**heme III focuses on support** of health care providers and health workers voice that highlights

attitude of clients about existing support. It also containe health workers perception and experience about fertility and contraceptive options to women living with HIV.

All participants across the discussions reported importance of considering fertility and contraceptive options along with the existing care and support activities in the study area. It is important to integrate family planning services in the same site, as it is important to maximize fertility information and contraceptive use of women living with HIV.

Table 16: Fertility and contraceptive decision making and support given to HIV positive women by themes, sub categories and codes, Addis Ababa, Ethiopia, 2014

Themes	sub-categories	codes
Theme I: Preferred contraceptives	Type of contraceptives	common condom, other methods
	Factors affecting choice of contraceptives	availability, condition of women, side effects, miss understanding, mass media, accept what is available
	Using dual contraceptive methods	ignorance, attitude, inappropriate counseling, concordant result, partner resistance
	Challenge with condom use: factors affecting fear of disclosure Resistance: men vs. women .	religious, myth, partners influence ,women's misconceptions, taboo, Lack of available methods, disclosure Resistance(men vs. women) less value to women's suggestion lack of confidence submissive, fear of unknown similar result, dissatisfaction, own perception
Theme II: Fertility desire	Factors affecting decision to have children: presence of ART on women's desire partner desire and family influence	presence of ART, to replace self, not to leave a child alone, economic problem, loss of child, community acceptance of men, fertility and women, interference of extended family, unplanned pregnancy, stigma, social security, fear of being sterile
Them III: Support of health care providers and health workers voice	Support of providers and attitude of clients(perception and experience about support)	focus on condom alone, providers knowledgeable, busy , sero-status, , no focus on fertility decisions, no support for those who want to have children
	Health workers voice/perception and experience	women needs to have a child, CD4 and clinical improvement support is not comprehensive no other contraceptives except condom, lack of awareness, no training for other methods and double contraceptives not available in ART sites forced to refer to other sites

4.4.2 Theme I: Preferred contraceptive methods

4.4.2.1. Type of contraceptives

The majority of participants from FGD and IDI reported that the choice of contraceptive methods is based on condition of women and availability ofcontraceptive methods within each health institution. Most of the participants reported that condom is the preferred contraceptive method over others. Furthermore, injection, implant, loop and pills were among methods listed by participants.

4.4.2.1.1. Injections

Many participants reported that injection is the most preferred method following condom, since there is no need to remember now and then. However, refelected their concern about its problem like headache, back pain, excessive weight gain, irregularity of menstruation, mood change and sterility after taking it for a long period of time.

> *"I know women who became sterile after taking injections for a long time that is the main problem with family planning."* (38 years old HIV positive woman)

> *"...even I do not like to see my husband; such behavioral changes are often seen after I have started taking injection* (34 years positive woman)

> *".... my neighbor has been taking injections, but she has gained considerable weight"* (35 years positive woman)

On the other hand, those women who had living children preferred injection for its long term amenorrhea.

> *"I had enough number of children and have been using injection every three months. I liked it because it stopped menstruation and I was happy with it as it does not require remembering."* (37 years old woman with 2 living children)

4.4.2.1.2. Loop

Many participants preferred loop as it has no side effect like that of injection, no need to have surgery and it is possible to remove it when a woman want to have children. Participants reported that preference of loop was due to the current advertisement by mass media especially,

the Ethiopian Television. However, some had concerns of exposing their privat part of the body and worry that loop can go to internal parts of the body, deep in to the abdomen, may also go to the brain or can be displaced to unknown places and consequently may cause a long term problem.

> *"... it can go to the internal part of the body and shall be difficult for a woman working hard as it can cause back pain"* (36 years old ART naïve woman). *Another participant also reported that "for women who work hard, it is difficult to tolerate loops, but for women who have light work or do not have at all might be good."* (35 years old woman on ART)

4.4.2.1.3. Implants

Most participants reported that they prefer to use implant and have experience of using it, since there is no need of remembering, like that of pills and can be used for a long period of time but most providers are not comfortable for such options as it takes long procedures in comprision to injection. Some participants also reported that *"It is difficult for women carrying heavy objects as it causes pain on the shoulder.*" It was also reported that implants need surgery which causes pain. Few of them also do not want to use implant at all, due to *"concern of dying with foreign body (or implant inside the body)."*

> *"I have implant now, but the nurses promised me to remove if I die, since religiously it is not accepted for someone to be buried with foreign body*."(36 years old HIV positive woman)

All participants are well aware of the presence of permanent contraceptive methods such as tubal ligation and vasectomy, but had concerns about their irreversibility and acceptability religiously or culturally.

> *A participant enquired "after God has created us fully why we go for distraction?" she asked, 'what will happen if a woman pushed by husband?' No one will marry her again, so fertility is security for woman's existence in our community"* (31 years old HIV woman)

4.4.2.1.4. Oral contraceptive pills

Pills are methods rarely selected in comparision to injection, condom and implant. It is easy to forget, it irritates stomach it cannot be taken without having food.

"When someone takes tablet, one has to eat food if not taking tablet for a long time may be harmful." (40 years old HIV positive womanon ART); another *participant reported that pills can be accumulated in the stomach and form some form of swelling in the stomach which leads to long term problem."* (32 year's old ART naïve woman)

"… I personally do not like any tablet even I used to crash the tablet in to pieces before I take it God knows what will happen when I start ART." (39 years old HAART naïve woman)

4.4.2.1.5. Dual contraceptive methods

The majority of the participants from FGD and IDIs reported that their knowledge and practice of contraceptive methods were limited to condoms, rarely, implant, loop and injectables. Few participants reported the use of additional methods together with condom. They also said that they lack confidence to use additional methods mostly due to lack of knowledge on the need of additional methods and fear of side effects when taken with ART. Most of the participants addressed that they lack clear information except condom use especially from health care providers.

*"… I think the information we get about dual use of contraceptive methods is not complete this is due to inadequate counseling by health care providers…" (*28 years old ART naïve woman)

4.4.2.1.6. Male condom

Participants reported that condom is the preferred method and most participants agreed that women should negotiate for male condom to prevent drug resistant virus and prevent other sexually transmitted infections. Furthermore, condom is important for couples to prevent unplanned pregnancy and sexually transmitted infections *and is "the method women easily get from ART sites, while coming for follow up."*

Factors affecting condom use

Using condom has challenges, the most common being myths attached with such as "*condom brings HIV itself*" condom can lead person "*to promiscuty*" and "loss of trust between couples". The other challenge is economic dependency of women, misconception of couples and resistance

of men, lack of decision making, taboo talking sex and sexuality, especially from a woman side. Women are unable to talk freely and do not try to convince their husbands to use condom.

Fear of disclosure

Most participants reported that women are the first to know their sero-status, usually screened at antenatal follow up or for other health problems and they are the first to face challenges in disclosing HIV status and dealing with condom use issue. It is not easy for dependent women to overcome such a problem. Most of the participants said that *"When a husband became HIV positive the wife usually, accepts using condom, but the problem is serious when their sero-status becomes different."* It is also a challenge for those women living being discordant which end up in lack of confidence, violence and divorce.

Male resistance

Most of the participants reported that men are not comfortable using condom and do not want to discuss it anymore. Men usually resist using condom because of lack of sensation, failure to have erecting and feel as if "*eating a banana without "peeling*" and wide range of misconceptions about it.

> *"Some men want to relate condom as if it contradicts to their belief as "God do not allow sex with covered organ.*"(32 years old HIV positive women)

> *"If I ask my husband to use condom he may not trust me or my complain not to use, usually when husbands are requested to use condom the first thing they raise is "you do not have trust on me "you are cheating on me and that is why you request me to use condom' where do you get this?' and the likes are common reasons for their resistances."* (34 years old HIV positive woman on ART*)*

> *"I have never used condom because when I asked my husband to use it he was not willing as a result I was forced to to use other pregnancy prevention methods, like pills "* (37 years old HIV positive woman)

> *"I asked my husband to use condom but rather asked me 'what change to bring, once we become positive?' 'Why do you bother and what comes after all?' I could not convince him and still we have sexual intercourse without condom. I am on ART and my husband is positive, but did not start ART."* (30 years old HIV positive woman on ART with husband who did not start)

Conversely, women have unknown fears like if a woman resists to have sex with her husband without condom she feels that he might go to other woman and the consequence might be worsen, so women themselves, accepted the issue as if their responsibility is to satisfy their husbands request.

> *"A Woman should use condom if her husband is willing to use, if he resists, she do nothing because it is woman's responsibility to satisfy her husband otherwise he will go to other places."* (37 years old woman with HIV positive husband)

Men also resist using condom when they buy sex from commercial sex workers (CSWs) after they take alcohol. In case a CSW asked to use condom, then she gets less payment in comparison to those who are willing to do without condom.

> *"… I am ready to use condom if men are willing but most of my clients are not willing to use rather they pay me more money , I usually be flexible and use without condom due to fear of losing my clients."*(36 years old HIV positive CSW on ART)

Most of the participants reported, that it was men who decide not to use condom without respecting women's suggestions as they are bread winner and physically strong as well as accepted by the community. The issue is challenging even to women who have relatively better awareness about condom use and working as mother support group and adherence supporters at different health institutions.

> "*I usually tell my friends to use condom, but lost my confidence since I am not using condom due to my husband's resistance*." (30 years old woman working as mother support group and living with positive husband)

> *"I could not use a condom because when I told my husband to do so, he shouts at me and warned me that will go to the extent of separation." (*36 years old woman working as peer educator)

> *"We were married after both my husband and I became HIV positive and when asked him to use condom he usually says" both of us are positive why do you force me to use condom? "Do you have doubt on me?" when I asked him repeatedly one day he said "the reason I married a positive woman is not to lose my freedom" From that on I stopped asking him due to fear of the consequence* (31 years old positive woman living with positive husband on ART working as peer educator)

Women's resistance

On the other hand, the problem of resistance against condom use is not only limited to men, but also there are women who are not willing to use condom. The majority of the participants reported that many HIV positive women are living with HIV negative and or ART naïve husband, but not using condom properly. They reported that couples are doing mistake as a result of ignorance, resistance and ART complacence. Moreover, many people faile to use condom as result of being positive, participants across the group indicated that when both partners become positive and stay with the infection they faile to adhere on condom use, rather want to associate means of trust and love.

> *"As far as we trust each other, why do we worry about condom after being positive*?"(41 years old HIV positive woman on ART living with husband on ART)
>
> *"I do not use condom because it dissatisfies me."* (38 years old HIV positive woman living with HIV negative husband)
>
> "*I have met a new partner quite recently but I have not discussed my sero status. I am not ready to tell him about my sero-status. Obviously, it is difficult for me to raise condom issues at this time before disclosure and I heard while he complains that 'condom makes me lose interest in sex'. "* (23 years old woman on ART living with unknown sero-status boy friend)
>
> "*I myself not comfortable to use condom and at any cost I need it in naked condition."* (40 years old HIV positive woman living with negative husband)
>
> *"I know my friend who had new partner after the death of her husband. She has been on ART for many years and not living with new partner, she has adequate income and children from the deceased husband but she did not tell her status to the new boy friend and even do not know the status of her friend. When I ask her to tell the reality she resisted me due to fear of separation as she is in love. In general he is looking for the available resource and she is looking for the satisfaction and nobody bothers the prevention issues at this time.*"(30 years old HIV positive woman)

4.4.3. Theme II: Decision to have children

4.4.3.1. Factors affecting fertility decisions:

All participants indicated that many women living with HIV intended to have children. The decision to have or not to have children is influenced by multiple factors, including presence of ART, health improvement, situation about PMTCT (prevention of mother to child transmissions of HIV), income, desire to replace self, social security family and partner influence.

4.4.3.2. Effect of ART access on fertility intentions of women

Availability of ART made possible an extended lifespan and cause HIV positive women to rethink their future children and contraceptive options. Many discussants acknowledged that ART has made "*the impossible one possible."*

> *"Before start of ART live alone to think fertility it was hard to imagine and live in this world. No one wanted to die by leaving orphaned child, but ART has changed our life."* (30 years old HIV positive woman)

> *"Starting ART is a must for a woman before she decided to have child, unless we take precautions pregnancy might come accidentally like it did on me. "For example I am not yet started ART but I got pregnant by mistake and thanks to God my child is free but I will never do the second mistake."* (25 years old HIV positive woman)

Many discussants reported that they have strong desire to have children. A 34 years old HIV positive women reported that because "*have seen when positive women are getting free child*" and '*No problem to have children as far as woman uses ART properly'*; another women added that 'I *have plan to have children because I get improved thanks to ART and the next issue is income that might challenge me otherwise I have plan to have children in the future.'*

Still the desire of future children was not limited to one child as most of them reported that "*not good to leave a child alone because a child will face problem as we have been facing stigma. If we get at least two they will support each other*."

> "*…I personally had free child last year and I still want to have additional child in the future because I do not want to leave my child alone."* (26 years old HIV positive woman)

Many participants suggested that "at least two children are must" even participants expressed their concern to extent of "a *person without children is Bekumu yemote new"* in Amharic means being childless is equivalent to '*person who is buried alive'."*

> "*I want to have children, they are my only gifts; I trust to leave to my family and relatives when I die*."(31 years old HIV positive woman)

While future fertility is more important among women who do not have children, it is less important among those having living children and who lost children especially as a result of HIV.

> *"Currently, I have three children they are enough for me "Enrsun shih yderegelegn" in Amharic means "I pray to god to let them be thousands"* (38 years old HIV positive woman who have children)

Conversely, women who lost their children are less interested to have children in the future as a result of bad experience she had. *"I have sad event due to a loss of a 5 years old child with HIV, currently I do not plan to have children in the future."*(34 years old HIV positive woman who lost her child*)*

However, the situation is not the same across all participants as most of the discussants reported that "*Moten mashenef yemichalew bemewlled* new" means "The only means to win "*the battle against death is by having children*"

4.4.3.3. Partnership influence

Majority of the participants reported that woman should accept what her husband is saying if she wants to have smooth marital relation otherwise the consequence is severe. Not only the husband, but also woman consider a means of existence and love to her husband.

> "*… For a man, who gave his life to his wife, he should get children as a reward and woman should give births, or else she cannot convince her love to him."*(32 years old HIV positive woman)

4.4.3.4. Family influence

There is deep rooted misconception about pregnancy and women especially at early stage of marriage in our community and association of childbearing as the issue of women and accepted as a norm. Furthermore, interference of extended family and social encirclement in general predisposes women for unplanned pregnancy.

In Ethiopian community having a child is a must for a woman in order to get her position and acceptance from in-laws and the community. Majority of FGD participants reported that pressure starts during her wedding as everyone sings a common song like "yezare amete yemamush ennate" meaning "by next year she should be a mother." This has strong message for couples to have child as soon as possible. Husband's family including, neighbors whisper to him; as 32 years old woman rightly put "Bekllo new Feres *Yegezahaw*?" in Amharic means did you buy a mule or a horse? They want to represent a sterile woman to a mule and a fertile woman to a horse.

> *"My neighbor asked me nine months after my wedding 'why do you stay for nothing?' or 'do you have someone you are looking for?' I got pregnant without my plan, just not to be blamed" (30 years old HIV positive woman living with HIV positive husband)*

> "My *neighbor asked me why I do not give birth and I asked her to pray for me. She said to me unless you take contraceptives how could this happen, and she suspected that I hide contraceptives (pills) in my bedside."* (21 years old HIV positive woman living with negative partner)

Discussants from IDI addressed that for planned pregnancy and preventive practices couples' agreement is important, but couple's agreement is not sustainable as it can be affected by social norms of the community and when family and neighbors start murmur and pointing finger the couples planning is distorted

> "*I married an HIV positive husband and before our marriage we agreed not to have a child but he has changed his promise and even asked me to get pregnant sooner than my expectation?"* (30 years old HIV positive woman)

4.4.4. Theme III: Support of health workers for HIV positive women

4.4.4.1. Women's perception and experience about support from ART providers

The majority of the participants across the discussants reported that health care providers working in ART sites are comfortable in discussing about "*condom together with ART*". However, the fertility and contraceptive option including dual contraceptive method use is largely neglected. They are reluctant in advising other methods as 30 years old HIV positive woman rightly put *"I think it is not available with them*"; other participant added that "*the first and the last counseling is condom*." (29 years old HIV positive ART naïve woman); unlike ART providers those who are working in family planning units are not familiar on how to handle PLWH and difficult to choose the best methods.

> *"I have been with the virus for the last eight years, I have never heard while health workers are talking about fertility and contraceptives options, except condom. I was pregnant some five years back and health workers were shocked at me instead of supporting me, but now a lot of changes are there."* (28 years old HIV positive woman)
>
> "*Health workers from ART sites have condom at hand it was nice to have additional methods together with ART and it will be easy for us to communicate with them because they are the one who knows our status."* (21 years old HIV positive woman)
>
> "*I think it will be nice if everything available in one place, no need to worry about disclosure to other providers and it is difficult to tell about our status to everybody."* (37 years old HIV positive woman)
>
> *"When we go to other providers, we never know might be a person who knows us and difficult to be sure about our confidentiality in such cases, we do not trust all providers can respect our confidentiality."* (38 years old HIV positive woman)
>
> *"It is difficult to tell now and then about HIV to everybody and more difficult to providers who does not know on how to handle PLWH."* (34 years HIV positive woman)

When asked whether they have asked the health care providers or not: Most of them said did not ask, the common reasons was they believe that providers are knowledgeable, "*they have capacity to select the best for us.*" Many participants also reported that providers are busy and many clients are waiting outside. Few participants also reported that they have asked providers, but the

only method as usual condom and recommend going to other units or health institutions to get other methods

> *"When they advise us to go to other providers we need to arrange some other time and it is difficult to get permissions from our work place, it would be nice if we get all services on the same place by the ART providers along with our follow up time*." (32 years positive woman)

> *"I asked providers about other methods and they recommended me to go to other places, actually I did not, due to fear of disclosure and feel that other providers are not familiar on how to handle positive women."* (23 years old HIV positive woman on ART)

However, few of the participants reported that the problem is from us. If we raise the question they will give us the information, but we assume that they are "*busy and difficult dealing such issues, while many clients are waiting outside.*"

The point was substantiated by health care providers who undergone Key informant interviews, three participants conformed that the emphasis is on ART and condom provision. Whereas; the fertility and contraception options are highly neglected

4.4.4.2. Health workers view about fertility and contraceptive decision of WLWH

All health care providers reported that HIV positive women have a right to have children, plan family, use appropriate preventive methods and should get target oriented support. They also emphasized that as far as her CD4 cell count and clinical symptoms are improved they have chance of getting everything they want. Furthermore, they usually advise clients to stay for a while and inform provider about their situation before they decide to get pregnant.

> *"We used to advise women not to get pregnant at early times of ART and always we used to tell about use of prevention methods especially using condom. Most of them accept as we tell them to do, but few women are requesting 'condom is not enough' but we do not solve such problem as we did for ART. This might be lack of awareness from our side and practically we know many clients become pregnant while they have been reporting condom use."* (HCW form hospital)

Many providers promote only condom to HIV positive women because no contraceptive options to select and are not confident to inform the safety about existing options. Clients are not

empowered when they go to other health institutions for other options and commonly refrain from going to the recommended place.

> *"We do not have options except condom. The family planning is not available in our facility, we usually advise them to go to nearby health institutions. They usually request how to approach other providers and worry on how to tell their sero-status.* (HCW from Hospital)

> *"We recognize their concern about stigma and we usually tell them the presence of shared confidentiality." But they are not confident to discuss the issue and give the chance of selection to the providers; this resulted from lack of awareness from clients and inappropriate counseling from providers."* (HCP from hospital)

Participants reported that few clients were willing to raise discussion on contraceptive options and fertility issues, but providers do not give chance to go further discussion about the advantages and disadvantages of each contraceptive method. The participants also highlighted that the problem resulted from lack of updated knowledge about each methods and counseling issues

> *"We do not have adequate knowledge on how to handle different contraceptive methods to positive women and we feel as if it is time consuming to open such topic while many clients are waiting outside*."(HCW from hospital)

Few of them also agreed that they have basic knowledge about different contraceptive methods, but they lack updated practices and counseling techniques. Majority of them also discussed that they have gap in considering the fertility and contraceptive options along with ART. This has contributed for clients' misconception. The providers also stressed that unless providers are updated the problem will sustain being public health issue in the study area and beyond.in general the summery of main findings are presented in Table 17.

Table 17: Summary of the main results of the dissertation, Addis Ababa, Ethiopia, 2014

Papers	Objectives/problems	Main findings
Paper I	Fertility intention	44% reported fertility intentions. ART use associated with fertility intentions (AOR; 1.26, 95%CI; 1.01 to 1.60) being on sexual relationship, young age, being single and having fewer or no children were found to be predictors of fertility intentions
Paper II	Contraceptive use and method preference	Prevalence of contraceptive use 71%. ART users use contraceptives than ART naïve. Male condom& injectables preferred contraceptive methods among both groups ART users reported the use of contraceptives (AOR 1.60, 95% CI 1.30- 2.12) than ART naïve women presence of living children: one (AOR 1.7, 95%CI, 1.03-2.40), two (AOR 2.6, 95%CI, 1.7-4.02) and three (AOR 3.3, 95%CI, 1.90-5.60) respectively were found to be predictors of contraceptive use Low proportion of dual contraceptive method use (14.8%) was observed among ART users
Paper III	Change in fertility intentions 12 months after ART initiations	Overall, 41 %(n=147/360) women reported fertility intentions at the baseline, while 48.3 %(n=174/360) reported fertility intentions 12 months after follow up. The proportion of fertility intention 12 months after antiretroviral therapy (ART) initiation was higher among HAART initiated 55.5% (n=106) than ART naïve 40% (n=68) women. change associated with woman's ART use (AOR, 2.46, 95%CI 1.20-5.20)
Paper IV	fertility and contraceptive decision of women and support: positive women and providers experience & perception	Majority of participants had wide range of contraceptive preference. Most of the participants reported to have at least two children and important especially for women without living children. The common reason for women to have children was resulted from family influence, partner desire and community perception being childless is taboo and considered as women's responsibility. Many participants indicated that providers are supportive in offering information but restricted to preventive methods using condom. Whereas not eager to discuss fertility and family planning options due to wide range of misconception

5. DISCUSSIONS

5.1. Fertility intention of HIV positive women

Our finding highlighted that the prevalence of fertility intention is 44% which is consistent with the previous studies in South Africa 44% & 45% respectively [32, 33]; but higher than reports from northern part of the country (18.5%) [57]; Uganda(24% and 28.6%) [25, 114], Canada (25.8%) [26] and lower than another study from Canada (57%) [115]. The difference might be related to study site, time and study subject difference. The other plausible difference could be associated that being HIV positive did not remove childbearing intentions rather there exist diversity.

The proportion of women who reported fertility intention also showed variation with being on ART; this might be an indication of women hoping the presence of ART. Furthermore, wide range of reasons were reported as to why women intended to have children; such as presence of ART, improvement of health conditions, influence of husband, like children as they are gift of God, advice of health workers and to attain ideal family size. This suggests the need for integrating target oriented and individualized counseling along with comprehensive care and support activities. This study has shown that ART use has an association with fertility intentions in which women who are on ART reported more fertility intention over those who did not. The finding is consistent with previous studies [12, 84], but different from other studies in Uganda and South Africa [25, 33].The difference might be associated with variation in terms of ART access and community awareness. The other plausible reason might be related to multifaceted nature on the predictors of childbearing intentions.

The study has indicated that women being single, low parity and young age were directly associated with fertility intention, the finding is similar to study conducted in south Africa [33], but different from studies conducted in Uganda and Zimbabwe [25, 74]. The difference is related to study subject difference.

Widowed and divorced were less likely to report childbearing intention compared to single. The probable reason might be related to those groups of women who had children or social instability

might impose fear about childbearing. However, single women intended to have children from cultural influence; in Ethiopian community having children is highly valued [57] and considered as social security.

The respondents with twelve grades and above had two (AOR 2.16)-fold higher in childbearing intention compared to illiterates, this is similar to a study conducted in South Africa [33]. This is related to participants who under gone formal education might hope presence of ART prevent transmission. Furthermore, education especially of women, contributes to decision making autonomy on fertility issues and knowledge of family planning. Studies have shown that women's relative decision-making autonomy, independent of men authority facilitates fertility regulation [116, 117].

5.2. Contraceptive use and method preference among HIV positive women

The issue of contraceptive use and method preference among women enrolled in HIV care and treatment programs in the study area has important implications for the health of women and their infants. Overall, the proportion of contraceptive use was 71% irrespective of their ART use. Previous studies from Uganda and South Africa reported higher than our finding 85% and 78%, respectively[6, 43]. On the other hand, our finding showed higher proportion than previous findings from other developing countries, which reported between 28 and 53% [24, 118-120] and than earlier reports within the country between 43 to 54% [52, 54, 55]. The difference is associated with study time differences. The other plausible reason might be associated increased public awareness on contraceptive decisions.

The result is different from contraceptive use of the general female population in Addis Ababa reported 63% [121]. The most probable reason might be that HIV positive women have frequent contact with health care providers and demand for contraceptives might be higher than the general population.

In the logistic model, adjusted for potential confounders, we found that contraceptive use was significantly higher among women receiving ART than ART naïve; which was also reported by previous studies from Uganda and South Africa [6, 43]. This may be a reflection of the fact that

continual exposures to secondary prevention messages along with ART might have impact on contraceptive use. Even though, male condom is the most preferred method by all study participants, it was higher among those receiving ART compared to ART naïve women (54% vs. 37%, respectively).

In addition to this, the use of dual contraceptive methods (condom with other methods) is safe to prevent both unintended pregnancy and HIV [100, 122]. In our study however, low proportion (14.7%) of dual contraceptive method use was observed among ART users. This may reflect that the study population is at risk of acquiring sexually transmitted infection including, drug resistant HIV virus.

Our finding has also showed that women with living children have reported contraceptive use than those with no children; the result was consistent with studies reported from Uganda and South Africa [6, 43]. This suggests that the desire to have children among those with no children is higher for obvious reasons and consequently avoiding contraceptive use.

Furthermore, women who have open discussion with partner or health care providers have better contraceptive usage profile than their counterparts. This suggests that disclosure of HIV status to a partner may be important to get support from family and discussion can clarify uncertainties about contraceptives and possibly to strengthen confidence of women. Besides, women who knew the HIV status of their children reported were contraceptive use than their counter parts; this could be related to women who tested their children have better exposure and more concerned on the prevention of unintended pregnancies.

5.3. Change in fertility intentions 12 months after ART initiation among HIV positive women

In this study, we assessed change in fertility intention on the time of ART initiation and when HIV positives linked to ART site) and 12 months after follow up and factors associated with fertility intentions. Our finding from the two round analysis indicated change in the proportion of fertility intentions of HIV positive women from 41% at the base line to 48.3% after 12 months

follow up. The finding is similar to what other studies have found in sub-Saharan Africa [9, 69, 84]. However, contrasts with recent cross sectional study in South Africa [33], this might have resulted from difference in the study design.

African social and cultural values dictate that having children is a key to the identity social status of women and men, including for PLWH. Similarly, our finding documented that majority of women reported children are important part of marriage. It was also indicated that child bearing helps to secure marriage and linage continuity and many families often recommend that ,these findings are also substantiated by previous study that women on ART quickly became pregnant even before their CD4 counts were improved because they not only want to fulfill their womanhood roles but also to prove that they were healthy [35].

ART use together with other factors became significant predictor of fertility intentions among HIV positive women in the study area, where total fertility rate is 2.4 children per reproductive aged women in Addis Ababa [2]. ART users compared to ART naives were more likely to change fertility intentions from wanting no more children at the base line to wanting more children 12 months after ART initiation. The effect is statistically significant after controlling for potential confounders of fertility, such as number of living children women have, age, income and socio-demographic conditions. Furthermore, it was identified that change in fertility intentions associated with the number of living children women have, marital status. This is similar to previous reports from sub Saharan Africa [84].

In compression to the base line, the contraceptive use of women decreased 12 months after follow up and relatively majority of the study subjects reported hormonal contraceptive use in both scenarios which is effective in preventing unintended pregnancy. However, low proportion of dual methods use 13(6.6%) vs. 14(8%) was reported at the base line and 12 months after follow up respectively. The finding is similar with finding reported (15%) from sub Saharan Africa [19]. Our finding reinforce another result from sub-Saharan Africa reported low dual contraceptive methods use resulted from low acceptance of condom use due to socio-cultural influences and insufficient information [123].

5.4. Fertility and contraceptive decision and support given to positive women

This study shows valuable insights in to perceptions of women living with HIV and the providers view and experience about fertility and contraceptive decision of women living with HIV and assessed prevailing situation that women living with HIV directly face while they are trying to have safer fertility and preventive practices.

It was reported that condoms were the preferred method of contraceptive available in the ART sites and linked with the care and support activities specifically to positive women in the study area. HIV positive women are either using one contraceptive method or not using at all being on ART. They are suffering from secrecy, powerlessness, male dominance and economic dependence. In addition, men are not willing to us condom due to lack of sensation, discomfort, difficulty with organ erection and failure to accept women's suggestion.

Furthermore, our finding indicated that, the desire to have children and demand for contraceptive option among the study subjects is high, which is consistent with previous studies from sub Saharan Africa [32, 74]. However, the information to those who want to have children or want to use other options is scarce, which is challenging to positive women and had wide range of misunderstanding about advantages and disadvantages of each method. This might have resulted from lack of information as it has been reported in previous study from developing country [8].

Women in the study area reported that with the exceptions of male condom, getting other contraceptive methods is difficult, as it requires disclosure of sero-status to other providers, and failure to relay to those who do not know their status; as a result, women failed to stick to what they want to plan. Furthermore, though contraceptives are free in public health institutions in the country, they have to pay when they want to get it from private institutions and if the other option requires extra transport and time that maximizes the cost of contraceptives in their locality. This is similar to previous studies reported cost of contraceptives as reason that hindered them from using options [124, 125]. In considering contraceptives availability contextual socio-cultural norms, health concern and misconceptions need to be addressed.

Presence of ART has positively affected the desire of children and family planning option of the study subjects. The result is consistent to previous report from Zimbabwe [74]. Participants want to have HIV free child whenever they want to have, but most of them relyed on either condom alone or other separate contraceptive methods, which indicates presence of information gap. This finding is consistent with a previous study conducted in the northern part of Ethiopia associated with lack of knowledge, communication gap between providers and lack of condom approval [99].

Gender inequality places women at greater risk of being infected by HIV. Women lack power over their sexual lives, the prevailing social and economic inequalities increases their vulnerability. With increased poverty and other factors women found themselves for causal relationship with men for financial gain. The problem is severe among those working as commercial sex worker.

The demand and reasons to have children among HIV positive women is similar to HIV negative women as previous study in the country indicated [126] and our finding reinforced that influenced by social acceptability, availability of methods, own perception, means to minimize stigma and considered as social security. However, the cumulative effects more sever among HIV positive women and have forced them to demand at least two children, primarly to continue their offspring's, who will support each other and survive with existing stigma.

In general, there is wide range of misconception about pregnancy and women especially at early stage of marriage in our community: male acceptance, relation of childbearing as the issue of women and interference of extended family predisposes HIV positive women to unplanned pregnancy, this is similar to previous studies from developing countries such as Argentina 55% [127] and sub-Saharan African 10-65% [18] HIV positive women reported unplanned pregnancies [18, 127]. This result indicates the importance of public health intervention that targets HIV positive women.

Clients have fertility desire and demand for variety of contraceptive methods, but providers think in terms of immunological response (CD4 cell count) and clinical improvement. The result is consistent with earlier study from South Africa [128]. Furthermore, our finding indicated that HIV positive women had not discussed their fertility desires with health care providers due to fear of anticipated negative reactions. This is consistent with previous studies from Africa [8, 24, 32]. Those women who tried found providers were busy and not open for discussion and others also admitted that reluctant by assumption that providers know the best option for them.

Similarly, providers evidenced misconception about options and safe methods largely resulted from insufficiently trained providers especially on counseling part. Moreover, providers noticed that they usually discuss pregnancy risk and STIs risk separately. The counseling ways did not help them to think comprehensively and the issue more severe when the fertility need of client is not considered at all. Then updating providers should be vital issue to satisfy the current need of women living with HIV in the study area.

6. VALIDITY AND GENERALIZABILITY

Validity of a study refers to the degree to which the test measures what it is supposed to measure or the accuracy with which the study measured its findings [129]. Validity includes internal and external. Evaluating the quality (validity and generalizability) of both the quantitative and qualitative data is mandatory when both methods are conducted.

6.1. Internal validity

In **quantitative research** validity (internal validity) refers the ability of measure correctly, what is supposed to measure (getting the truth-value). It needs the evaluation of chance, bias and confounding as alternative variable for research findings.

Chance measures the likelihood that sampling variability (random error) accounted for the observed association [130]. Our study had assessed the role of **chance** by using adequate and representative samples to answer each specific objective. Appropriate statistical test was

performed. Its effect was also detected by the confidence intervals. In some of the categories of independent variables, small sample sizes during the multivariate analysis were observed. In such situation, re-categorization by merging or excluding very small categories was done. Thus, the role of chance in explaining the observed difference was unlikely.

Bias (deviation from the truth) is a systematic error in the design, conduct or analysis of the study that results in a mistake in estimating the effect of the exposure [131]. Various actions, starting from questionnaire designing to data analysis, were taken to reduce the role of bias as alternative explanation for the research findings.

The study strictly followed scientific research methods such as random selection of participants with relatively large sample size. The use of questionnaire adopted from previous data collection tools from different settings and translated in to and administered by the local language (Amharic), use of experienced data collectors, moderators and note takers with additional training in CHCT, ART and comprehensive HIV care and recruited with cautions, presence of intensive training and close supervision were among the major inputs to reduce interviewers and other measurement biases. Furthermore, the data collectors were different from the care providers working in the study sites. To minimize the re call bias, relatively recent last 6 months (Paper II) and 12 months (Paper III) information was gathered and also tried to confirm the response from patient's records. Explanation was also given by data collectors before starting interview. Interviews were conducted in private, ventilated and well lighted room to assure their privacy.

Study participants involved in follow up study (Paper III) were different from those participated in cross sectional survey and additional three days training was given to data collectors. In addition to this, use of different tracking methods, such as home visiting, use of appointment card, telephone call, reminder during previous follow up period and interviewing in convenient places were measures to reduce loss to follow up. Furthermore, interview was carried out in the same place and similar study subjects were involved both at the baseline and 12 months after ART initiation. The data were collected using similar tools.

Confounding (*from the Latin confundere, to mix together*) can be defined as a situation in which a measure of the effect of an exposure on risk is distorted because of the association of exposure with other factor(s) that influence the outcome under study [132]. Confounding can occur when another exposure exists in the study population and is associated both with the disease and the exposure being studied [133]. Confounding can over estimate, underestimate or change the direction of the observed association, and must always be accounted. The baseline difference observed in socio-demographic characteristics of women and other measured variables can act as confounding factors. Hence, addressing confounding was one of the major actions in this study. In general, advanced statistical analysis like binary and multivariate logistic regression analysis (Paper I-III) were applied to control potential confounding effects of some selected variables on the main outcome variables of the study and prediction of population parameters.

In the **qualitative study (Paper IV),** the use of multidisciplinary research team verbatim transcription and pre-defined analytical procedures were used to promote the study rigor. The trustworthiness of the qualitative findings were assured by the use of Lincolin and Guba's criteria of credibility, dependability, confirmability and transferability [113, 134].

Like internal validity in quantitative studies, **credibility** focuses on the confidence in truthfulness of findings. It can be evaluated by different activities including prolonged engagement, persistent observation, triangulation, member checking and peer debriefing. The principal investigator and data collectors were familiar with the cultural and social backgrounds of the study participants also have additional trainings on comprehensive HIV care and support.

Informative discussants were selected purposively from different categories such as HIV positive women both ART users and ART naïves; mother support group, peer educators and health workers were interviewed to enhance triangulation. During data collection, daily discussions were conducted in order to understand what in formations were saying and to identify the areas that needed to probe for future interview. Peer debriefing was done at the end of data collection and during presentation of preliminary findings through which we reviewed substantial comments.

Confirmability: focuses on the extent that the research findings can be confirmed by others [135]. The tape-recorded and transcribed data were made ready for other researchers to do their own analysis. The process is "audit trial" which enables to verify the interpretation is based on the collected data. Independent coders were used and differences were solved through consensus and confirmability was assured by follow-up interviews with participants and member checking. Respondent validation was also done by giving the transcribed texts to two of the FGDs, three of IDIs and two of the KIIs participants to read and check if points were well captured. Then the texts were translated in to English and entered to Opencode software

6.2. External validity

In addition, the finding might not be generalizable to the whole country, as data were collected from urban area. However, the findings can be generalizable to other urban contexts with caution. Since the health care system organizations in general and ART units in particular are similar in Ethiopia; the finding may contain information that can be reasonably informative about fertility and contraceptive use of HIV positive women attending health facilities.

7. STRENGTHS AND LIMITATIONS

7.1. Strength

One of the major strengths of this study was the use of different methods (quantitative and qualitative) could facilitate a comprehensive understanding from different perspectives and produce comprehensive picture of the reality on fertility and contraceptive preference and change in fertility intentions of HIV positive women following ART initiation.

The other strength of this study is focuses on HIV positive women who need specific attention due to increased biological susceptibility, stigma because of their sero-status, lack of support from husband, family, community and providers. Hence, this study attempted to assess effect of ART on fertility and contraceptive decisions of HIV positive women separately to show existing problem in to picture.

Important confounding variables were identified and controlled in regression analysis.
Quality of data maintained at high level, and preliminary results were presented; as a series of seminars at the school of Public Health, AAU. The use of qualitative software (Open code) for coding the qualitative information enabled to fined themes from a couple of transcripts.

7.2. Limitations

As the data were collected from clinical setup, the response might have been affected by social desirability bias that might in turn have affected the validity of the result. Furthermore, as the information depended on self-reported response of participants, there may be reporting errors and recall biases. Although every effort was made to ensure that their responses would be confidential, the possibility remains that some may under report as contraceptive issues are considered taboo in Ethiopia. The fact that the design was cross-sectional might hinder the determination of causality of relationship.

On the other hand, the information was limited to reflection of HIV positive women aged 18-49 years, and did not include HIV positive men this might preclude the result, also limited to urban residents which excludes the situation of women in the rural areas of our country.
In follow up study a potential limitation of this study is relatively short duration of follow up (12 months), lacks control group, limiting its rigor and assessment was limited only on two points.

8. CONCLUSIONS

The results of both the quantitative and qualitative studies have identified a number of issues with important policy and programmatic implications. Factors like ART use, young age, presence of partner and disclosure of HIV status were associated with fertility intentions of HIV positive women.

The study identified that HIV positive women in general and women receiving ART in particular are more likely to use contraceptives with preference of male condom, injections and oral contraceptive pills. Dual contraceptive method use was negligible among the study subjects.

Furthermore, having one or more living children, disclosure of HIV status to sexual partner, open discussion with partner found to be predictors of contraceptive use in the study area. There was range of reasons as to why HIV positive women selected the methods such as it protects from HIV/STIs, convenient to use, prevents pregnancy, advice of health care workers and the like.

We found evidence of change in fertility intentions among HIV positive women that starts soon after ART initiation. Fertility and contraceptive decisions of women are influenced by presence of ART, partner desire, family and community perception and associated stigma, as being childless is taboo and considered as women's responsibility. Many participants indicated that health workers are supportive in offering information more on preventive methods rather than discussing fertility and contraceptive options.

9. RECOMMENDATIONS

As access to ART increases in Ethiopia, issues like fertility and contraceptive need to be addressed in order to enhance expected outcome of comprehensive HIV care. Policies/ programs related to reproductive health should address not only the prevention of HIV and unplanned pregnancies but also should consider the fertility needs of HIV positive women.

9.1. Operational recommendation

Early times of ART initiation are important for women to plan and get options and the opportunity should not be missed due to fear of disclosure and other related problems. It is wise to integrate SRH issues including family planning counseling with ART services where PLWH can get easily**.** Further more, ART sites are entry points to reinforce options; women should be consistently counseled, and offered regularly free and comprehensive family planning services and wide range of options along with their regular follow up, so that women may decide freely and responsibly on their fertility issues.

The contraceptive use of women in the study area mainly dependent on male condom use; which is commonly available method in ART units, this indicates emphasis should be given to dual contraceptive methods use along with their regular follow up irrespective of their ART use.

There is a need to empower women intheir negotiation skilles and able to express themselves while dealing safer sex. Moreover, health care providers and others working on the area should think wider than the ordinary preventive messages to the consideration of fertility need and contraceptive options, so that women can feel accepted and valued.

Health workers should stop imposing their own beliefs on clients and embrace ethics of care so that they assist HIV positive women to identify their reproductive options. In addition, health systems must be improved, to provide special sexual and reproductive health services tailored to PLWH, particularly those HIV positives women.

In the clinical setup primarily health care providers should be familiar with updated knowledge and practices that solve the problem of women. Providers should follow the messages provided to women especially from peer educators and mother support group working in each health institution. Health workers should teach and empower those service providors to enhance communication skills and with updated information that can satisfy the needs of women living with HIV

9.2. Policy recommendations

Fertility and family planning programs tailored for PLWH are critical but also for HIV positive women to help reduce the rapid change of fertility intentions which puts them at risk of both HIV and unwanted pregnancies. Furthermore, it is critical to include PLWH in general and HIV positive women in particular with special fertility needs in the National Policy on Sexual and Reproductive Health and Rights, but also it is vital to include them to contribute to establishing programmes for their needs.

Potential use of the current structures such as urban health extension workers (UHW), model families, peer educators, adherence supporters and mother support group could be important means to promote fertility and contraceptive need of women living with HIV. For the effectiveness health extension workers should be trained with due emphasis of women living with HIV and mobilization of the community in building self confidence through awareness creation. Furthermore, Policies and guidelines that empower health workers with resources, information, skills and sensitivity training related to the specific needs of HIV-infected people cannot be over-emphasized. One possibility is to look at and modify the reproductive health counselling content to ensure that the HIV positive women counselling that stresses the importance of consistent fertility choices as a means of preventing both unwanted pregnancy and HIV transmission

9.3. Future research

A number of priority areas of future research on this topic, effect of ART on fertility intentions and contraceptive use of HIV positive women, first, conducting the study in rural setting and different contexts in the country will help to view from different perspectives. Furthermore, there is a need to conduct large observational cohort study that enrolls women at various stages of HIV diseases and reproductive lives. Second, important to consider longitudinal study that can assess the ongoing impact of ART access on fertility and contraceptive preference of HIV positive women. It is also important to investigate the potential influence of ART on incidence of pregnancy and change in preventive practices with the involvement of partner.

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11. REFERENCE

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12. ANNEXES

ANNEX 1. PICTURES USED FOR FOLLOW-UP STUDY



Figure 7: Identification mark attached on patients' card, Addis Ababa, 2013

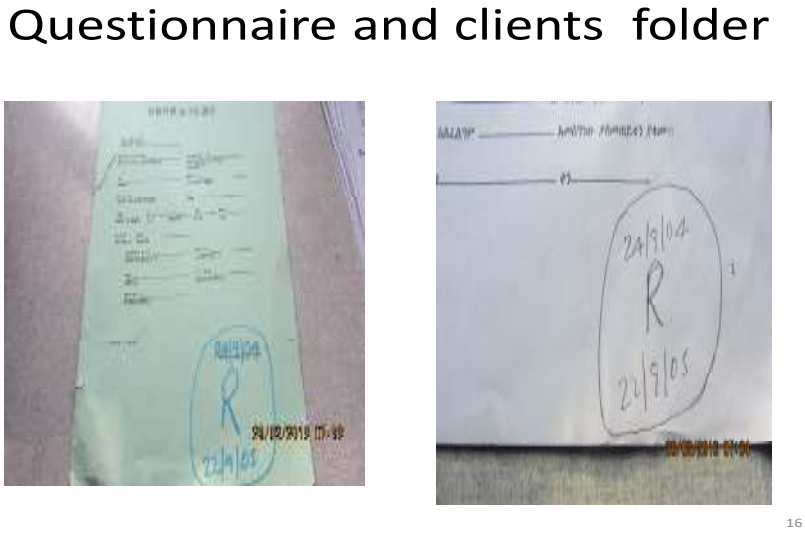


Figure 8: Clients cared and questionnaire with identification mark attached on, Addis Ababa, 2013

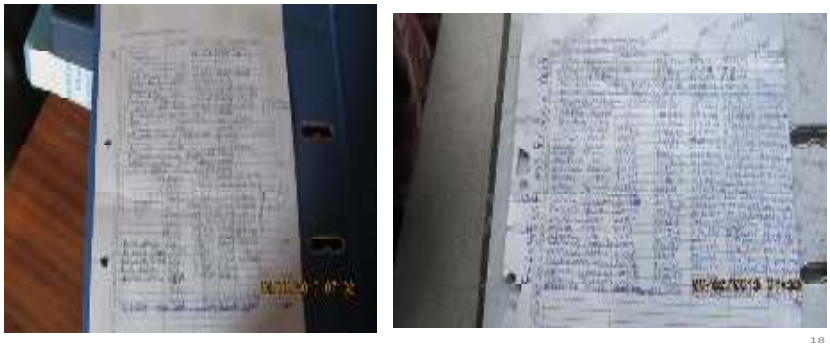
Follow up format for fertility study

Nº	Name of client	Unique ART nº	card nº	base line date	appointment date	client address: cell phone, other
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

17

Figure 9: Follow up format attached on folder, Addis Ababa, 2013

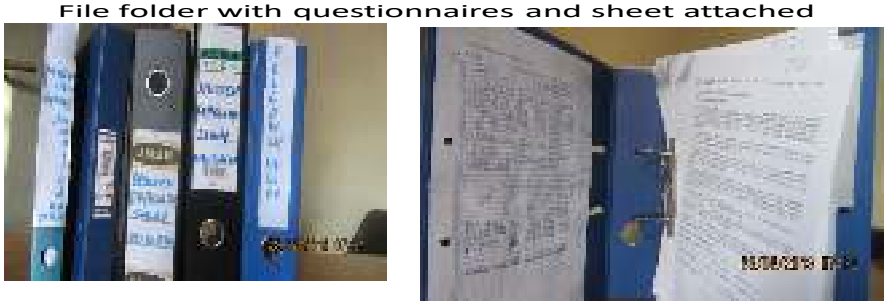
Folder with follow up sheet



18

Figure 10: Folder with follow up sheet, Addis Ababa, Ethiopia, 2013

File folder with questionnaires and sheet attached



19

Figure 11: File folder for the follow up study, Addis Ababa, Ethiopia, 2013

ANNEX 2: SURVEY QUESTIONNAIRES

ANNEX 2.1. ENGLISH VERSION OF THE QUESTIONNAIRES:

Addis Ababa University

College of Health Science

School of Public Health

Effect of ART on Fertility Intention and contraceptive use among HIV positive women in Addis Ababa Ethiopia

PART I: TOOLS FOR CLIENT SURVEY

ENGLISH VERSION OF THE INFORMATION SHEET:

1. Introduction

Hello my name is _____I am working with research team working on Effect of ART on fertility intention and contraceptive use among HIV positive women in Addis Ababa, **Objective of the Study:** The main aim of the research project was to assess effect of ART access on fertility Intention and contraceptive use among HIV positive women attending health care facilities. The information you provide will be used to improve fertility services to HIV positive women in Addis Ababa; the survey asks you question about your fertility intension, contraceptive use and prevention issues.

2. Participation Procedure and Guideline:

a. The information you provide will be kept completely anonymous. That is, your name will not be indicated on any of the forms.

b. It will take about 60 minutes to complete the survey. Nevertheless if you do not want to participate in the study it is your right and has no influence on the care being provided in this health institution or other areas

c. Since the questions are prepared in Amharic, the discussion will be in Amharic and the interviewers will ask you in the language that you are familiar with.

3. Participation Benefits and Risk:

a. **Risk:-**Your participation in this study does not involve risks to you than those you experience in your daily life. You might feel some mild discomfort in responding question and the time you spent, but it is not different from your appointment time.

b. **Benefits: -** you may experience some benefits from participating in the project. These benefits might be positive feelings from helping with important research project and your response will assist in improving health care delivery to HIV positive women in health institution in Addis Ababa.

c. **Incentives/Payment for Participation:** No payment will be given in participating in this stud.

4; Confidentiality: The information gathered from you will be **confidential** and will not be exposed to anybody. The information will be stored in secured place locked by using coded identification without indicating your name.

5, Right to Refuse or withdraw: your participation is **Voluntary**, and there is no penalty for you not wanting to participate. This means that you are free to stop fully or choose not to answer any particular question or all questions**.**

6. Right as a participant: You have a right to have any questions about this research project answered. Please direct any question to **Ato Hussen Mekonnen**, School of Public Health, College of Health Science; Addis Ababa University. Call phone: **+251 911631634**. E-maile: hussen_mk@yahoo.com

Ethical clearance will be obtained from IRB of Faculty of Medicine, Addis Ababa University.

7, Informed Consent Form: with do understanding of the aforementioned information, are you willing to participate in the study?

1. If Yes_____ (continue the interview) 2. No_____ (Terminate the interview)

Signature of the participant _____Date: _____

Part I: English Version of the Consent Form

In signing this document, I am giving my consent to participate in the study entitled" Assessing effect of HAART access on fertility intention and contraceptive use among HIV positive women attending health institutions in Addis Ababa, Ethiopia.

I have been informed that the purpose of this particular research project is to assess fertility intension and contraceptive use of HIV positive women attending health institutions in Addis Ababa. I understand that I am selected to participate in this study randomly from HIV positive women attending health institutions; I am also informed that eligible for this study.

I have been informed that participation in the study is entirely voluntary, I can refuse from participating fully or partially and to terminate at any time. I have been told that my answers to questions will not be given to anyone else and no reports of this study will ever identify me in any way. I have also been informed that my participation or non participation or my refusal to answer questions will have no effect on me or on the service that I can get. I am told that the question will take 45-60 minutes to complete the survey.

I have been informed that no monetary incentives will be given for my participation in this study. I understand that participation in this study does not involve risk. The study will help in developing appropriate fertility and prevention systems and strengthen the current HIV prevention, care and support activities, build safe pregnancy and avoid unintended pregnancy.

I understand that the results of this research will be given to me if I ask for them and **Hussen Mekonnen** is the contact person if I have questions about the study or about my rights as a study respondent. Hussen can be reached through a call at **+251 911 631634.**

Respondent's signature_____ Date _____

Thank You!

This part of the questionnaire sub classified by 8 sections, the description of each session indicated as follows

Section 1.1: Socio-Demographics status

Under this section contains independent variables such as age, income, educational background, marital status. It will be instructed as. I would like to ask you questions about you and your family.

Section 1.2: HIV Status

Now I'd like to ask you some questions about your HIV-status

Section 1.3: ART History:

Under this section I will ask you about your ART status and history of ART initiation

Section 1.4: Fertility Desires/Intention

Now I would like to ask you questions about your wishes to have (more) children

Section 1.5: Fertility Decision:

Now I would like to ask you some questions about your pregnancy and sexual history. Some of these questions may be personal. If you feel embarrassed and don't want to continue, you can say so and we'll skip to other questions. I want to remind you that all your answers are confidential.

Section 1.6: Use of prevention methods (contraceptive methods)

In this section, I would like to ask you questions about your sexual activity and use of prevention (contraception).

Section 1.7: Sexual History:

Now I'd like to ask you questions about your sexual partners and your sexual activity. Some of these questions might make you feel uncomfortable; however, it is really important that you answer the questions honestly. Please remember, that all your answers are confidential and no one will know your responses. The number of sexual partners people have varies from person to person. There is no right or wrong number

Section 1.8: MEDICAL RECORD REVIEW:

Please extract the following information from the participant's medical record.

PART 1: QUESTIONNAIRE TO ASSESS EFFECT OF HAART ON FERTILITY INTENTION OF HIV POSITIVE WOMEN, ADDIS ABABA, ETHIOPIA, 2012

01. Code Number of questionnaire _____

02. Name of the Interviewer_____ signature_____

03. Date of interview _____ (dd) _____(mm) , year, 2011/12

04. Checked by Name _____ signature_____

05. Date of cheek _____(dd)_____(mm),year 2011/2012

2. Identification of Health facility

2.1. Name health facility_____

2.2. Region_____2.2. Kifle Ketema _____2.3. Woreda _____2.4. Kebele_____

3. Ownership of health facility **:**

3.1. Government _____3.2.NGOs_____ 3.3. Other (Specify) _____

4. ART code number: _____

5. Patient card number _____

Table 1: Questionnaires used to assess socio-economic status of the study subjects, Addis Ababa, Ethiopia, 2012.

No	QUESTIONS AND FILTERS	Coding Category	SKIP
101	How old are you	_____ years	
102	What is your ethnicity?	Amhara----------1 Oromo----------2 Guragea----------3 Tigrie----------4 Silte----------5 Gamo----------6 other specify ---------89	
103	What is your religion?	Orthodox----------1 Muslim----------2 Protestant----------3 Catholic----------4 Others specify _____89	
104	What is your Educational Status?	_____ grade completed Illiterate----------1 Can read and write--------2 1-8 grade completed------3 8-12 grade completed----4 Above 12 grade----------5	
105	How much is your monthly income in Birr	no income ---------- 1 Below 500----------2 501-1000----------3 1001-3000----------4 above 3000----------4 other specify_____ 89	
106	What is your Occupation?	Unemployed ----------1 Student ----------2 House wife ----------3 House maid ----------4 Daily laborer ----------5 Merchant ----------6 Commercial sex worker-----7 Government employee -----8 Private business ----------9 Other specify_____89	
107	What is your Marital Status?	Single ---------- 1 Married ---------- 2----------→ Divorced ---------- 3----------→ Widowed ---------- 4----------→ Unmarried but living together --------- 5	 108 110 111
108	If Married, How old were you when you were first married?	_____ years	
109	Are you the only wife or does your husband have co-wives?	I am the only wife ----------1 → My husband has co-wives--2	

110	If Divorced or Separated: How old were you when you were first married?	._____years ----------1 Do not Know ----------2 Refused ----------3	
111	If widowed: When did your husband die?	day___ month __year ___	
112	Please specify the cause of death	----------	
113	How many children do you have?	_____	

Section 1.2: HIV STATUS
Now I'd like to ask you some questions about your HIV- Status

No	Question and Filter	Answers and coding	Skip
201	When you were first diagnosed with HIV?	_____date_____month ____ year I do not remember-----1 No answer----------2 Other specify ----------89	
202	For what reason did you undergo HIV testing? (Tick only one)	Pregnant/tested at antenatal clinic------1 Marriage ----------2 Recommended by health care professional ----------3 Was sick/having symptoms of HIV/AIDS -4 Sexual partner got sick/had symptoms of HIV/AIDS----------5 Sexual partner asked that I get tested ----6 Just wanted to know status ----------7 Sexual partner has risky behavior----8 Donated blood ----------9 Sexual contact with a known HIV-positive individual ----------10 Don't know ----------11 Other, specify ----------89	
203	Do you currently have a sexual partner?	Yes---------1 No ---------2----------→	207
204	Do your partner/husband tested for HIV?	Yes----------1 No----------2----------→ I do not know----3	206
205	If he tested what was the test result?	Positive----------1 Negative----------2 I do not know ----89	
206	Did you disclose your sero status to your partner?	Yes----------1 No ----------2	
207	How many children do you have	____ # of alive children -------1 I do not have children----2 ----------→ Other specify ----------89	209
208	Currently How many alive children do you have?	_____ # alive children -------1 No alive children -------2 No answer ----------99 Other specify ----------89	
209	Do you have chilled who died of HIV?	Yes----------1 No ----------2 Unknown ----------97	
210	Did you test your child (en)?	Yes----------1 No ----------2	

DISCLOSURE OF SERO STATUS

Now we're going to talk about **disclosure**. Different people do different things when they find out the result of their HIV test. Some people tell their friends, families and sexual partners, while other people don't tell anyone. Please remember that I won't tell anyone what you tell me in this interview.

211. Have you ever told anyone about your HIV status? 1. Yes 2. No ---------→ section 3

212. Who have you told about your HIV status? Was the response from this person supportive, non-supportive or neutral? (*Please tick all that apply below and indicate responses for people told.*)

Questions	Supportive	Non supportive	Neutral
1. Husband			
2. Boyfriend			
3. Sexual partner			
4. Mother			
5. Father			
6. Sister			
7. Brother			

Section 1.3: ART History:

Under this section I will ask you about your ART status and history of ART initiation

No	Questions and Filter	Answers and coding category	skip
301	Are you currently on Antiretroviral to treat your HIV Infection?	Yes----------1 No ----------2 ----------→ 303	
302	What is the duration after you have started ART (in month)	_____ month_____ year I do not remember ----------1 No answer ----------89 Other specify ----------99	
303	Are you aware of medications to treat HIV/AIDS called antiretroviral therapy? Sometimes called HIV-drugs?	*yes ----------1* *no ----------2--* → *unsure/DK---------3--* →	305
304	What type of ARV medication are you currently on? (*Interviewer: Please support them to list the medications that they are taking)*	----------	
305	What is your current CD_4 cell count?	_____ cells/mm^3	
306	In your opinion, how do you express your health condition after you have started ART?	Improved ----------1 No change ----------2 Worsen ----------3 No answer ----------99 Other specify ----------89	
307	In your opinion, how do you express your health condition before a year?	Improved ----------1 No change ----------2 Worsen ----------3 No answer ----------99 Other specify ----------89	

Section 1.4: Fertility Desires/Intension

Now I would like to ask you questions about your wishes to have (more) children

No	Questions and Filter	Answers and coding category	skip
401	Are you sexually active?	Yes----------1 No ----------2	
402	How long have you been with your current partner?	Before sero positive ----1 After sero positive--------2	
403	Are you currently pregnant?	Yes----------1 No ----------2 I do not know----------3 Other specify ----------89	
404	Do you want to have a/more child (en) in the future?	Yes ----------1-------→ Wanting no more ----------2--------→	708 709
405	When do you want more child/en?	After ___ month ____year----1 I do not know----------2 Other specify ----------89	
406	How many children do you want to have?	_____ # children	
407	How many more children do you want to have in the future?	_____ # children	
408	Why do you want more children?	Presence of ART ----------1 My health condition improved---2 Recent marriage ----------3 My husband insisted me ----------4 Health workers advice ----------5 Other specify ----------89	
409	Why you do not want to have more children?	I have enough number of children---1 Fear of viral transmission ----------2 No enough income ----------3 By the advice of health workers –----4 Fear of the pregnancy related health problem----------5 Other specify ----------89	
410	Do your partner would like to have child(en)	Yes----------1 No ----------2 I do not Know ---------3 I had no partner--------4 Other specify ----------5	
411	Is there any member of the family who influences you to have children	Yes----------1 No ----------2	
412	Who influences you?	My family----------1 My husband's family ----------2 Other specify ---------- --89	

Section 1.5: Fertility Decision

Now I would like to ask you some questions about your pregnancy and sexual history. Some of these questions may be personal. If you feel embarrassed and don't want to continue, you can say so and we'll skip to other questions. I want to remind you that all your answers are confidential

No	Questions and Filters	Answers and coding category	Skip
501	When do you want to have fertility?	**_____month--------Year**	
402	Who decides when to have fertility?	My self ---------- 1 My husband --------2 Bothe of us --------- 3 Other specify -------89	
503	Have you ever discussed with your husband about fertility issues?	Yes----------1 No ----------2	
504	Have you ever discussed about fertility issues with health workers?	Yes----------1 No ----------2	
505	How is the influence of your family?	Always ----------1 Not at all ----------2 Sometimes----------3	
506	Have you ever get counseling services on fertility?	Always ----------1 Not at all ----------2 Sometimes ----------3	
507	Where do you get the counseling service?	Health workers --------1 Mass media----------2 Friends----------3 Other specify----------89	
508	Have you ever been told by a health care worker that you should not become pregnant because of your HIV status?	*yes* ----------*1* *no* ----------*2* *unsure*----------*3*	

Section 1.6: Use of prevention methods (contraceptive methods) and preference:

In this section, I would like to ask you questions about your sexual activity and use of prevention (contraception) and your preference

No	Questions and filters	Coding category	skip
601	Have you had vaginal sex in the last 6 months?	Yes----------1 No ----------2	
602	Have you ever had an operation to avoid having any more children?	Yes ----------1 No ----------2	
603	In the last 6 months, have you used anything to prevent becoming pregnant, such as, condoms, pills, injectables, loop, hysterectomy (removal of the uterus), vasectomy (man has his tubes tied), or other methods?..... (*Interviewer: Probe for condoms*)	Yes----------1 No----------2----------→	905
604	What type of prevention methods have you used in the last 6 months? Please select all that apply. *(Interviewer: If hysterectomy or sterilization, please note what month + year)*	Pill (Oral contraceptive)------1 Injectables/Injection----------2 Loop/IUD----------3 Implant----------4 Diaphragm----------5 Condom (Male)----------6 Female Condom----------7 (Depo-Provera or Nuristerate)----8 Hysterectomy---------9----→ Female sterilization---10--→ Male Sterilization -----11---→ Other, specify_____89	Date
605	In the last 6 months, how frequently did you use a condom when having sex? Tick only one. *(Interviewer: Read options)*	Never, none of the time---1 Rarely, once in a while-----2 Sometimes, about half of the time-3 Frequently, more than half of the time---4 Always, every time-------5 Refused to answer------97	
606	What is the main reason you chose the method of prevention you use most consistently?_____ Specify methods	It is easy to use----------1 It is convenient/more convenient-2 It does not interfere with sexual activity-3 It protects against transmission of sexual--4 transmitted diseases and HIV/AIDS-5 It is good at preventing pregnancy-6 My partner won't find out I'm using prevention---7 I can use it only when needed It is cheap----------8 It has few or no side effects----9 A doctor or nurse recommended it---10 My friends use it----------11 My partner wants me to use this type of prevention----------12 My partner won't use birth control himself-13 I can decide when to use it and when not to--14 Other, specify ___89	

607	Why haven't you used any prevention methods in the last 6 months?	I am pregnant,----------1 I am trying to become pregnant--2 I can get an abortion if I become pregnant----------3 I don't think I will become pregnant------4 I am not having sex--------5 I don't mind becoming pregnant-6 I don't believe in using prevention--7 I don't know why/No reason-8 I cannot become pregnant (I am infertile)----------9 My partner will not use and/or will not let me use prevention--10 I just had a baby--------11 Health related side effects of prevention methods (e.g. weight gain, abnormal periods, headaches, other health effects)---------12 Other (specify) _____89	

Section 1.7: Sexual History:

Now I'd like to ask you questions about your sexual partners and your sexual activity. Some of these questions might make you feel uncomfortable; however, it is really important that you answer the questions honestly. Please remember, that all your answers are confidential and no one will know your responses. The number of sexual partners people have varies from person to person. There is no right or wrong number

701. In your lifetime, with how many different men have you had vaginal sex? Again, by vaginal sex, I mean when a man puts his penis in a women's vagina. Please include your husband, regular partner and casual partners' _____

1. _____ # of men if zero skip to question 703 other wise continue to 702
2. Don't know

702. In the past 6 months, with how many different men have you had vaginal sex? Please include your husband, regular partner and casual partners....

1._____ # men, if zero skip to 704 if not continue

2. Do not know

703. Why haven't you had sex?_____ go to section 7

704. I'd like to ask you some questions about your male sexual partner(s). You mentioned that you had _____ male sexual partners in the past six months. Please answer the following

questions starting with your most recent partner. *(Interviewer: The following questions only apply to women who have had sex in the past 6 months).*

Questions and *Filter*	Part 1	Part 2	Part 3	Part 4
1) What relationship do you have with this sexual partner? (Please refer to code list below)	☐	☐	☐	☐
2) Can you tell me the number of times you've had sex with this partner in the last 30 days?	____ # times or Do not know	____ # times or Do not know	____ # times or Do not know	____ # times or Do not know
3) How many times have you used a condom with this partner in the last 30 days?	____ # times or Do not know	____ # times or Do not know	____ # times or Do not know	____ # times or Do not know
4) Do you know the HIV status of your partner?	Yes → go to 5 No →6 DK--→6	Yes go to 5 No→6 DK→6	Yes→go to 5 No→6 DK→6	Yes→go to 5 No-→6 DK-→6
5) What is your partner's HIV status?	Positive →6 Negative →7	Positive →6 Negative →7	Positive →6 Negative →7	Positive →6 Negative →7
6) Is your partner currently taking ARVs?	Yes No DK	Yes No DK	Yes No DK	Yes No DK
7Does your partner knows Your HIV status?	Yes No	Yes No	Yes No	Yes No
Codes: 1 = Husband, 2 = Regular sex partner, 3 = Casual sex partner, 4 = Commercial sex partner, 5 = One time encounter, 6 = Other				

That was the final question. Thank you for participating in this study and for answering these questions**.**

Interview stop time: *HH* _____*MM*_____ (24 Hours Clock)

SECTION 1.8: MEDICAL RECORD REVIEW (secondary Data)

Please extract the following information from the participant's medical record. HIV-negative women do not need to undergo medical record review.

1. Date of Record Review _____ day_____ month_____ year
2. Name of reviewer:_____
3. Name of health institution? _____
4. Date of first HIV diagnosis _____day _____ month _____ year 2. not available
5. Most recent CD4 count _____ (cells absolute count) 2. Unavailable → to question 6
   5.1 Date drawn.....
6. Lowest (nadir) CD4 count_____ (cells absolute count) 2. Unavailable → go to question 7
   6.1 Date drawn.....
7. Most recent viral load measure _____ (Cells absolute count) 2. Unavailable to 8
   7.1 Date drawn.....
8. WHO Staging circle the number
   1. Stage I Stage II Stage III Stage IV
   2. Not enough information_____ write Reason

ANNEX: 2.1.2: PART II: TOOLS FOR FOLLOW UP STUDY

ENGLISH VERSION OF THE INFORMATION SHEET:

1. Introduction

Hello my name is _____I am working with research team working on Effect of HAART access on fertility intension and contraceptive use among HIV positive women in Addis Ababa, **the purpose of the study** is to assess change in fertility Intention along the duration of HAART and the information that you offer will be beneficial to improve services for HIV positive women in Addis Ababa.

2. Participation Procedure and Guideline:

a. The information you provide will be kept completely anonymous. That is, your name will not be on any of the forms.

b. It will take about 30 minutes to complete the survey. Nevertheless if you do not want to participate in the study it is your right and has no influence on the care being provided in this health institution or other areas. The information will be collected two times in six months interval.

c. Since the questions are prepared in Amharic, the discussion will be in Amharic and the interviewers will ask you in the language that you are familiar with.

d. Information will be collected for two times in six month intervals and the appointment will be in line with your follow up time and the information will be collected when you come for your appointment.

3. Participation Benefits and Risk:

- **Risk:** Your participation in this study does not involve risks to you than those you experience in your daily life. You might feel some mild discomfort in responding question and the 30-35 minutes time you spent, but it is not different from your appointment time.

- **Benefits:** you may experience some benefits from participating in the project. These benefits might be positive feelings from helping with important research project and your

response will assist in improving health care delivery to HIV positive women in health institution in Addis Ababa.

- **Incentives/Payment for Participation:** No payment will be given in participating in this study.

4. **Confidentiality:** The information gathered from you will be **confidential** and will not be exposed to anybody. The information will be stored in secured place locked by using coded identification without indicating your name.

5. **Right to Refuse or withdraw:** your participation is **Voluntary**, and there is no penalty for you not wanting to participate. This means that you are free to stop fully or choose not to answer any particular question or all questions**.**

6. **Right as a participant:** You have a right to have any questions about this research project answered. Please direct any question to **Ato Hussen Mekonnen**, School of Public Health, College of Health Science Addis Ababa University. Call phone**: +251 911631634,**.e-maile: hussen_mk@yahoo.com

Ethical clearance will be obtained from IRB of Faculty of Medicine, Addis Ababa University.

7. **Informed Consent Form**: with do understanding of the aforementioned information, are you willing to participate in the study?

1. If Yes_____ (continue the interview) 2. No_____ (Terminate the interview)

Signature of the participant _____Date: _____

Part II: ENGLISH VERSION OF THE CONSENT FORM

In signing this document, I am giving my consent to participate in the study entitled" Assessing effect of HAART access on fertility intention and contraceptive use among HIV positive women attending health institutions in Addis Ababa, Ethiopia.

I have been informed that the purpose of this particular research project is to assess change in fertility intension as the duration of ART increases among HIV positive women attending health institutions in Addis Ababa. I understand that I am selected to participate in this study randomly from HIV positive women attending health institutions; I am also informed that eligible for this study.

I have been informed that participation in the study is entirely voluntary, I can refuse from participating fully or partially and to terminate at any time. I have been told that my answers to questions will not be given to anyone else and no reports of this study will ever identify me in any way. I have also been informed that my participation or non participation or my refusal to answer questions will have no effect on me or on the service that I can get. I am told that the question will take **30-35** minutes to complete the survey.

I have been informed that no monetary incentives will be given for my participation in this study. I understand that participation in this study does not involve risk. The study will help in developing appropriate fertility and prevention systems and strengthen the current HIV prevention, care and support activities, build safe pregnancy and avoid unintended pregnancy.

I understand that the results of this research will be given to me if I ask for them and **Ato Hussen Mekonnen** is the contact person if I have questions about the study or about my rights as a study respondent. Hussen can be reached through a call at **+251 911 631634**.

Respondent's signature_____ Date _____

Thank You!

In this follow up study there are three sections that will assess socio-demographic status, fertility intension and record review on key indicators

Section 2.1.Socio-demographic situation

Under this section I will ask about you and your family

Section 2.2: Change in Fertility intension

In this part I will ask you about your fertility intension at each subsequent contact, it will also ask influencing factors

Section 2.3: formats about key issues related to ART use

Under this lists there are points filed after asking patients and others could be recorded from the patient document

Instructions for the data collectors:

STEP I: identify HIV a positive woman's who came for the ART and pre ART follow up.

STEP II: Get consent for inclusion in the follow-up.

Read the consent form, and then get her willingness to participate.

STEP III. Record background information with accurate address and appoint her for the next interview.

STEP IV. Continue asking the main questionnaire.

STEP V: Conduct the second interview with the same questionnaires except SES and WHO staging after 12 months of the first interview and then finish the study

.

QUESTIONNAIRES

Code Number of questionnaire _____

01-Name of the interviewer _____Signature_____ date____ (mm)___year__

02-Checked and edited by Name _____ signature_____ Date____ (mm)___ year____

3. Name/type of health facility_____

4. Location of Health facility

1. Region_____4.2. Kifle Ketema _____4.3. Woreda _____4.4. Kebele_____

4. Address of Participant

1. City :_____
2. Kifle Ketema _____.
3. Kebele _____
4. Hose Number_____
5. Telephone: Home_____ Mobile _____office:_____
6. Other directions(like name of specific area) :_____
7. Home based care giver if any_____
8. Peer educator if any_____
9. ART code No if started _____
10. Patient card number _____

2.1: SOCIOECONOMIC STATUS OF THE PARTICIPANTS, ADDIS ABABA, 2012

Under this section I will ask about you and your family

No	QUESTIONS AND FILTERS	Coding Category	SKIP
331	How old are you	_____ years	
332	What is your ethnicity?	Amhara----------1 Oromo----------2 Guragea----------3 Tigrie----------4 Silte----------5 Gamo----------6 other specify ----------89	
333	What is your religion?	Orthodox----------1 Muslim----------2 Protestant----------3 Catholic----------4 Others specify _____89	
334	What is your educational status?	_____ grade completed Illiterate----------1 Can read and write--------2 1-8 grade completed------3 8-12 grade completed----4 Above 12 grade----------5	
335	How much is your monthly income in Birr	Dependent----------1 Below 500----------2 500-1000----------3 1001-3000----------4 above 3000----------5 other specify_____89	
336	What is your Occupation?	Unemployed ----------1 Student ----------2 House wife ----------3 House maid ----------4 Daily laborer ----------5 Merchant ----------6 Commercial sex worker------7 Government employee -------8 Private business----------9 Other specify_____89	
337	What is your marital status?	Single ……1 Married/cohabited ……..2 Widowed ……..3 Divorced ……4	

SECTION 2.2: CHANGE IN FERTILITY INTENTION

In this part I will ask you about your fertility intension at each subsequent contact, it will also ask influencing factors

Instruction to data collectors: This is prepared for follow up study at each visit the patients will be asked and the responses cod number will be filled at each visit provided below.

No	Questions and Filter	Answers and coding category	skip
031	Are you sexually active?	Yes----------1 No ----------2	
032	Currently do you have a child(en)	Yes----------1 No ----------2----------→	034
033	How many children do you have?	_____ # children	
034	Do you want to have a/more child (en) in the future?	1. Yes ---------- 2. Wanting no more	708 709
035	When do you want more child/en?	After ___ month____ year----1 I do not know----------2 Other specify ----------89	
036	How many more children do you want to have in the future?	_____ # children	
037	Why do you want more children?	Presence of ART ----------1 My health condition improved---2 Recent marriage ----------3 My husband insisted me ----------4 Health workers advice ----------5 Other specify ----------89	
038	Why you do not want to have more children?	I have enough number of children---1 Fear of viral transmission ----------2 No enough income ----------3 By the advice of health workers –----4 Fear of the pregnancy related health problem----------5	
039	Currently do you use contraceptives	Yes ----------1 No ----------2	
040	What type of contraceptives do use?(list)	_____	
041	Do your partner would like to have child(en)	Yes----------1 No ----------2 I do not Know ---------3 I had no partner---4 Other specify ----5	

042	Is there any member of the family who influences you to have children	Yes---------1 No ---------2	
043	Who influences you?	My family----------1 My husband's family -----2 Other specify ---------- --89	
044	Did health workers ever counsel you about pregnancy and contraceptive issues?	Yes----------1 No----------2	
045	Have you ever asked them?	Yes----------1 No ----------2	

Section 2.3: Formats about key issues related to ART use

Under this lists there are points filed after asking patients and others could be recorded from the patient document

Instruction for data collectors: Using the following table please ask the patient and counter cheek the patients chart at each visit and put the result you get on the space provided, few questions may continuation of the previous

No	Questions and checklists	Visiting periods	
		1st contact	2nd contact
001	What is the current CD4 count?		
002	How long after you have started ART?		
003	What is the current weight?		
004	What is your partner's sero status?		
005	Have you disclosed your sero status to your partner?		
006	Do You take your drugs correctly?		
007	Is there any side effect while taking a drug		
008	How do you explain your health condition?		

This is the end of our follow up, if you have any additional idea that you want to add?

Thank you very much for your participation

We have finished our follow up

ANNEX 2.1.3: QUALITATIVE PART OF THE QUESTIONNAIRE

To assess fertility and contraceptive decision-making and support for women living with HIV in Addis Ababa: positive women and providers experiences and perceptions

3:1. ENGLISH VERSION OF THE INFORMATION SHEET.

1. Introduction

Hello, my name is _____ I am a member of research team conducting research entitled assessing effect of HAART access on fertility intention and contraceptive use among HIV positive women. **The purpose** of this study is to assess fertility and contraceptive decision-making and support for women living with HIV in Addis Ababa: positive women and providers experiences and perceptions. Your participation in this survey will be important to improve the services provide to HIV positive women in health institutions of Addis Ababa.

2. Participation procedure and guideline:

a. The information you provide will be kept completely anonymous. That is, your name will not be on any of the forms.

b. It will take about 60 minutes to complete the survey. Nevertheless if you do not want to participate in the study it is your right and has no influence on the care being provided in this health institution or other areas'

c. Since the questions are prepared in Amharic, the discussion will be in Amharic and the interviewers will ask you in the language that you are familiar with.

d. The data will be collected through discussion and for ease of discussion it will be tape recorded and your name will not be called throughout the discussion and recorded document will be deleted after important concepts translated. Since no name was indicted we used coded name that could be important for discussion.

3. Participation Benefits and Risk:

a. Risk: - Your participation in this study does not involve risks to you than those you experience in your daily life. You might feel some mild discomfort in responding question and the 45 minutes time you spent

b. **Benefits: -** you may experience some benefits from participating in the project. These benefits might be positive feelings from helping with important research project and your response will assist in improving health care delivery to HIV positive women in health institution in Addis Ababa.

c. **Incentives/Payment for Participation:** No payment will be given in participating in this stud.

4. **Confidentiality:** The information gathered from you will be **confidential** and will not be exposed to anybody. The information will be stored in secured place locked by using coded identification without indicating your name.

5. **Right to Refuse or withdraw:** your participation is **Voluntary**, and there is no penalty for you not wanting to participate. This means that you are free to stop fully or choose not to answer any particular question or all questions**.**

6. **Right as a participant:** You have a right to have any questions about this research project answered. Please direct any question to Hussen Mekonnen, School of Public Health, College of Health Science, Addis Ababa University. Call phone: +251 911631634.e-mail: hussen_mk@yahoo.com

Ethical clearance will be obtained from IRB of Faculty of Medicine, Addis Ababa University.

7. **Informed Consent Form**: with do understanding of the aforementioned information, are you willing to participate in the study?

   1. If Yes_____(continue the interview) 2. No_____ (Terminate the interview)

Signature of the participant _____Date: _____

PART III: ENGLISH VERSION OF THE CONSENT FORM

In signing this document, I am giving my consent to participate in the study entitled" Assessing effect of HAART access on fertility intention and contraceptive use among HIV positive women attending health institutions in Addis Ababa, Ethiopia.

I have been informed that the **purpose** of this study is to assess perception of HIV positive women on use of barrier contraceptive methods (condom) and associated factors. Your participation in this survey will be important to improve the services provide to HIV positive women in health institutions of Addis Ababa. I understand that I am selected to participate in this study randomly from HIV positive women attending health institutions; I am also informed that eligible for this study.

I have been informed that participation in the study is entirely voluntary, I can refuse from participating fully or partially and to terminate at any time. I have been told that my answers to questions will not be given to anyone else and no reports of this study will ever identify me in any way. I have also been informed that my participation or non participation or my refusal to answer questions will have no effect on me or on the service that I can get. I am told that the question will take 45 minutes to complete the survey.

I have been informed that no monetary incentives will be given for my participation in this study. I understand that participation in this study does not involve risk. The study will help in developing appropriate fertility and prevention systems and strengthen the current HIV prevention, care and support activities, build safe pregnancy and avoid unintended pregnancy.

I understand that the results of this research will be given to me if I ask for them and **Hussen Mekonnen** is the contact person if I have questions about the study or about my rights as a study respondent. Hussen can be reached through a call at +**251 911 631634**.

Respondent's signature_____ Date _____

Thank You!

INSTRUCTIONS:

In-depth interview (IDI)

The in-depth interview will be conducted with women with HIV and health care workers involved in care and support activities in the setting as well as the care givers

Section 3.1: in-depth interview with clients:

Under this I will ask you your perception about barrier methods and factors affecting from using them among HIV positive women

Section 3.2: Focus Group Discussion with HIV Positive Women:

In this session we will have discussions on indicated agenda, during our discussion we should not indicate the name of participants and there will be codes to use as a name and all idea that will be raised along our discussion should be respected. Our discussion will be tape recorded and there will be note taker.

Section 3.3.Indepth interview with Health care providers

Under this section we will discuss issues related to fertility and condom use among clients you are providing and the discussion will be recorded with respect ion of confidentiality.

Section 3.1: in-depth interview with clients:

Under this I will ask you your perception about barrier methods and factors affecting from using them among HIV positive women

Identification:

Name of Health institution_____

Ownership_____

Facility level_____

Date of data collection _____ Time_____

Or indicate setup where the interview conducted_____

SOCIO-ECONOMIC PROFILE OF PARTICIPANTS

Age_____ number of living children_____

Occupation____ number of children intended in the future_____

Monthly income in birr_____ Start ART: 1 Yes 2: no

Educational status_____ partner tested 1. Yes 2. No 3. Unknown

Marital status_____ HIV status of partner: 1. positive, 2. Negative 3. Unknown

IN-DEPTH INTERVIEW (IDI) GUIDE

1. Tell me everything you think about what a perfect prevention/contraceptive method should be like.

   Probe!

2. Tell me your preferred contraceptive methods for you? Why?
   Probe for advantage and disadvanatage of each method and dual contraceptive method use

3. Which birth control methods have you used and stopped, and why?

   Probe!

4. What are the challenges currently you have in getting fertility services and contraceptive options?
5. Have you ever used condom
6. What factors affects you from using condom? Probe for detail information
7. How do you express your decision to have /not to have children
8. What are the influencing factors in your fertility decision?
9. Who decides fertility? Probe for husband, extended family
10. How do you understand condom as contraceptive method?
11. How HIV status affects fertility desire and contraceptive use
12. Does HAART use affect your fertility and the contraceptive use?

13. Whom do you trust in getting information regarding the fertility and contraception?
14. Do you get support from providers? Are they supportive? What was the response?
15. How do you express the information and support given by providers on fertility and contraceptive options?
16. Do you have good communication with your health care provider?
17. What do you think if two HIV positive couples did sex without condom as far as they have started ART
18. What do you suggest if two couples have different sero-status? How about concordant?
19. With whom do you want to discuss if you want to have a child? How frequent?
20. How do you understand when we say discussion with health workers about your fertility issues?
21. Do you accept that married couples should use condom as far as they are on ART and faithful to each other?
22. Do convince your sexual partner to use condom/ yourself? Why and how?
23. What do you do if your partner not willing to use condom?
24. Who is influencing you to get pregnant from your family? What about in preventing unintended pregnancy?
25. Do you feel confident in preventing unintended pregnancy? What about use of condom?

Any additional information you want to add?

Section 3.2: Focus group discussion with HIV positive women:

In this session we will have discussions on indicated agenda, during our discussion we should not indicate the name of participants and there will be codes to use as a name and all idea that will be raised along our discussion should be respected. Our discussion will be tape recorded and there will be note taker.

FOCUS GROUP DISCUSSION (FGD) GUIDE

Participants will be women who disclosed themselves, Mother support group, peer educators and others who can join the discussion)

1. What contraceptive methods have you used? What did you like/dislike about them?
2. Reason for selecting such methods.

Probe on advantage and disadvantage of each
Factors affecting on the choice of each methods

3. What birth control methods are most effective at preventing pregnancy?
4. What birth control methods are most effective in preventing infections including HIV?
5. What would an ideal contraceptive method be like?
6. What are the preferred contraceptive methods in your area?

Tell me in detail

7. Do you think women in your community would use a contraceptive method such as condom? Why or why not?
8. How do you express the communities' response if a women uses condom?
9. What are the common problems for using condom?
10. Do you want to have children
11. What is your intension to have children?
12. What about your partners intension
13. What about the intension of your family and your partners family
14. What is your view about the presence of ART in relation to fertility?
15. What about the support of health care workers?
16. Do you get support from providers? Are they supportive?
17. Have you ever asked them? What was their response?
18. How do you explain the service available in health facility and the communication of health care providers?
19. What are the common problem you faced in getting fertility and contraceptive information?

Any additional information you want to add

SECTION 3.3. Key informant INTERVIEW WITH HEALTH CARE PROVIDERS

Under this section we will discuss issues related to fertility and condom use among clients you are providing and the discussion will be recorded with respect ion of confidentiality.

CONSENT: read the consent to the interviewee

Identification

1. Name of Health institution_____
2. Ownership_____
3. Facility level_____
4. Date of data collection _____ Time_____
5. Educational level of interviewee with qualification _____
6. Year of experience of the interviewee _____

Contents of the Interviews

1. Tell me the contraceptive methods you have at hand along with ART
2. What do you feel in providing fertility and preventive messages to your clients along with provision of ART? Whose responsibility?
3. What messages do you address regarding fertility and contraception use in your facility?
4. Do you allow HIV positive women to get pregnant?
5. Have you ever discussed about fertility and contraceptive options?
6. What challenges do you face in availing fertility and contraceptive services to your clients
7. How often the clients request fertility advice? What about your feelings?
8. Have you ever encountered difficulty in addressing fertility and preventive messages to PLWH?
9. Do you have options?

    Did you get training regarding Prevention with Positives?

    How about contraceptives to prevent unintended pregnancy

10. Is there source to provide male condom for your clients? How about female condom?
11. Have you ever encountered shortage in providing contraceptive options?
12. Have you ever encountered client who was allergic to male condom?

Are there any other points that I did not cover that you want to add?

Thank you very much indeed: Time_____ date_____ year_____

ANNEX 2. 2. AMHARIC VERSION OF THE QUESTIONNAIRE

በአዲስ አበባ ዩኒቨርሲቲ
የህብረተሰብ ጤና አጠባበቅ ት/ቤት

ከኤች አይቪ ቫይረስ ጋር የሚኖሩ ሴቶች ላይ የፀረ-ኤች አይቪ መድሀኒት መኖር የመውለድ ፍላጎ q ቸው ˆና የአርግዝና መከላከያ አጠቃቀማቸው ላይ ያለውን ተጽˆኖ ለማጥናት የተዘጋጀ መጠይቅ ::

የመረጃ ና የስምምነት ቅጽ::

<u>የመረጃ ቅጽ</u>

1. መግቢያ:

ጤና ይስጥልኝ ስሜ _____ይባላል የዚህ የፀረኤች አይ ቪ መዲሃኒት መኖር ኤች አይ ቪ ቫይረስ በደማቸው በሚገኝ ሴቶች የወሊድ ፍላጎትና የቤተሰብ ምጣኔ አጠቃቀምን ለማጥናት በተዘጋጀው ጥናት ቡድን አባል ነኝ:: የጥናቱ **ዓላማ** የፀረኤች አይ ቪ መድሀኒት መኖር ከቫይረሱ ጋር በሚኖሩ ሴቶች የመውለድ ፍላጎት ላይ ያለውን ተፅእኖ ለማወቅ ነው:: የˆርስዎ በዚህ ጥናት መሣተፍ በጤና ተቋማት ውስጥ ከቫይረሱ ጋር ለሚኖሩ ሴቶች የሚደረገውን ድጋፍና ˆንክብካቤ ለማሻሻል ጠቀሜ q ው የጎላ ነው::

1. የተሳትፎ መመሪያና ሂደት/አተገባበር

ይህንን ፕሮጀክት ለመከወን ˆርሰዎ በፍቃደኝነት ˆንዲሳተፉ የተጋበዙ ሲሆን ፍቃደኛ ከሆኑ በ አማርኛ በተዘጋጀው መጠይቅ ላይ ሊመልሱልን ይችላሉ::

ሀ) የሚሰጡት መረጃ ሚስጥረዊነቱ የተጠበቀ ነው፡ ስምዎም ሆነ ሌላ መረጃ በፍፁም ለማንም †ይነገርም::

ለ) ይህንን መጠይቅ ለመሳተፍ ቢበዛ ከ45-60 ደቂቃ ይፈጃሉ፡ ሆኖም ላለመሣተፍ ከፈለጉ ጥናቱን ከጀመሩም በ|ላ ሆነ በፊት ማkረጥ መብትዎ ነው::

ሐ) መጠይቁ በ†ማረኛ ስለተዘጋጀ ውይይቱ የሚደረገው በሚያውቁት ቋንቋ ነው::

5) ከተሣትፎ የሚገኝ ጥቅም/†ደጋ

ሀ) ጥቅም፡- በዚህ ጥናት በመሳተፍዎ ከቫይረሱ ጋር ለሚኖሩ ሴቶች የጤና አገልግሎት አቅረቦት ስርአት አንዲሻሻል በማድረግ ˆራሰዎን፤ቤተሰብዎንና ህብረተሰቡን ተጠቃሚ ያደርጋል::

ለ) **አደጋ/አለመመቸት**፡-በዚህ ጥናት ላይ በመሣተፍዎ ጊዜዎን ከመሰዋትዎ ውጭ ምንም የሚያመጣው ጉዳት የለም፡፡ ነገርግን የ^ርሰዎ ተሳትፎ በወሊድ ጉዳይ ላይ ተያያዥ መረጃ ለማመንጨት ጠቃሚ ነው፡፡

ሐ) **የተሳፎ ክፍያ**፡- በዚህ ጥናት በመሳተፍዎ የሚሰጥ ምንም ዓይነት ክፍያ አይኖርም፡፡

6. ሚስጥራዊነት፡ - ከ^ርሰዎ የተገኘው መረጃ ለማንም ባለመገልፅ ሚስጢራዊነቱ ይጠበቃል፡፡ በመረጃው ስምዎ ሳይጠቀስ መለያ ቁጥር በመጠቀም በሚስጥር የሚቆለፍ ቦq ይቀመጣል፡፡

7. በጥናቱ ያለመሳተፍ ወይም የማቋረጥ መብት

በዚህ ጥናት ያለመሳተፍ መብትዎ የተጠበቀ ከመሆኑም ባሻገር ከጀመሩም በሀ|ላ ሆነ በፊት መቀጠል ካልፈለጉ በሙሉ ወይም በከፊል ማቋረጥ ይችላሉ፡፡ ይህንን በማድረግዎ በጤና አገልግሎትም ሆነ በሌላ አገልግሎት ላይ ምንም አይነት ተጽ^ኖ አይደርስበዎትም፡፡

8. የተሣqፊው መረጃ የማግኘት መብት፡- ስለዚህ ምርምር ሊጠይቁ የሚፈልጉትን መረጃ ሁሉ የማግኘት መብት †ለዎት፡ ማንኛውንም መጠየቅ የሚፈልጉትን ጥያቄ **ለተቶ ሁሴን መኮንን** በስልክ ቁጥር **0911631634** ደውለው መጠየቅ ይችላሉ፡፡

ይህ ጥናት በአዲስ አበባ ዩኒቨርሲቲ የምርምርና ስነምግባር ቦርድ qይቶ ፀድkል፡፡

<u>የጥናት ተሳትፎ ፍቃድ መጠየቅያ ቅጽ፡፡</u>

ከላይ የተገለፁትን መረጃዎች በመገንዘብ በጥናቱ ለመሣተፍ ፍቃደኛ ነዎት?

1. †ዎ ---------- ወደ ቃለመጠይቁ ይለፉ

2. መሳተፍ አልፈልግም ---------- ቃለመጠይቁን ያቁሙ

የተሳqፊ ፊርማ---------- ቀን----------

†መሠግናለሁ፡፡

የሥምምነት ቅጽ::

በዚህ የፀረኤች አይ ቪ መዲሃኒት መኖር የኤች አይ ቪ ቫይረስ በደማቸው በሚገኝ ሴቶች የወሊድ ፍላጎትና የቤተሰብ ምጣኔ አጠቃቀምን ለማጥናት በተዘጋጀው መጠይቅ ለመሣተፍ ፍቃደኝነቴን ስገልፅ የሚሉትን በትክክል በመገንዘብ ነው::

ስለጥናቱ ዓላማ በትክክል ተገንዝቤያለሁ:: ጥናቱ የፀረኤች አይ ቪ መዲሃኒት መኖር ኤች አይ ቪ ቫይረስ በደማቸው በሚገኝ ሴቶች የወሊድ ፍላጎት ለማወቅ ^ና ለዚሁ †ገልግሎት የሚደረገውን ድጋፍና ^ንክብካቤ ለማሻሻል ^ንደሚጠቅም ተገንዝቤያለሁ::

ለጥናቱም የተመረጥኩት ባጋጣሚ በሆኑን አውቄያለሁ፡ ለጥናቱም ብቁ መሆኔንም ተረድቻለሁ::

በጥናቱ መሣተፍ በኔ ፍቃዴኝነት መሆኑን †ውቄያለሁ ^ንዲሁም ጥናቱን በሙሉም ሆነ በከፊል የማቋረጥ መብት ^ንዳለኝ በትትክክል ተነግሮኛል ^ኔም አምኜበ q ለሁ:: በጥናቱ ወቅት የምሰጠው መልስ ሚስጥራዊነቱ የተጠበቀ ከመሆኑም በላይ ለማንም የማይገለፅ ^ንደሆነ ተገንዝቤያለሁ፡ በጥናቱ ውስጥ ሃሳቤ ^ንጂ ሰሜ የማይገለፅ መሆኑን ተነግሮኛል::

በጥናቱ ለመሣተፍ ሲባል ምንም †ይነት ክፍያ ^ንደማይከፈለኝ ተነገሮኛል፡ ጥናቱ በኔም ሆነ በሌሎች ላይ ምንም †ደጋ †ያመጣም፡ በጥናቱ ከ45-60 ደቂቃ ^ንደሚወሰድ ተነግሮኛል፡

የዚህን ጥናት ውጠት ብጠይቅ የማግኘት መብት ^ንዳለኝ ተነግሮኛል፡ ^ንዲሁም ስለጥናቱ ተጨማሪ መረጃ ለመጠየቅ ከፈለኩ †ቶ ሁሴን መኮንንን በስልክ ቁጥር 0911631634 ማነጋገር ^ንደምችል ተነገሮኛል:: ከላይ የተገለጹትን ሀሳቦች በሙሉ ተረድቻለሁ፤ ለዚህም በሚከተለው ፊርማዬ †ረጋግጣለሁ::

የተሳ q ፊው ፊርማ፡ ----------ቀን፡ ----------

†መሰግናለሁ

በዚህ መጠይቅ ስምንት ዋና ዋና ክፍሎች ሲኖሩት ክፍሎችም ከመመሪያቸው ጋር ^ንደሚከተለው ቀርበዋል።

ክፍል 1.1.ማህበራዊ ና ኢኮኖሚያዊ ሁኔq።

በሚከተለሁት ጥያቄዎች፡ ሰለርሰዎና ስለቤተሰብዎ ሁኔq ^ጠይቀዎተለሁ

ክፍል 1.2 የኤች አይ ቪ ሁኔq።

በዚህ መጠይቅ ሰለርሰዎና የትዳር/የያq አጋርዎ የኤች አይ ቪ ሁኔq ^ጠይቀዎq ለሁ

ክፍል 1.3፡ ስለ ፀረኤች አይ ቪ መድሃኒቶች ሁኔqን ለማዎቅ

ስለ ፀረኤች አይ ቪ መድሃኒቶ ሁኔq፡ ^ጠይቀዎq ሁ

ክፍል 1፡4፡ ሰለ ልጅ መውለድ ፍላጎት፡

በዚህ ር^ስ ስር ተጨማሪ ልጅ የመውለድ ፍላጎተrዎን ^ጠይቀዎq ለሁ፡።

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ክፍል 1.5፡ የ^ርግዝና ውሳኔ፡

በዚህ ስለ^ርግዝና ውሳኔና ስለ ግብረሥጋ ግንኙነት ሁኔqዎ ^ጠይቀዎq ለሁ፡ በጥያቄው የማይመችዎት ካለ ማለፍ ይችላሉ ሆኖም ሁሉም መልሶቸች ጠቃሚ ናቸው፡

ክፍል 1.6፡የ^ርግዝና መከላከያ ዘዴዎች፡

ስለ ^ርግዝና መከላከያ ዘዴና ምርጫዎ ^ጠይቀዎq ለሁ።

ክፍል 1.7፡ የግብረ ስጋ ግንኙነት ሁኔq መረጃ።

በዚህ መጠይቅ ስለራስዎና የያq አጋርዎ፡ የግብረሥጋ ግንኙነት qሪክ ^ጠይቆq ለሁ፡ በምጠይቅዎት ጥያቄ የማይስማማዎት ካለ ወደሚቀጥለው ማለፍ ይችላሉ፡ ሆኖም ^ርስዎ በቅንነት የሚሰጡት መልስ በጣም አስፈላጊ ነው።

ክፍል 1፡8፡ የበሽተኛውን ማህደር በመገምገም መረጃ መውሰጃ ቅጽ።

በሚከተሉት መጠይቆች መሠረት በግለሰቡ ማህደር መረጃ ውሰድ/ጂ፡ ለሚከተሉት መጠይቆች የበሽተኛውን ካርድ ብቻ መመልከት ይበቃል።

የመጠይቁ ˆና የቦq ው መለያ

01 የመጠየቁ መለያ ቁጥር _____
02. የጠያቂው ስም _____ፊርማ _____ ቀን _____ ወር __ዓ.ም_____
2. መጠይቁን ያረጋገጠው ሰው ስም_____ ፊርማ _____ቀን ____ወር __ዓ.ም
3. የጤና ተቋሙ መለያ፡
3.1. የጤና ተቋሙ ስም _____
3.2. ክልል _____ ክ/ከ _____ ወረዳ _____ ቀበሌ_____
3.3. **የጤና ተቋሙ ባለቤት፡ 3.1.መንግስት _____** 3.2 **ግለሰብ _____**
3.3 መንግስተዊ ያልሆኑ ድርጅቶች _____3.4.**ሌላ ይጥቀሱ _____**
4. **የኤ አር ቲ መለያ ቁጥር፡----------** **5. የበሽተኛው ከርድ ቁጥር፡----------**

1.1. የተሣqፊው ማህበራዊ ˆና ኢኮኖሚያዊ ኑሮ ሁኔq መረጃ፡ አዲስ አበባ፡ 2004.

ተ.ቁ	መጠይቅ	መልስና መለያ	ወደ--ˆሰፍ
101	**ዕድሜዎ ስንት ነው?**	_____ዓመት(በሙሉ ዓመት ይጠቀስ	
102	**ብሔርዎ ምንድነው?**	**አማራ ----------1** **ኦሮሞ ----------2** **ጉራጌ ----------3** **ትግሬ ----------4** **ሲሊጤ----------5** **ጋሞ----------6** **ሌላ ከሆነ ይጠቀስ--------89**	
103	**ሐይማኖትዎ ምንድነው?**	**ኦርቶዶክስ----------1** **ሙስሊም ----------2** **ፕሮቲስ q ንት----------3** **ካቶሊክ----------4** **ሌላ ከሆነ ይገለጽ-----**89	

104	**ተምረው ያጠናቀቁት ከፍተኛው የት/ት ደረጃ**	**_____ክፍል ያጠናቀቁ** **ማንበብና መጻፍ የማይችል------1** **ማንበብና መጻፍ የሚችል--------2** **ከ 1-8ኛ ክፍል ያጠናቀቁ ---------3** **ከ 9-12ኛ ክፍል ያጠናቀቁ---------4** **ከ 12ኛ በላይ----------5**	

1.1. የተሣqፊው ማህበራዊ ˆና ኢኮኖሚያዊ ኑሮ ሁኔq መረጃ፡ አዲስ አበባ፡ 2004.

ተ.ቁ	**መጠይቅ**	**መልስና መለያ መስጫ**	**ˆለፍ**
105	**ጠቅላላ የወር ገቢ ስንት ነው ? (በብር)**	**_____ ኢት. ብር** **ገቢ የለኝም ----------1** **ከብር 500 በqች ---------2** **ከ500 - 1000 ----------3** **ከ1001 - 3000 ----------4** **ከ3000 በላይ ----------5** **ሌላ ካለ ይገለጽ----------89**	
106	**በአሁኑ ወቅት ያለበት የሥራ ዓይነት ምንድነው?**	**ስራ የለኝም ----------1** **ተማሪ ----------2** **የቤት ˆመቤት ----------3** **የቤት ሠራተኛ ----------4** **የቀን ሠራተኛ ----------5**	

		ነጋዴ ----------6 የቡና ቤት ሠራተኛ ---------7 የመንግሥት ሠራተኛ -------8 የግል ሠራተኛ ----------9 ሌላ ካለ ይገለጽ----------89	
107	በአሁኑ ወቅት የጋብቻ ሁኔq ˆንዴት ነው ?	ያላገቡ ----------1 ያገቡ ----------2 ባል የሞተባቸው ----------3 የተፋቱ ----------4------ ያልተጋበ ጥንዶች/የያq ጓደኛ ያላቸው---5	110
108	ያገቡ ከሆነ መጀመሪያ ሲያገቡ አድሜዎ ስንት ነበር?	----------	
109	ባለቤትዎ ሌላ ሚስት አላቸው ወይስ ˆርስዎ ብቻ ነዎት?	አኔ ብቻ ነኝ ----------1 ሌላ ሚስት አለው ---------2	
110	የተፋቱ&የተለያዩ ወይም በሞት ከተለዩ መጀመሪያ ሲጋቡ ˆድሜዎ ስንት ነበር?	_____ዓመት----------1 አላውቅም ----------2 ፈቃደኛ አይደለሁም---------- 3	
111	ባለቤትዎ በሞት ከተለዩ፡ መቼ ነው የሞቱት	ቀን _____ወር_____ዓመት_____	
112	የሞቱበት ምክንያት ምንድን ነው?	----------	

ክፍል 1.2 የኤች አይ ቪ ሁኔq ፡ የተመለከተ መረጃ፡፡

በዚህ መጠይቅ ስለራስዎና የትዳር/የያq አጋርዎ የኤች አይ ቪ ሁኔq ˆጠይቀዎq ለሁ፡

ተ.ቁ	መጠይቅ	መልስና መለያ	ˆለፍ
201	የኤች አይ. ቪ. ቫይረስ ˆንዳለብዎ ተመርምረው ካወቁ ምን ያህል ጊዜ ሆንዎት?	..... ወር ..... አመት ------1 አላስ q ውስም ----------2 መልስ የለም ---------- 99 ሌላ ካለ ይገለጽ ---------- 89	
202	ኤች አይቪ የተመረመሩት ለምን ነበር?	ለˆርግዝና ምርመራ ----------1 በጤና ሞያተኞች ምክር ምክንያት --2 የኤድስ ምልክቶች q ይተውና q ምሜ -3 ባለቤቱ q ሞ (የኤድስ ምልክት q ይቶበት -----4 የትዳር ጓደኛዬ ˆንድመረመር ጠይቆኝ- 5 የኤች አይቪ ሁኔ q ዬን ለማየት -----6 የያ q ጓደኛዬ ተጋላጭነት መኖር---7 ደም ለመለገስ ----------8 ኤች አይቪ በደሙ ውስጥ ከሚገኝ ሰው ጋር ግንኙነት በማድረጌ -----9 አላውቅም ----------99 ሌላ ካለ ይገለጽ _____ 89	
203	አሁን የትዳር/የያ q አጋር አለዎት?	አለኝ ----------1 የለኝም ----------2 --------→	207
204	የተቃራኒ ያ q አጋርዎ/ባለቤትዎ ተመርምረዋል?	አዎን ----------1 አልተመረመሩም------2----------→ አላውቅም----------3	207

205	**ከተመረመሩ የምርመራ ውጤቱ ምን ነበር?**	**ፖዘቲቭ (ከቫይረሱ ጋር ይኖራል)----1** **ከቫይረሱ ነፃ ነው ----------2** **አላውቅም ----------3**	
206	**የምርመራ ውጤትዎን** **ለተቃራኒ ፆq አጋርዎ ገልፀዋል?**	**አዎን----------1** **አልተናገርኩም ----------2**	
207	**ምን ያህል ልጆች ወልደዋል?**	**በህይወት የተወለዱ ልጆች ቁጥር____** **ምንም ልጅ አልወለድኩም ----------1** **ምንም በህይወት ያለ ልጅ አልወለድኩም-----2** **ሌላ ካለ ይግለጹ ----------89**	
208	**በአሁኑ ጊዜ ምን ያህል** **ልጆች በህይወት አሉዎት?**	**በህይወት ያሉ ልጆች ቁጥር _____** **ምንም በህይወት ያለ ልጅ የለኝም----1** **መልስ የለም ----------99** **ሌላ ካለ ይገለጽ ----------89**	**209**
209	**በኤች አይ ቪ ምክንያት የሞተ ልጅ አለዎት?**	**አዎ ----------1** **የለኝም ----------2** **አይ q ወቅም----------97**	
210	**ልጆችዎን አሰመርምረዋል?**	**አዎን --1 አላስመረመርኩም---- 2**	

<u>የኤች አይ ቪ ሁኔqዎን (የደም ምርመራ ውጤትዎን) ለሌሎች መናገር</u>

መመሪያ: ምርመራ ውጤት ለሌሎች መናገር የተለያየ መልስ ሊኖር ይችላል በዚህ መጠይቅ ˆርሰዎ የደም ውጤትዎን ሲነግ[ቸው የነበራቸው መልስ ምን ˆንደነበረ ˆጠይቀዎተለሀ::

211. የደም ምርመራ ውጤትዎን ለሌሎች ነግረዋል? አዎን-----*1* አልተናገርኩም-----*2* መልሱ አልተናገርኩም ከሆነ ወደ ክፍል *1.3* ዕለፍ/ፊ

212. የምርመራ ውጤትዎን ለሌሎች ሲነግሩ የተነገራቸው ሰዎች ምላሽ ምን ነበር?

ተቁ	ጥያቄ	አበረqች ነበር	አበረqች አይደለም	ለውጥ የለም
1.	የትዳር አጋርዎ/ባለቤትዎ			
2.	የያq አጋርዎ			
3.	አናትዎ			
4.	አባትዎ			
5.	አህትዎ			
6.	ወንድምዎ			
7.	አክስትዎ/አጎትዎ/			
8.	ጓደኛዎ			
9.	ልጅዎ			
10.	ጎረቤትዎ			
11.	ሌላ ካለ ይገለጽ			

ክፍል 1.3፡ ፀረ ኤች አይቪ መድሃኒትን የተመለከተ መረጃ፡፡

ስለ ራስዎና የያq አጋርዎ የፀረኤች አይ ቪ መድሃኒቶች ሁኔqን፡ ˆጠይቀዎተሁ፡፡

ተ.ቁ	መጠይቅ	መልስና መለያ ቁጥር	ˆለፍ
301	በአሁኑ ወቅት ፀረ ኤች አይቪ መድሀኒት መጠቀም ጀምረዋል?	አዎን ----------1 አልጀመርኩም----------2------→	303
302	መድሃኒቱን ከጀመሩ ምን ያህል ጊዜ ሆነዎት?	ከ ..... ወራት/ ..... አመት በፊት አላስqውስም ..... 1 ˆርግጠኛ አይደለሁም ---2 ሌላ ካለ ይገለጽ 89	
303	የሚወስዳቸውን የፀረ ኤች አይቪ መድሃኒቶ በስም ያውkቸዋል?	አዎን ----------1 አላውቅም----------2---------- ˆርግጠኛ አይደለሁም-----3	305
304	ምን አይነት ፀረ ኤች አይ ቪ መድሀኒት ያውቃሉ? በስም ˆንዲጠሩ ና ዝርዝሩን ዓፍ/ፊ	----------	
305	የቅርብ ጊዜ ሲዲ ፎር ውጤትዎ ስንት ነው?	..... በቁጥር ይገለጽ አላውቅም ..... 1 ˆርግጠኛ አይደለሁም--------2 ሌላ ካለ ይገለጽ 89	
306	በአርስዎ አመለካከት/ ምዘና የፀረ ኤች. አይ. ቪ ኤድስ መድሃኒት መጠቀም ከጀመሩ ጀምሮ በአጠቃላይ የጤናዎ ሁኔq ˆንዴት ነው	በጣም ተሻሽሎዋል .....1 ምንም ለውጥ የለውም..... 2 ˆየተባባሰ ነው .....3 ጣም ተባብሷል .....4 ሌላ ካለ ይገለጽ 89	

307	**በˆርስዎ አመለካከት/ምዘና አሁን ያለዎትን የጤንነት ሁኔq ከዓመት በፊት ከነበሩበት ሁኔq ሲያወዳድሩት ˆንዴት ይገልጹq ል?**	**በጣም ከፍቷል---------*1*** **ከፍቷል----*2*** **ተመሳሳይ ነው -------*3*** **ተሻሽሏል----------*4*** **በጣም ተሻሽሏል ------*5***	

ክፍል 1.4፡ የአርግዝና ˆና ልጅ መውለድ ፍላጎት የተመለከተ መረጃ፡፡

በዚህ ስር የˆርሰዎንና የያq አጋርዎን የግብረሥጋ ግንኙነት ሁኔqና ተጨማሪ ልጅ የመውለድ ፍላጎትዎን ˆጠይቀዎq ለሁ፡፡

401	**በአሁኑ ወቅት የግብረስጋ ግንኙነት ሁኔqዎ አንዴት ነው?**	**ግንኙነት አደርጋለሁ ----*1*** **ግንኙነት አላደርግም-------*2***	
402	**ከአሁኑ የትዳር አጋሮ ጋር ለምንያህል ጊዜ አብረው ኖረዋል?**	***ፖዘቲቭ ከመሆኔ በፊት ---1*** ***ፖዘቲቭ ከሆንኩ በ|ላ-------2***	
403	**በአሁኑ ወቅት ነብሰጡር ነዎት/ጸንሰዋል?**	**አዎን .....*1*** **አይደለም ..... *2*** **አላውቅም ..... *3*** **ሌላ ካለ ይገለጽ *89***	
404	**ተጨማሪ ልጅ መውለድ ይፈልጋሉ?**	**አዎን----------*1*** **አልፈልግም----------*2***	***409***
405	**ተጨማሪ ልጅ መውለድ ከፈለጉ** **መቼ ነው መውለድ የሚፈልጉት?**	**ከ____ወራት/ወይም___ዓመት በኋላ-*1*** **አላውቅም----------*2*** **ሌላ ካለ ይገለጽ----------*3***	
406	**ስንት ልጆች ˆንዲኖርዎት ይፈልጋሉ?**	**_____የልጆች ቁጥር--------*1*** **አላውቅም----------*2*** **መልስ የለም----------*99***	

407	**ለወደፊቱ ምን ያህል ልጆች ˆንዲኖርዎት ይፈልጋሉ?**	**---------- ልጆች**	
408	**መልሱ አዎን ከሆነ ለምን ብዙ ልጆች አንዲኖረዎት ፈለጉ?**	**ከቫይረሱ መክላከያ መድሀኒት ሰላለ ------1** **የጤንነቱ ሁኔq በመሻሻሉ --2** **አዲስ ስላገባሁ -------3** **ባለቤቱስለፈለገ -----4** **በጤና ሞያተኞች ምክር----5** **ሌላ ካለ ይግለጹ--------89**	
409	**መልሱ አልፈልግም ከሆነ ለምን ተጨማሪ ልጅ መውለድ አይፈልጉም?**	**የምፈልገውን ያህል ልጅ ስላለኝ-1** **ቫይረሱ ከናት ወደልጅ መተላለፉን ፈርቼ-------2** **ያለኝ የገቢ ምንጭ ተጨማሪ ልጅ ለማሣደግ ስለማይበቃኝ--3** **በጤና ሞያተኞች ምክር----4** **መውለድ ጤናዬን ይጎዳል ብዬ ስለምፈራ--------5** **ሌላ ካለ ይግለጹ---------89**	
410	**የትዳር/የተቃራኒ ፆq አጋረዎ ልጅ ˆንዲኖርዎት ይፈልጋል?**	**አዎን ----------1** **አይፈልግም---------2** **አላውቅም ----------3** **የትዳር ጓደኛ የለኝም----4** **ሌላ ካለ ይገልጽ----------89**	

ክፍል 1.5፡ ˆርግዝናን ስለመወሰን፡፡

በዚህ ስለˆርግዝና ውሳኔና ስለ ግብረሥጋ ግንኙነት ሁኔqም ˆጠይቀምqለሁ፡ በጥያቄው የማይመችዎት ካለ ማለፍ ይችላሉ ሆኖም ሁሉም መልሶች ጠቃሚ ናቸው፡

ተ.ቁ	መጠይቅ	መልስና መለያ	ˆለፍ
501	መቼ መጸነስ ይፈልጋሉ?	----------	
502	መቼ መጸነስ ˆንዳለብዎት ወሣኙ ማን ነው?	አኔው ራሴ-----1 ባለቤቴ ነው ----2 ሁለqችንም ነን ---3 ሌላ ካለ ይገለጽ --89	
503	ስለ ወሊድና ˆርግዝና መከላከያ ከባለቤትዎ ጋር ተወያይተው ያውቃሉ?	አዎን-----1 አልተወያየሁም-----2 ሌላ ካለ ይገለጽ---89	
504	ስለ ወሊድና ˆርግዝና መከላከያ ከጤና ሞያተኞች ጋር ተወያይተው ያውቃሉ?	አወን ----1 አላውቅም ---2	
505	የቤተሰቦቻችሁ ተጽዕኖ ምን ያህል ነው?	ሁል ጊዜ ----------1 አልፎ አልፎ -------2 በፍጹም የለም -----3	
506	ስለ ወሊድና ˆርግዝና መከላከያ የምክር አገልግሎት አግኝተው ያውቃሉ?	አዎን ---1 በፍጹም-----2 አልፎ አልፎ------3	
507	የምክር አገልግሎት ካገኙ ከየት ነው?	ከጤና ሞያተኞች--------1. ከመገናኛ ብዙሃን---------2 ከጓደኛ----------3 ሌላ ካለ ይገለጽ---------89	
508	የጤና ባለሙያዎች ኤች አይ ቪ ቫይረስ ስላለብዎት ˆንዳይወልዱ ተጽዕኖ አድርገውበወት ያውቃሉ?	አዎ -----1. አያውቁም ---------2	

ክፍል 1.6፡ የˆርግዝና መከላከያ ዘዴዎች፡ አጠቃቀምና ምርጫ፡፡

በዚህ መጠይቅ ስለ ˆርግዝና መከላከያ ዘዴና ምርጫዎን ˆጠይቀዎ q ለሁ፡፡

ክፍል 1.6፡የˆረግዝና መቆጣጠሪያ (የመከላከያ) አጠቃቀም መረጃ፡፡ አዲስ አበባ፡ ኢትዮጵያ፡2004

ተቀ	መጠይቅ	መልስና መለያ	ˆለፍ
601	ባለፉተ 6 ወራት ግንኙነት አድርገው ነበር?	አዎን --------1 አላደረኩም-----2	
602	ቋሚ ˆርግዝና መከላከያ አድርገዋል? (ለምሳሌ ቀዶጥገና)	አዎን ----------1 አላደረኩም----------2	
603	ላለፉት 6 ወራት ˆርግዝናን ለመከላከል ሲባል መከላከያ ተጠቅዋል? (ኮንዶምን ጨምሮ)	አዎን----------1 አልተጠቀምኩም----------2	605
604	ምን አይነት የመከላከያ ዘዴ ነበር የተጠቀሙት? (የማህፀን ማስቋጠር ወይም ማህፀን የወጣ ከሆነ ወሩንና ዓመቱን ፃፍ/ፊ)_____	የሚዋጥ ኪኒን(ዕንክብል)-------1 በመርፌ የሚሰጥ----------2 በማህፀን በር የሚቀመጥ(ሉፕ)---3 በማህፀን አፍ የሚቀመጥ (ዲያፍራም)----------4 የወንድ ኮንደም----------5 የሴት ኮንደም----------6 በክንድ የሚቀበር----------7 የሴት ማህፀን ማውጣት--------8--- የሴት ማህፀን ማስቋጠር--------9--- የወንድ ዘር ፍሬ ማስቋጠር----10-- የወር አበባ ቀን አቆጣጠር ዘዴ በመጠቀም ----------11 ጡት በማጥባት---------12	ጊዜውን ፃፍ/ፊ

		ሌላ ካለ ይጥቀሰ---------89	
605	ባለፉት 6 ወራት ግንኙነት ሲያደርጉ ኮንዶም ለምን ያህል ጊዜ ተጠቅመዋል? (አንዱን ምርጫ ብቻ ይጥቀሱ)	አንደውም አልተጠቀምኩም----1 አልፎ አልፎ ----------2 በአብዛኛው ተጠቅሜአለሁኝ-----3 ሁል ጊዜ ˆጠቀማለሁኝ ---------4 ለመመለስ ፍቃደኛ አይደለሁም--5	
606	ˆርሰዎ የሚጠቀሙትን የˆርግዝና መቆጣጠሪያ (መከላከያ) ዘዴን የመረጡበት ምክንያት ምንድነው?	ለአጠቃቀም ቀላል ነው ------1 ለአጠቃቀም ምቹነው ----------2 ግንኙነት ላይ ተፅዕኖ የለውም --3 የአባላዘር በሽተኞችን ስለሚከለክል፣ ኤች አይ ቪንም ጭምር ---------4 ˆርግዝናን ስለሚከላከል-----5 ባለቤቴ መጠቀሜን ስለማይፈልግ --6 ˆርካሽ ስለሆነ ----------7 ተጓዳኝ (የጎንዮሽ ችግር) ስለሌለው-8 በጤና ሞያተኞች ምክር ---9 ጓደኛዬ ስለምትጠቀመው ---------10 ባለቤቴ መቆጣጠሪያ ስለሚጠቀም-11 ሌላ ካለ ይጠቀስ _____89	

ተቀ.	መጠይቅ	መልስና መለያ	ˆለፍ
607	የˆርግዝና መቆጣጠሪያ ዘዴ የማይጠቀሙበት ምክንያት?	ነብሰጡር ስለሆንኩ -----1 ለማርገዝ ስልምፈልግ ----2 ለማስወረድ ስለምችል -----3 አረግዛለሁ ብዬ ስለማላስብ--4 ባረግዝም ግድ የለኝም -------5 መከላከያ በመጠቀም ስለማላምን--6 ምክንያቱን አላውቅም ----7 ማርገዝ ስለማልችል(ማዛን ስለሆንኩ)----------8 ባለቤቱ አይፈቅድልኝም ----9 የሚጠባ ልጅ ስላለኝ ---10 አች አይ ቪ ስላለብኝ----11 ሌላ የጤና ችግር ስላለብኝ (ምሳሌ፡ ክብደት መጨመር የወር አበባ መዛባት ወዘተ) --12 ሌላ ካለ ይገለፅ _____89	

<u>ክፍል 1.7፡ የግብረስጋ ግንኙነት ሁኔq መረጃ፡፡</u>

በዚህ መጠይቅ ስለˆራስዎና የያq አጋርዎ የግብረሥጋ ግንኙነት qሪክ ˆጠይቀወq ለሁ፡፡ በምጠይቀዎት ጥያቄ የማይስማማዎት ካለ ወደሚቀጥለው ማለፍ ይችላሉ፡ ሆኖም ሁሉም ጠቃሚ ናቸው፡ˆርሰዎ በቅንነት የሚሰጡት መልስ በጣም አስፈላጊ ነው፡፡

701. በህይወትዎ ከስንት ወንዶች ጋር የግብረስጋ ግንኙነት ፈጽመዋል ?

1. ከ _____ ወንዶች ጋር፡
2. ምንም አላደረኩም፡ መልሱ ምንም ከሆነ ወደ ጥያቄ ቁጥር 702 ዕለፍ/ፊ
3. አላውቅም

702. ባለፉት 6 ወራት ከስንት ወንዶች ጋር የግብረሥጋ ግንኙነት አድርገዋል?

1. _____# ወንዶች ጋር፡ ከዚህ በ q ችያለውን ሠንጠረዥ ሙላ/ይ

2. ምንም አላደረኩም፡ መልሱ ምንም ከሆነ ወደ ጥያቄ ቁጥር 703 ˆ ለፍ/ፊ

3. አላውቅም

703. ለምን ግንኙነት አላደረጉም_____መልሱን ከገለፀ በኋላ ወደ ጥያቄ ቁጥር 7 ˆ ለፍ/ፊ

704. የሚከተሉት ጥያቄዎች ባለፉት 6 ወራት ግንኙነት ላደረጉ ሴቶች ብቻ ይመለከተል::

ተ.ቁ	መጠይቆች	ክፍል 1	ክፍል 2	ክፍል 3	ክፍል 4
1	ያለዎት ግንኙነት ˆንዴት ነው	☐	☐	☐	☐
2	ላለፉት 30 ቀናት ለምን ያህል ጊዜ የግብረ ሥጋ ግንኙነት አድርገዋል?	ለ----- ጊዜ አላውቅም	ለ----- ጊዜ አላውቅም	ለ----- ጊዜ አላውቅም	ለ----- ጊዜ አላውቅም
3	ላለፉት 30 ቀናት በግንኙነት ጊዜ ኮንዶም ለምን ያህል ጊዜ ተጠቅመዋል	ለ----- ጊዜ አይ q ወቅም	ለ----- ጊዜ አይ q ወቅም	ለ----- ጊዜ አይ q ወቅም	ለ----- ጊዜ አይ q ወቅም
4	የያ q አጋርዎን ኤች አይቪ ሁኔ q ያውቃሉ	1.አውቃ→ 5 2.አላውቅም(6)	1.አውን →5 2.አላውቅም(6	1.አውቃ→5 2.አላውቅም(6	1.አውቃ→5 2.አላውቅም(6
5	የያ q አጋርዎ ኤችአይቪ ምርመራ ውጤት ምንድን ነው?	1.ፖዘቲቭ(6) 2.ነጌቲቭ(7)	1.ፖዘቲቭ(6 2.ነጌቲቭ(7)	1.ፖዘቲቭ(6 2.ነጌቲቭ(7)	1.ፖዘቲቭ(6 2.ነጌቲቭ(7)
6	ባለቤትዎ ፀረኤች አይ ቪ መድሀኒት ይወስዳሉ?	1.አዎ 2.አይወስድም 3.አላውቅም	1.አዎ 2.አይወስድም 3.አላውቅም	1.አዎ 2.አይወስድም 3.አላውቅም	1.አዎ 2.አይወስድም 3.አላውቅም
7	ባለቤትዎ የርስዎን ኤች አይቪ ሁኔ q ያውቃሉ?	1. አውን 2.አያውቅም	1. አውን 2.አያውቅም	1. አውን 2.አያውቅም	1. አውን 2.አያውቅም
መለያ፡1. የትዳር ጓደኛ 2. ቋሚ የያ q አጋር 3. ድንገተኛ የያ q አጋር 4. በአጋጣሚ የተደረገ 5. ሌላ ካለ ይገለጽ ____ ˆ ነዚህን ቁጥሮች በመጀመሪያው ሳጥን ውስጥ ሙላ/ይ::					

በመጠይቁ በመሳተፍዎ በጣም አመሰግናሁ

መጠይቁ ያለቀበት ሰዓት_____ ደቂቃ _____ ቀን---------- ዓ.ም----------

ክፍል 1፡8፡ የበሽተኛውን ማህደር በመገምገም መረጃ መውሰጃ ቅጽ፡፡

በሚከተሉት መጠይቆች መሠረት በግለሰቡ ማህደር መረጃ ውሰድ/ጂ፡ ለሚከተሉት መጠይቆች የበሽተኛውን ማህደር ብቻ መመልከት ይበቃል፡፡

1. **ማህደሩ የተያበት ቀን _____ ወር_____ ዓ.ም_____**
2. **የጠያቂው ስም _____ፊርማ_____**
3. **የጤና ተቋሙ ሥም _____**
4. **ለመጀመሪያ ጊዜ ኤች አይ ቪ የተገኘበት1.ቀን_____ ወር _____ዓ.ም_____**
   2. አልተገኘም _____

5. የቅርብ ጊዜ ሲዲ ፎር ውጤት 1. _____2. አልተገኘም ⟶ 6 ቁጥር ˆለፍ/ፊ

5.1 ናሙና የተወሰደበት ቀን _____ ወር _____ዓ.ም

6. ዝቅተኛ የሲዲ ፎር ቁጥር 1._____2. የለም---------- ወደ 7 ቁጥር

6.1 ናሙና የተወሰደበት ቀን _____ ወር _____ ዓ.ም _____

7. የዓለም ጤና ድርጅት ኤች አይ ቪ ደረጃዎች፡

1. ደረጃ፡1 2. ደረጃ፡2 3. ደረጃ፡3 4. ደረጃ፡4

5 በቂ መረጃ የለም (ምክንያቱን ጻፍ/ፊ) _____

ANNEX: 3.2.2. AMHARIC VERSION OF THE INFORMATION FORM:
መጠይቅ ክፍል 2፡ የክትትል መረጃ መሰብሰቢያ፤

<u>የመረጃ ቅጽ</u>

1. መግቢያ፡

ጤና ይስጥልኝ ስሜ _____ይባላል የዚህ የፀረኤች አይ ቪ መዲሃኒት መኖር ኤች አይ ቪ ቫይረስ በደማቸው በሚገኝ ሴቶች የወሊድ ፍላጎትና የቤተሰብ ምጣኔ አጠቃቀምን ለማጥናት በተዘጋጀው ጥናት ቡድን አባል ነኝ፡፡ የጥናቱ ዓላማ የፀረ ኤችአይቪ መድሃኒቶች ከተጀመሩ በ|ላ በልጅ ፍላጎት ላይ ያላቸውን ተፅዕኖ ለማወቅ ነው፡፡ የ^ርስዎ በዚህ ጥናት መሣተፍ በጤና ተቋማት ውስጥ ከቫይረሱ ጋር ለሚኖሩ ሴቶች የሚደረገውን ድጋፍና ^ንክብካቤ ለማሻሻል ጠቀሜq ው የጎላ ነው፡፡

2. የተሳትፎ መመረያና ሂደት/አተገባበር

ይህ ጥናት ከዛሬ ጋር በቀጠሮ በሚመጡበት ወቅት ለሁለት ተከq qይ ጊዜያት የሚደረግ ነው፡፡ ይህንን ፕሮጀክት ለመከወን ^ርሰዎ በፍቃደኝነት አንዲሳተፉ የተጋበዙ ሲሆን ፍቃደኛ ከሆኑ በ አማርኛ በተዘጋጀው መጠይቅ ላይ ሊመልሱልን ይችላሉ፡፡

ሀ) የሚሰጡት መረጃ ሚስጥረዊነቱ የተጠበቀ ነው፡ ሰመዎም ሆነ ሌላ መረጃ በፍፁም ለማንም †ይገለጽም፡፡

ለ) ይህንን መጠይቅ ለመሳተፍ ቢበዛ 30 ደቂቃ ይፈጃሉ፡ ሆኖም ላለመሣተፍ ከፈለጉ ጥናቱን ከጀመሩ በ|ላም ሆነ በፊት ማkረጥ መብትዎ ነው፡፡

ሐ) መጠይቁ በ†ማረኛ ስለተዘጋጀ ውይይቱ የሚደረገው በሚያውቁት ቋንቋ ነው፡፡

3) ከተሣተፎ የሚገኝ ጥቅም/†ደጋ

ሀ) ጥቅም፡ - በዚህ ጥናት በመሳተፍዎ ከቫይረሱ ጋር ለሚኖሩ ሴቶች የጤና አገልግሎት አቅረቦት ስርአት ^ንዲሻሻል በማድረግ ^ራሰዎን፤ቤተሰብዎንና ህብረተሰቡን ተጠቃሚ ያደርጋል፡፡

ለ) አደጋ/አለመመቸት፡-በዚህ ጥናት ላይ በመሣተፍዎ ጊዜዎን ከመሰዋትዎ ውጭ ምንም የሚያመጣው ጉዳት የለም፡፡ ነገርግን የ^ርሰዎ ተሳትፎ በወሊድ ጉዳይ ላይ ተያያዥ መረጃ ለማመንጨት ጠቃሚ ነው፡፡

ሐ) የተሳፎ ክፍያ፡- በዚህ ጥናት በመሳተፍዎ የሚሰጥ ምንም ዓይነት ክፍያ አይኖርም፡፡

4. ሚስጥራዊነት፡ - ከ^ርሰዎ የተገኘው መረጃ ለማንም ባለመገልፅ ሚስጢራዊነቱ ይጠበቃል፡፡ በመረጃው ስምዎ ሳይጠቀስ መለያ ቁጥር በመጠቀም በሚስጥር የሚቆለፍ ቦq ይቀመጣል፡፡

5. በጥናቱ ያለመሳተፍ ወይም የማቋረጥ መብት

በዚህ ጥናት ያለመሳተፍ መብትዎ የተጠበቀ ከመሆኑም ባሻገር ከጀመሩ በሀ|ላም ሆነ በፊት መቀጠል ካልፈለጉ በሙሉ ወይም በከፊል ማቋረጥ ይችላሉ፡፡ ይህንን በማድረግዎ በጤና አገልግሎትም ሆነ በሌላ አገልግሎት ላይ ምንም አይነት ተጽ^ኖ አይደርስበዎትም፡፡

6. የተሣqፊ መብት፡- ስለዚህ ምርምር ሊጠይቁ የሚፈልጉትን መረጃ ሁሉ የማግኘት መብት †ለዎት፡ ማንኛውንም መጠየቅ የሚፈልጉትን ጥያቄ ለአቶ ሁሴን መኮንን በስልክ ቁጥር 0911631634 ደውለው መጠየቅ ይችላሉ፡፡

ይህ ጥናት በአዲስ አበባ ዩኒቨርሲቲ የምርምርና ስነምግባር ቦርድ qይቶ ፀድkል፡፡

7. የጥናት ተሳትፎ ፍቃድ መጠየቅያ ቅጽ

ከላይ የተገለፁትን መረጃዎች በመገንዘብ በጥናቱ ለመሣተፍ ፍቃደኛ ነዎት?

1. †ዎ ---------- †መስማነው ቃለመጠይቁን ይቀጥሉ፡፡
2. ለመሳተፍ አልፈልግም ---------- †መስማነው ቃለመጠይቁን ያቁሙ፡፡

የተሳqፊ ፊርማ---------- ቀን----------

†መሠግናለሁ፡፡

የፀረ ኤችአይቪ መድሃኒቶች ከተጀመሩ በ|ላ በልጅ ፍላጎት ላይ የሚየስከትለውን ተፅዕኖ ለማዎቅ የተዘጋጀ ቅጽ።

የሥምምነት ቅጽ።

በዚህ የፀረ ኤች አይ ቪ መዲሃኒት መኖር ኤች አይ ቪ ቫይረስ በደማቸው በሚገኝ ሴቶች የወሊድ ፍላጎትና የቤተሰብ ምጣኔ አጠቃቀምን ለማጥናት በተዘጋጀው መጠይቅ ለመሣተፍ ፍቃደኝነቱን ስገልፅ የሚከተሉትን በትክክል በመገንዘብ ነው።

ስለጥናቱ ዓላማ በትክክል ተገንዝቤያለሁ። ጥናቱ የፀረኤች አይ ቪ መዲሃኒት መኖር ኤች አይ ቪ ቫይረስ በደማቸው በሚገኝ ሴቶች የወሊድ ፍላጎትና የቤተሰብ ምጣኔ አጠቃቀምን ለማወቅ ^ና ለዚሁ †ገልግሎት የሚደረገውን ድጋፍና ^ንክብካቤ ለማሻሻል ^ንደሚጠቅም ተገንዝቤአለሁ።

ለጥናቱም የተመረጥኩት ባጋጣሚ መሆኑን አውቄያለሁ፡ ለጥናቱም ብቁ መሆኔንም ተረድቻለሁ።ጥናቱ የ†ሁኑን ጨምሮ ለሁለት ተከq qይ ጊዜያት ^ንደሚደረግ ተረድቻለሁ።

በጥናቱ መሣተፍ በኔ ፍቃዴኝነት መሆኑን †ውቄያለሁ ^ንዲሁም ጥናቱን በሙሉም ሆነ በከፊል የማቋረጥ መብት ^ንዳለኝ በትትክክል ተነግሮኛል ^ኔም አምኜበq ለሁ። በጥናቱ ወቅት የምሰጠው መልስ ሚስጥራዊነቱ የተጠበቀ ከመሆኑም በላይ ለማንም የማይገለፅ ^ንደሆነ ተገንዝቤያለሁ፡ በጥናቱ ውስጥ ሃሳቤ ^ንጂ ስሜ የማይገለጽ መሆኑ ተነግሮኛል።

በጥናቱ ለመሣተፍ ሲባል ምንም †ይነት ክፍያ ^ንደማይከፈለኝ ተነገሮኛል፡ ጥናቱ በኔም ሆነ በሌሎች ላይ ምንም †ደጋ †ያመጣም፡ በጥናቱ 30 ደቂቃ ^ንደሚወስድም ተገልያልኛል።

የዚህን ጥናት ውጠት ብጠይቅ የማግኘት መብት ^ንዳለኝ ተነግሮኛል፡ ^ንድሁም ስለጥናቱ ተጨማሪ መረጃ ለመጠየቅ ከፈለኩ †ቶ ሁሴን መኮንንን በስልክ ቁጥር 0911631634 ማነጋገር ^ንደምችል ተገልያልኛል። ከላይ የተገለፁትን ሀሳቦች በሙሉ ተረድቻለሁ፤ መስማማቴንም በሚከተለው ፊርማዬ †ረጋግጣለሁ።

የተሳqፊው ፊርማ፡ ----------ቀን፡ ----------

†መሰግናለሁ።

ለመረጃ ሰብሰባቢዎች መመሪያ::

ክፍል 2.1፡ ማህበራዊ ፣ና ኢኮኖሚያዊ ሁኔ q

በዚህ ክፍል የ ̂ርሰዎንና የቤተሰብዎን ሁኔ q ̂ጠይቀዎ q ለሁ::

ክፍል 2.2፡ ስለመውለድ ፍላጎት::

በዚህ የ ̂ርሰዎንና የትዳር አጋርዎ ስለመውለድና ምንያህል ልጆች ፣ንዲኖረዎት ̂ንደሚፈልጉ ̂ጠይቀዎ q ለሁ::

ክፍል 2.3: ፀረ ኤች አይ ቪ መዲሃኒቶችን ለመከ q ተል የሚጠቅሙ መረጃዎች፡

ከዚህ በ q ች በተመለከተው መጠይቅ መሠረት መረጃዎቹን ሙላ፡ወይም ሰንጠረዡ የበሽተኛውን ማህደር በማየት ̂ንድሁም በመጠየቅ የሚሞላ ነው::

ይህ መጠይቅ ለሁለት ተከ q q ይ ቀጠሮ ወቅቶች ይሞላል፡

1ኛ. ለፀረ ኤች አይ ቪ ህክምና የመጣችን ሴት ለይቶ ማወቅ

2ኛ. በመቀጠል በጥናቱ ለመሳተፍ ፍቃደኛ መሆኗን መጠየቅ

3ኛ. የመጀመሪያ መሠረተዊ መረጃዎችን ጠይቅ፣ ቀጠሮ ስጥ

4ኛ. ሁለተኛ ጊዜ የሚደረገውን መጠይቅ ወቅቱ ሲደርስ ጠይቅ ቀጠሮው ማለቁን መንገር::

የተጠያቂው አድራሻ

1. ክፍለ ከተማ፤---------- 2. ቀበሌ ----------
1. የቤት ቁጥር----------
2. ስልክ ቁጥር፤ የቤት---------- ሞባይል፤----------
3. ሌላ መረጃ ካለ፤ ----------
4. የቤት ለቤት ተንከባካቢ ካለ፤----------
5. የአቻ ለአቻ አስተማሪ ካለ፤----------
6. ኤ አር ቲ መለያ ቁጥር፡----------
7. የካርድ ቁጥር፡----------

ክፍል 2.1: የተሳqፊው ማህበራዊ አና ኢኮኖሚያዊ ኑሮ ሁኔq መረጃ

በዚህ ክፍል የˆርሰዎንና የቤተሰብዎን ሁኔq ˆጠይቀዎq ለሁ

ተ.ቁ	መጠይቅ	መልስና መለያ መስጫ	†ለፍ
221	ጠቅላላ የወር ገቢዎ ስንት ነው ? (በብር)	_____ ኢት. ብር 1. ገቢ የለኝም 2. ከብር 500 በተች 3. ከ500 - 1000 4. ከ1001 - 3000 5. ከ3000 በላይ 89. ሌላ ካለ ይገለጽ----------	
222	በአሁኑ ወቅት ያሉበት የሥራ ዓይነት ምንድነው?	1. ስራ የለኝም 2. ተማሪ 3. የቤት †መቤት 4. የቤት ሠራተኛ 5. የቀን ሠራተኛ 6. ነጋዴ 7. የቡና ቤት ሠራተኛ 8. የመንግሥት ሠራተኛ 9. የግል ሠራተኛ 89. ሌላ ካለ ይገለጽ----------	
223	በአሁኑ ወቅት የጋብቻ ሁኔq ˆንዴት ነው?	1. ያላገቡ ---------- 2. ያገቡ 3. ባል የሞተባቸው	

		4. የተፋቱ ---------- **5.ያልተጋቡ ጥንዶች/የያ q ንደኛያላቸው**	
224	**ያገቡ ከሆነ መጀመሪያ ሲያገቡ አድሜዎ ስንት ነበር?**	**----------**	
225	**ባለቤትዎ ሌላ ሚስት አላቸው ወይስ ˆርስዎ ብቻ ነዎት?**	**1. አኔ ብቻ ነኝ** **2. አላውቅም** ***89 መልስ የለም***	
226	**የተፋቱ ወይም የተለያዩ ከሆነ ሲጋቡ አድሜዎ ስንት ነበረ?**	***1.*_____ዓመት** **2. አላውቅም** **3. ፈቃደኛ አይደለሁም::**	
227	**ባለቤትዎ በሞት ከተለዩዎ፡ መቼ ነው የሞቱት?**	**ቀን ____ወር_____ዓመት_____**	

ክፍል 2.2፡ የˆርግዝና ˆና ልጅ የመውለድ ፍላጎትዎን ለማወቅ የተዘጋጀ መጠይቅ።

በዚህ የርሰዎንና የትዳር አጋርዎን ስለመውለድና ምንያህል ልጆች †ንዲኖረዎት †ንደሚፈልጉ ˆጠይቀዎ q ለሁ።

ቁ	መጠይቅ	መልስና መለያ	የመጠይቁ ወቀት	
			1	2
031	በአሁኑ ወቅት የግብረስጋ ግንኙነት ሁኔq ዎ አንዴት ነው?	ግንኙነት አደርጋለሁ- ----1 ግንኙነት አላደርግም -----2		
032	በአሁኑ ወቅት ልጅ አለዎት?	አለኝ ----------1 የለኝም --------2		
033	ስንት ልጆች አለ ዎት?	_____የልጆች ቁጥር ----1 አላውቅም ----------2 መልስ የለም ---------99		
034	ተጨማሪ ልጅ መውለድ ይፈልጋሉ?	አዎን-------- 1- አልፈልግም---2		
035	ተጨማሪ ልጅ መውለድ ከፈለጉ መቼ ነው መውለድ የሚፈልጉት?	ከ____ወራት/ወይም___ዓመት በኋላ አላውቅም ------ 1 ሌላ ካለ ይገለጽ ----2		
036	መልሱ አዎን ከሆነ ለምን ብዙ ልጆች ˆንዲኖረዎት ፈለጉ?	ከቫይረሱ መክላከያ መድሀኒት ስላለ-1 የጤንነቱ ሁኔq በመሻሻሉ ----2 አዲስ ስላገባሁ ----------3 ባለቤቱ ስለፈለገ----------4 በጤና ሞያተኞች ምክር -----5 ሌላ ካለ ይግለጹ----------89		
037	መልሱ አልፈልግም ከሆነ ለምን ተጨማሪ ልጅ መውለድ አይፈልጉም?	የምፈልገውን ያህል ልጅ ስላለኝ---1 ቫይረሱ ከናት ወደልጅ መተላለፉን ፈርቼ----------2 ያለኝ የገቢ ምንጭ ተጨማሪ ልጅ ለማሣደግ ስለማይበቃኝ --------3 በጤና ሞያተኞች ምክር ---------4 መውለድ ጤናዬን ይጎዳል ብዬ ስለምፈራ---------- 5 መልስ የለም ------- 99 ሌላ ካለ ይገለፅ------ 89		
038	በአሁኑ ወቀት የˆርግዝና መከላከያ ይጠቀማሉ?	አወን ----------1 አልጠቀምም --------2		
039	ምን አይነት የˆርግዝና መከላከያ ነው የሚጠቀሙት?(ዓነቱ ይፃፍ)	----------		

ተ.ቁ	መጠይቅ	መልስና መለያ ቁጥር		
040	የትዳር/የተቃራኒ ጾq አጋረዎ ልጅ ˆንዲኖርዎት ይፈልጋል?	አዎን ----------1 አይፈልግም --2		
041	ከቤተሰቦቻችሁ ልጅ ˆንዲወልዱ ተፅአኖ የሚያደርጉ አሉ?	አዎ ---------1 የለም ------2		
042	ተጽዕኖ አድራጊው ማነው?	የኔ ቤተሰቦች --------1 የባለቤቴ ቤተሰቦች----2 ሌላ ካለ ይገለጽ------89		
043	የጤና ባለሙያዎች መቼ መውለድ ˆንዳለብዎትስ አማክሮት ያውቃሉ?	አወን -----1 አያውቁም ----2		
044	ˆርስዎስ ጠይቀው ያውቃሉ?	አወን ------1 አላውቅም ----2		

ክፍል 2.3: ፀረ ኤች አይ ቪ መዲሃኒቶችን ለመከq ል የሚጠቅሙ መረጃዎች::

ከዚህ በq ች በተመለከተው መጠይቅ መሠረት መረጀዎቹን ሙላ::ወይም ሰንጠረዡን የበሽተኛ ውን ማህደር በማየት ˆንድሁም በመጠየቅ የሚሞላ ነው::

ተ.ቁ	መረጃ	የመጀመሪያ	ሁለተኛ
001	ሲዲ ፎር ሴል መጠን		
002	የመድሃኒት ከጀመሩ ስንትጊዜ ሆነዎት?		
003	ክብደት		
004	የባለቤትዎ ምርመራ ውጤት		
005	የደም ውጤትዎን ለባለቤትዎ ነግረዋል?		
006	መድሃኒቱን ሲጠቀሙ የተሠማዎት አለ?		
007	የጤንነትዎን ሁኔq †ንዴት ይገልፀq ል?		

መጠይቁን ጨርሠናል

ለነበረን ቆይq ክልብ አመሰግናለሁ

ክፍል 3. ለቃለ መጠይቅ የተዘጋጀ

ANNEX: 3.2.2. AMHARIC VERSION OF THE INFORMATION FORM:

ከቫይረሱ ጋር የሚኖሩ ሴቶች የመውለድ ፍላጎ ቸውንና ስለቤተሰብ ምጣኔ አጠቃቀም ያላቸውን አመለካከት ለመገምገም የተዘጋጀ መጠይቅ፡

<u>የመረጃ ቅጽ</u>

1. መግቢያ

ጤና ይስጥልኝ ስሜ _____ይባላል ከቫይረሱ ጋር የሚኖሩ ሴቶች የፀረ ኤች አይቪ በመኖሩ ምክንያት የመውለድ ፍላጎ ቸውንና የቤተሰብ ምጣኔ አጠቃቀማቸውን ለማየት በተዘጋጀው ጥናት አባል ነኝ። የጥናቱ ዓላማ ከቫይረሱ ጋር የሚኖሩ ሴቶች የመውለድ ፍላጎ ቸውንና የቤተሰብ ምጣኔ አጠቃቀም ያላቸውን አመለካከት ለመገምገም ነዉ፡ የ ርሰዎ ተሣትፎ ከቫይረሱ ጋር ለሚኖሩ ሴቶች የሚደረገውን ድጋፍና ንክብካቤ ለማሻሻል ትልቅ ጠቀሜ አለው።

2. የተሳትፎ መመረያና ሂደት/አተገባበር

ይህንን ፕሮጀክት ለመከወን ርሰዎ በፍቃደኝነት ንዲሳተፉ የተጋበዙ ሲሆን ፍቃደኛ ከሆኑ በ አማርኛ በተዘጋጀው መጠይቅ ላይ ሊመልሱልን ይችላሉ። ይህ መረጃ የሚሰበሰበው በቃለ መጠይቅ ነው። ለውይይት ንዳመች የምናደርገውን ውይይት በመቅረጫ ድምፅ ይቀዳል ይህም የሚደረገው ነጥቦቹን ላለመዘንጋት ሲሆን መረጃው በትክክል ከተወሰደ በ|ላ ይደመሰሳል። ውይይቱ ሲደረግ ስም በፍፁም †ይጠቀስም በምትኩ መለያ ንጠቀማለን ይህም ውይይቱ ስለሚያልቅ ንጠቀምበ ለን

ሀ) የሚሰጡት መረጃ ሚስጥረዊነቱ የተጠበቀ ነው፡ ሰመዎም ሆነ ሌላ መረጃ በፍፁም ለማንም †ይነገርም።

ለ) ይህንን መጠይቅ ለመሳተፍ ቢበዛ ከ45-60 ደቂቃ ይፈጃሉ፡ ሆኖም ላለመሣተፍ ከፈለጉ ጥናቱን ከጀመሩም በ|ላም ሆነ በፊት ማ ረጥ መብተዎ ነው።

ሐ) መጠይቁ በ†ማረኛ ስለተዘጋጀ ውይይቱ የሚደረገው በሚያውቁት ቋንቋ ነው።

3. ከተሣተፎ የሚገኝ ጥቅም/†ደጋ

ሀ) ጥቅም፡- በዚህ ጥናት በመሳተፍዎ ከቫይረሱ ጋር ለሚኖሩ ሴቶች የጤና አገልግሎት አቅረቦት ስርአት አንዲሻሻል በማረድግ ራሰዎን፤ቤተሰብዎንና ህብረተሰቡን ተጠቃሚ ያደርጋል።

ለ) **አደጋ/አለመመቸት**፡-በዚህ ጥናት ላይ በመሣተፍዎ ጊዜዎን ከመሰዋትዎ ውጭ ምንም የሚያመጣው ጉዳት የለም፡፡ ነገርግን የ^ርሰዎ ተሳትፎ በወሊድ ጉዳይ ላይ ተያያዥ መረጃ ለማመንጨት ጠቃሚ ነው፡፡

ሐ) **የተሳፎ ክፍያ**፡- በዚህ ጥናት በመሳተፍዎ የሚሰጥ ምንም ዓይነት ክፍያ አይኖርም፡፡

4. ሚስጥራዊነት፡- ከ^ርሰዎ የተገኘው መረጃ ለማንም ባለመገልፅ ሚስጢራዊነቱ ይጠበቃል፡፡ በመረጃው ስምዎ ሳይጠቀስ መለያ ቁጥር በመጠቀም በሚስጥር የሚቆለፍ ቦq ይቀመጣል፡፡

5. በጥናቱ ያለመሳተፍ ወይም የማቋረጥ መብት

በዚህ ጥናት ያለመሳተፍ መብትዎ የተጠበቀ ከመሆኑም ባሻገር ከጀመሩም በሀ|ላ ሆነ በፊት መቀጠል ካልፈለጉ በሙሉ ወይም በከፊል ማቋረጥ ይችላሉ፡፡ ይህንን በማድረግዎ በጤና አገልግሎትም ሆነ በሌላ አገልግሎት ላይ ምንም አይነት ተጽ^ኖ አይደርስበዎትም፡፡

6. የተሣqፊ መብት፡- ስለዚህ ጥናት ሊጠይቁ የሚፈልጉትን መረጃ ሁሉ የማግኘት መብት †ለዎት፡ ማንኛውንም መጠየቅ የሚፈልጉትን ጥያቄ **ለአቶ ሁሴን መኮንን በስልክ ቁጥር 0911631634 ደውለው መጠየቅ ይችላሉ**፡፡

ይህ ጥናት በአዲስ አበባ ዩኒቨርሲቲ የምርምርና ስነምግባር ቦርድ qይቶ ፀድkል፡፡

7. የጥናት ተሳትፎ ፍቃድ መጠየቅያ ቅጽ

ከላይ የተገለፁትን መረጃዎች በመገንዘብ በጥናቱ ለመሣተፍ ፍቃደኛ ነዎት?

1. †ዎ ---------- አመስግነው ወደ ቃለመጠይቁ ይለፉ፡፡

2. መሳተፍ አልፈልግም ---------- አመስግነቀው ቃለመጠይቁን ያቁሙ፡፡

የተሳqፊ ፊርማ---------- ቀን----------

†መሠግናለሁ፡፡

PART II: AMHARIC VERSION OF THE CONSENT FORM

ክፍል 3. ለቃለ መጠይቅ የተዘጋጀ

ከቫይረሱ ጋር የሚኖሩ ሴቶች የወሊድ ፍላጎትና የቤተሰብ ምጣኔ አጠቃቀም ያላቸውን አመለካከት ለመገምገም የተዘጋጀ መጠይቅ

የሥምምነት ቅጽ

በዚህ የፀረኤች አይ ቪ መዲሃኒት መኖር ኤች አይ ቪ ቫይረስ በደማቸው በሚገኝ ሴቶች የወሊድ ፍላጎትና የቤተሰብ ምጣኔ አጠቃቀምን ለማጥናት በተዘጋጀው መጠይቅ ለመሣተፍ ፍቃደኝነቴን ስገልፅ የሚከተሉትን በትክክል በመገንዘብ ነው፡፡

ስለጥናቱ ዓላማ በትክክል ተገንዝቤያለሁ፡፡ ጥናቱ የፀረኤች አይ ቪ መዲሃኒት መኖር ኤች አይ ቪ ቫይረስ በደማቸው በሚገኝ ሴቶች የወሊድ ፍላጎትና የቤተሰብ ምጣኔ አጠቃቀምን ለማወቅ ˆና ለዚሁ †ገልግሎት የሚደረገውን ድጋፍና ˆንክብካቤ ለማሻሻል ˆንደሚጠቅም ተገንዝቤያለሁ፡፡

ለጥናቱም የተመረጥኩት ባጋጣሚ በሆኑን አውቄያለሁ፡ ለጥናቱም ብቁ መሆኔንም ተረድቻለሁ፡፡ለውይይት ያመች ዘንድ ድምፃችን በመቅረፀ ድምፅ ˆንደማቀዳ ተረድቻለሁ፡፡

በጥናቱ መሣተፍ በኔ ፍቃዴኝነት ነው፡፡ ˆንዲሁም ጥናቱን በሙሉም ሆነ በከፊል የማቋረጥ መብት ˆንዳለኝ በትትክክል ተነግሮኛል ˆኔም አምኜበ q ለሁ፡፡ በጥናቱ ወቅት የምሰጠው መልስ ሚስጥራዊነቱ የተጠበቀ ከመሆኑም በላይ ለማንም የማይገለፅ ˆንደሆነ ተገንዝቤያለሁ፡ በጥናቱ ውስጥ ሃሳቤ ˆንጂ ሰሜ የማይገለፅ መሆኑንም ተነግሮኛል፡፡

በጥናቱ ለመሣተፍ ሲባል ምንም †ይነት ክፍያ ˆንደማይከፈለኝ ተነገሮኛል፡ ጥናቱ በኔም ሆነ በሌሎች ላይ ምንም †ደጋ †ያመጣም፡ በጥናቱ ከ45-60 ደቂቃ ˆንደሚወሰድ ተገልጾልኛል፡፡

የዚህን ጥናት ውጠት ብጠይቅ የማግኘት መብት ˆንዳለኝ ተነግሮኛል፡ ˆንድሁም ስለጥናቱ ተጨማሪ መረጃ ለመጠየቅ ከፈለኩ †ቶ ሁሴን መኮንንን በስልክ ቁጥር 0911631634 ማነጋገር ˆንደምችል ተነገሮኛል፡፡ ከላይ የተገለፀትን በሙሉ ተረድቻለሁ፤ ለዚህም በተለመደው ፊርማዬ †ረጋግጣለሁ፡፡

የተሳ q ፊው ፊርማ፡ ----------ቀን፡ ----------

†መሰግናለሁ

በክፍል 3 የሚከተሉትን ˆናያለን፡፡

ክፍል 3.1፡ኤች አይ ቪ በደማቸው ውስጥ በሚገኝ ሴቶች ጋር በግል ለሚደረግ ውይይት የተዘጋጀ መጠይቅ፡

ክፍል 3.2፡ ኤች አይ ቪ በደማቸው ውስጥ በሚገኝ ሴቶች ጋር የቡድን ውይይት፡

ክፍል 3.3፡ ከጤና ሞያተኞች ጋር ለሚደረግ የግል ውይይት፡ የተዘጋጀ መጠይቅ፡

ክፍል 3.1፡ኤች አይ ቪ በደማቸው ውስጥ በሚገኝ ሴቶች ጋር በግል ለሚደረግ ውይይት የተዘጋጀ መጠይቅ፡

በዚህ መጠይቅ †ርሰዎና ሌሎች ከቫይረሱ ጋር የሚኖሩ ሴቶች ስለ የመውለድ ፍላጎት ና የወሊድ መከላከያ አጠቃቀም ˆጠይቀዎ q ለሁ፡ በዚህ ውይይት ወቅት የሚነሱ ጉዳዮች ሁሉ ሚስጥራዊነተቸው የተጠበቀ መሆኑን በድጋሜ አረጋግጣለሁ፡፡

<u>የግል ቃለ መጠይቅ አጀንዳ፡፡</u>

1. **ለርስዎ ትክክለኛ መከላከያ የሚሉት የቱን ነው ˆስኪ በዝርዝር ይንገሩኝ?**

   ለምን መረጡት ዝርዝር ሁኔ q ውን ጠይቅ?

2. **ምን አይነት የˆርግዝና መቆጣጠሪያ ተጠቅመው ያውቃሉ?**

   ለምን መረጡት

   አቁመውስ ያውቃሉ? ካቆሙስ ለምን?

   በዚህ ያለዎት አመለካከት ˆንዴት ነው

3. **የˆርግዝና መቆጣጠሪያ ማለት ምን ማለት ነው?**
4. **ኮንዶም መቆጣጠሪያ ሊሆን ይችላል? ˆንዴት?**
5. **ኮንዶምን ከለላመከላከያ ጋር ተጠቅመው ያውቃሉ በዝርዝር ያስረዱኝ?**
6. **የˆርግዝና መቆጣጠሪያ ለመጠቀም ያለበዎት ችግር ከለ በዝርዝር ያሰረዱኝ?**
7. **ስለርግዝናም ሆነ ልጅ ስለመውለድ ወሳኙ ማንነው?**
8. **ኤች አይቪ ቫይረስ በሰውነ q ችን መኖሩ የምንጠቀመውን መቆጣጠሪያ አይነት ይወስነዋል ብለው ያምናሉ? ልጅ ለመዉለድስ?**
   አንዴት?
9. **ፀረ ኤች አይቪ መድሃኒት መኖሩስ?**
10. **ስለ ወሊድ ሁኔ q ና መከላከያው ከማን ጋር ተወያይተው ያውቃሉ? ማንን ማማከር ይፈልጋሉ?**
11. **ከጤና ሞያተኞች ጋር ያለዎት ግንኙነት ምን ይመስላል?**

12. ስለ ˆርግዝና መቆጣጠሪያና ወሊድ ሁኔq የጤና ሞያተኞችን አነጋግረው ያውቃሉ? ከሆነስ ለምን ያህል ጊዜ?
13. ሁለት ቫይረሱ በደማቸው ውስጥ ያሉ ወገኖች ፀረ ኤች አይ ቪ አስከጀመሩ ድረስ ያለኮንዶም ቢጠቀሙ ምን ጉዳት አለው? ያብራሩልኝ?

ባልና ሚስቶቹ የደም ውጤተቸው ካልተመሳሰለስ ኮንዶም አንዲጠቀሙ ይመክራሉ?

14. ሁለት ጥንዶች ˆስከተማመኑ ድረስ ኮንዶም መጠቀም አለባቸው ብለው ያምናሉ? ፖዘቲቭ የሆኑ ጥንዶች ኮንዶም መጠቀም ያለባቸው መቸ ነው::
15. የትዳር ጓደኛዎን ኮንደም ˆንዲጠቀም መክረው ያውቃሉ? አርስዎስ? ለምንና †ንዴት
16. ባለቤትዎ ኮንዶም አልጠቀምም ቢለዎት ምን ያደርጋሉ?
17. ያልተፈለገ ˆርግዝናን ለመከልከል በራስ መተማመኑ አለዎት? ኮንዶም ስለመጠቀምስ?

ውይይተችን አልቋል ሌላ ያላነሳሁት አለ መጨመር አለበት የሚሉት ካለ?

አመሰግናለሁ

መጠይቁ ያለቀበት ሰዓት _____ ቀን ---------- ዓ.ም ----------

ክፍል 3.2፡ የቡድን ውይይት፡

በዚህ መጠይቅ የሚሳተፉት ቫይረሱ በደማቸው ውስጥ ኖሮ ˆርስ በርሳቸው ግልፅ ያወጡትን ይመለከተል

በዚህ መጠይቅ የጋራ ውይይት ይኖረናል፡ ˆርሰዎ በዚህ ውይይት የሚያነሱት ሁሉ ሚስጥራዊ ነው:: አስፈላጊ ጉዳዮችን ለመያዝ ያመች ዘንድ በቴፕ ይቀዳል:: በግል የማንንም ስም አንጠቀምም ለውይይት ያመቸት ዘንድ ሌላ መለያ ዕንጠቀማለን:: የምናደርገውን ውይይት ዋናዋና ነጥቦች የሚይዝልን ይኖራል::

<u>የቡድን ውይይት አጀንዳ</u>

1. ምን አይነት የወሊድ መቆጣጠሪያ ተጠቅመው ያውቃሉ?

   የቱን ይወዳሉ? የሚጠሉትስ?

   ለምን መረጡት በዝርዝር ያስረዱኝ

2. የትኞቹ መቆጣጠሪያዎች ናቸው ˆርግዝናን የሚከላከሉት? ኤች አይቪንስ?
3. በጣም ጥሩ መቆጣጠሪያ የሚሉትሰ ምን መሆን አለበት?በዝርዝረ ያስረዱኝ
4. በማህበረሰባችን ሴት ልጅ የወሊድ መቆጣጠሪያ መጠቀም አለባት? ኮንዶምስ? ˆንዴትና ለምን?
5. ኮንዶም ለመጠቀም ችግሮች ናቸው የሚላቸውን በዝርዝ ያስረዱኝ?

6. ለወደፊት ልጅ ˆንዲኖርዎት ይፈልጋሉ? ለምን
7. ልጅ ስለመውለድ ወሳኙ ማን ነው?
8. የባለቤትዎስ ፍላጎት?
9. የቤተሰብ ተጽዕኖስ አለ?
10. ስለ ወሊድ ሁኔqና መከላከያው ከማን ጋር ተወያይተው ያውቃሉ? ማንን ማማከር ይፈልጋሉ?
11. ከጤና ሞያተኞች ጋር ያለዎት ግንኙነት ምን ይመስላል?
12. ስለ ˆርግዝና መቆጣጠሪያና ወሊድ ሁኔq ከጤና ሞያተኞች አነጋግረው ያውቃሉ? ከሆነስ ለምን ያህል ጊዜ?
13. በዚህ ጉዳይ የጤና ሞያተኞች አስተዋጽኦ የቱን ያህል ነው?
14. ከሚጠቀሙበት የጤና ተቀም ውስጥ ያለውን ገልግሎት ˆንዴት ይገልፀተል?

ውይይqችን አልቋል ሌላ ያላነሳሁት አለ መጨመር አለበት የሚሉት ካለ?

አመሰግናለሁ

መጠይቁ ያለቀበት ሰዓት _____ ቀን

ክፍል 3.3፡ ከጤና ሞያተኞች ጋር ለሚደረግ የግል ውይይት፡ የተዘጋጀ መጠይቅ፡

1. የጤና ተቋሙ ስም _____
2. የጤና ተቋሙ ደረጃ _____
3. መረጃ የተሠጠበት ቀን _____ ወር _____ዓ.ም_____
4. የተጠያቂው የት/ት ደረጃ_____ ሙያው _____
5. የተጠያቂው የሥራ ልምድ ከጉዳዩ ጋር በተዛመደ ሁኔq _____

የስምምነት ቅጽ ይነበብ!

<u>አ ጀ ን ዳ</u>

1. ከሚሰጡት ፀረ ኤች አይቪ መድሃኒት በተጓዳኝ ወሊድና ስለመከላከል ከበሽተኞች ጋር ይወያያሉ? ይህም የማን ሃላፊነት ነው ብለው ያምናሉ?
2. ስለ መውለድ ና መቆጣጠሪያ አስመልክቶ ምን አይነት መልዕክት ነው የሚያስተላልፉት ?
3. ቫይረሱ በደማቸው ለሚገኝ ወገኖች ስለመከላከል መልዕክት ሲያስተላልፉ ችግር አግጥሞት ያውቃል?
4. ኤች አይቪ ቫይረስ ጋር የሚኖሩ ሴቶች ማርገዝ ይችላሉ ብለው ያምናሉ ?
5. ስለወሊድና መከላከያ አገልግሎት ለመስጠት ችግር አለብዎት?

6. ኤች አይቪ ቫይረስ ጋር የሚኖሩት ራሳቸውን አንዲጠብቁ የሚረዳ፤ ስልጠና ወስደዋል?
7. የሚያገለግሉአቸው ሴቶች የወሊድ መቆጣጠረያ ከየት ነው የሚያገኙት ይህንን ሲያደርጉ ያጋጠመዎት ችግር ካለ?
8. ኤች አይቪ ቫይረስ በደማቸው ያለ ሴቶች ልጅ መውለድ አለባቸው ብሎ ማህበረሰቡ ያምናል? በዝርዝር ያስረዱኝ?
9. ኤች አይቪ ቫይረስ በደማቸው ያለ ሴቶች መከላከያ ቢጠይቁ አመራጭ አለዎት

ውይይተችን አልቋል ሌላ ያላነሳሁት አለ፡ መጨመር አለበት የሚሉት ካለ?

በጣም አመሰግናለሁ፡፡

መጠይቁ ያለቀበት ሰዓት _____ ቀን ---------- ዓ.ም ----------

ANNEX 3. PAPER I-IV

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REPRODUCTIVE HEALTH

RESEARCH Open Access

Fertility intentions among HIV positive women aged 18–49 years in Addis Ababa Ethiopia: a cross sectional study

Hussen Mekonnen Asfaw* and Fikre Enquselassie Gashe

Abstract

Background: Given the degree of HIV epidemic among women and the current antiretroviral therapy (ART) scale up in Ethiopia; considering the issue of fertility is vital to ensure the delivery of integrated reproductive health along with prevention services provided to positive women. This study was aimed to assess fertility intentions of women living with HIV attending public health institutions (hospitals & health centers) in Addis Ababa, Ethiopia.

Methods: Institution based cross sectional survey was conducted, among 1855 HIV positive, women aged 18–49 years selected from different public health facilities in Addis Ababa; from June to October 2012. Information was gathered by using interviewer administered questionnaires. Data were double entered in EPI Info version 3.5.2 software, cleaned finally exported to IBM SPSS statistics version 20 for analysis. Logistic regression models were used to predict the association of study variables and adjusted for possible confounders.

Result: Overall, 44% of women reported fertility intention. ART users had higher fertility intention (AOR; 1.26, 95% CI; 1.01 to 1.60) than ART naive. In addition to this, having partner being on sexual relationship, young age, being single and having fewer or no children were found to be predictors of fertility intentions. The presence of ART, improvement of health condition and the influence of husband were the main reasons for childbearing intentions of women in the study area.

Conclusion: A considerable proportion of women reported fertility intention. There was an association between fertility intentions and ART use. It is important for health care providers and policy makers to strengthen the fertility need of HIV positive women along with HIV care so that women may decide freely and responsibly on their fertility issues.

Keywords: Fertility intension, HIV, ART use, Women, Addis ababa, Ethiopia

Introduction

Human immune deficiency virus (HIV) continues to profoundly affect women across the world [1]. The burden is however, heaviest in sub-Saharan Africa [2]; approximately 58% of adults living with HIV [1] and 53% of all adult deaths in the region are women [3]. In Ethiopia women (2.9%) than men (1.9%) are living with HIV [4].

Most of these women are particularly vulnerable to HIV due to complex burden they have [5] including physiological, social vulnerability and gender inequalities [3]. Since infected women are of childbearing age [4], they risk infecting their children and thus face difficult choices about childbearing.

Despite the risks and challenges; studies elsewhere revealed that, HIV positive women continue to desire children, after knowing their HIV-positive status [6-8]. Even infection like HIV does not seem to negatively modify subsequent reproductive intentions of some patients [9,10]; also majority of them intended to have more than two children [11,12]. The desire of having children in the future has significant implication for the transmission of HIV to sexual partner and new-born [13,14].

The advent of antiretroviral therapy (ART) has improved quality of life and survival for people living with

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HIV(PLWH) and now days HIV infection can be seen as a chronic manageable disease as a result many will contemplate child bearing [5,15-17].

With access to ART and preventive care, people living with HIV are better able to consider parenthood [18] as compared to early days. Earlier studies involving women on ART have revealed that most of pregnancies among positive women might be intentional [19-21]. Subsequent studies from sub-Saharan Africa reported antiretroviral therapy access has an influence on fertility intentions of HIV positive women [10,22,23].

ART has not only transformed their physical state but it has also transformed mostly what had been desire into intention [24]. Since childbearing intentions are among predictors of subsequent fertility behaviors of women [25], hence creating responsive reproductive health services to HIV positive women in relation to ART, requires clear understanding of expressed childbearing intentions.

Although, ART has influence in improving quality of life and reduce mother to child transmission of HIV virus (MTCT) in developed countries [21]; vertical transmission accounts for more than 90% of pediatric AIDS in prevalent areas [26] as a result, reproductive assistance to HIV positive women [17,27] is important to have informed decision making about child bearing and child rearing [15].

Indeed existing evidences in Ethiopia have indicated fertility desire of positive men and women was ranging from about 34 to 45% [28-31]. However information on situation of fertility intentions, differences of fertility intentions by ART use and reasons to have future children among HIV positive women are lacking.

Ethiopia is a country characterized by high fertility 5.6% children per childbearing woman [4], cultural value is attached with children and being childless considered as social violation and stigma. While majority (91%) of women deliver at home without skilled attendant [32]; identification of factors associated to have children among HIV positive women is useful for establishing intervention priorities in reproductive health for these populations.

Furthermore, in the light of preventive efforts undergoing in Ethiopia, it becomes imperative to assess fertility intention, with emphasis to HIV positive women who have been enrolled in care; in order to proffer appropriate prevention measures and better integration of reproductive health services.

Thus, this study will attempt to update existed knowledge and inform the policy makers and programs to promote efforts for provision of safer and healthier reproductive options among HIV positive women in the study area.

Methods

Study area

The study was conducted in Addis Ababa, the capital city of Ethiopia and the seat of the African Union. As a chartered city, Addis Ababa has the status of both a city and a state. From its lowest point, around Bole International Airport, at 2,326 m above sea level in the southern periphery, the city rises to over 3,000 m in the Entoto mountains to the north [33,34]. Addis Ababa has 10 sub-cities (top layers) and 116 woredas (lower administration units). Each sub-city is expected to serve for a total population of 300,000 and each woreda serving for the population of 30,000 [34].

Fee based antiretroviral treatment began in 2003 and free ART was launched in Ethiopia in 2005 [35]. Both public and private health institutions have been offering ART services in the city [36]. A total of five public hospitals, twenty five health centers, one clinic and thirteen private hospitals were offering ART [37] and about 124,983 enrolled, 76,035 ever started and 54,667 currently on ART [4].

Study design and sampling procedures

Institution based cross sectional survey was conducted in selected public health facilities (hospitals & health centers) of Addis Ababa, from June to October, 2012.

Sample size was determined using single proportion formula with the assumption of fertility desire of HIV positive women being 44.7% [30] with 5% level of significance a design effect of 2 and an addition of 10% non response rate. With these assumptions, the minimum required sample size was 806. However, the total sample size calculated for comparison purposes was 1924. As large sample size increases the precision of the findings by reducing the level of sampling error [38], we took 1924 HIV positive women aged 18–49 years.

Respondents were selected principally using multistage sampling technique. Initially, unique identification number was given to each public hospitals and health centers. Secondly, a total of five public hospitals and seven health centers were selected by lottery methods, then proportion of sample size allocations were carried out according the patient load in each public institution. Systematic random sampling was used to select the study subjects from the selected ART sites.

Data collection

Data were collected using interviewer administered structured questionnaires. The data collection tool was adopted from previous similar studies [23,39] and adapted in to the local context. The data collection instrument was prepared in English and translated in to the local language (*Amharic*), by expert who is fluent in both languages and back translated to English by another expert to ensure consistency and accuracy.

Data collectors were recruited based on previous experience in data collection, relevance of qualification, training on (VCT, ART) and ability of the local language.

Training was given for five consecutive days in order to make data collectors and supervisors familiar to the tool and interview techniques. Emphasis was also given during training on the ethical issues, safety of the participants as well as interviewers, minimization of under-reporting and maintaining confidentiality. The data collection tools were pre-tested in the randomly selected ART units out of the study site on 10% of the total sample size.

A field work manual was developed by the principal investigator and used by all research teams. To ensure the quality of the data and minimize inter-interviewer variation, about 5% of the respondents were re-interviewed at random by the principal investigator and supervisors and checked for consistency. In addition, daily check and follow up were done by the supervisors and investigator.

Measurement

The primary outcome variable for the study was self-reported fertility intentions, which was defined by answers to the question: "Are you currently planning to have (more) children in the future?" Women were free to respond "Yes", "No", or "Don't know, the small proportion of women who responded "Don't Know" (less than 5%) were included in the "No" category. There was little difference in the proportion of women reporting "Don't know" by HIV and HAART use status. Variables known to be associated with fertility intentions were included in the analysis to provide an adjusted estimate of the association.

Covariates included were age, religion, marital status education, employment, monthly household income, current sexual partnership status, number of living children, and HIV clinical variables including recent CD4 count, nadir CD4 count, and WHO stage of disease. Medical record review was also conducted to confirm HAART history and obtain clinical data, including World Health Organization stage of disease and CD4 cell count.

Antiretroviral therapy (ART) use was defined as use of one of three antiretroviral medications either efaveranze (EFV) or Neverapin(NVP) based [5,35,39], first line drugs or use of non nucleotide reverse transcriptase inhibitors (NRTIs) with protease inhibitors(PIs) (lepona-vir/ritonavir(LPV/r) or atazanavir/ritonavir (ATV/r)) backbone of second line drugs [35].

Analysis

The pre coded responses were double entered in EPI Info version 3.5.2 software, for checking its consistency then was exported to SPSS for window version 20 for statistical analysis used were percentage, frequency, bivariate and multiple logistic regression analysis. Variables found to be significant at bivariate level, ($P < 0.05$), were selected and included in to multiple logistic regression models. Then multiple logistic regression analyses model were used to calculate Odds ratio with 95% confidence interval to estimate association and to control the potential confounding variables. Strength and direction of the association presented using odds ratios relative to the reference category and 95% confidence levels.

Ethical considerations

The research was approved for scientific and ethical integrity by the Institutional Review Board (IRB) of College of Health Sciences, Addis Ababa University. Written permission was obtained from health bureau of the Addis Ababa city government. Consent was obtained from medical directors and respective unit heads at each health institutions. Verbal consent was also obtained from individual clients. In order to make informed decision, sufficient information was given to each participant. Confidentiality was strictly maintained for each piece of information and the interview was conducted in strict private place. At the end of the interview general information, referral and follow up linkages were made for those who need.

Results

Socio-demographic characteristics of study participants

A total of 1924 women were approached for participation (Table 1), of whom 1855 (96.4%) consented to participate in the study. Five hundred forty six (29.4%) were in the age range of 30–34 years. the mean age of the respondents was 31.3 years (±5.6SD).

The study participants were predominantly Orthodox 1461 (78.8%) and Amhara 1104 (59.5%) by their religion and ethnicity respectively. Three hundred seventy nine (27.4%) were unemployed and 509 (20.5%) reported working in private business. Six hundred eighty nine (37.1%) of the participants have completed grade 1–8, followed by those who completed grade nine to twelve 599 (32.3%). Five hundred twenty two (28.1%) reported to have no monthly income at all and 509 (27.4%) were getting monthly income of less than 500 Ethiopian Birr (equivalent to 27.8 USD). Concerning marital status about 50% of the participants were currently married and 19.5% were single.

Fertility intentions and clinical characteristics of study participants

Eight hundred fifteen (44%) women reported that they intended to have (more) children in the future irrespective of their ART use (Table 2).One thousand sixty two (57.3%) women reported ever had sexual relationship. Eight hundred sixty four (81%) women reported that

Table 1 Socio-demographic characteristics of HIV positive women aged 18–49 years in Addis Ababa, Ethiopia (n = 1855)

Characteristics	Frequency (%)
Age(years)	
18-24	189 (10.2)
25-29	522 (28.1)
30-34	546 (29.4)
35-39	421 (22.7)
40-49	177 (9.5)
Mean age in years	**31.3 (±5.75D)**
Ethnicity	
Amhara	1104 (59.5)
Oromo	420 (22.6)
Gurage	165 (8.9)
Others(Tigrea, Siltea, Gamo, welayta, yem, worji)	166 (8.9)
Religion	
Orthodox Christian	1461 (78.8)
Muslim	197 (10.6)
Others (Protestant, catholic, Jubbah)	197 (10.6)
Marital Status	
Single	361 (19.5)
Married/cohabited	945 (50.9)
Widowed	283 (15.3)
Divorced	266 (14.3)
Educational status	
Illiterate	243 (13.1)
Informal education	150 (8.1)
Grade 1–8 completed	689 (37.1)
Grade 9–12 completed	599 (32.3)
Above 12 grade	174 (9.4)
Occupation	
Unemployed	379 (20.5)
Housewife	342 (18.4)
Daily laborer	279 (15.0)
Merchant	100 (5.4)
CSW**	34 (1.8)
Government worker	212 (11.4)
Private Business	509 (27.4)
Monthly income (in Birr)*	
No Income(dependent)	522 (28.1)
Birr below 500	509 (27.4)
Birr 500-3000	521 (28.1)
Birr 1001-3000	258 (13.9)
Birr above 3000	45(2.4)

*1USD 18 Birr (currency of Ethiopia at the time of data collection).
**CSWs commercial sex workers.

their sexual partner/husband being tested for HIV of whom 630 (73%) reported that their partners are positive; while 217 (25%) reported that their partners were negative. Six hundred and five (32.6%) women reported having one child followed by 408 (22.0%) two children and 558 (30.1%) no children.

One thousand six hundred fifty five (89.2%) women have disclosed their sero-status to someone else, but the remaining 200 (10.8%) did not. Of those who disclosed, 906 (85%) reported the disclosure of their sero-status to sexual partner/husband, but, 140 (13%) did not disclose their sero-status to their sexual partner.

Factors associated with fertility intentions

ART users had higher fertility intention **(AOR; 1.26, 95% CI; 1.01 to 1.60)** than HAART naïve. Women in the age range of 40–49 years **(AOR; 0.14, 95% CI, 0.08 to 0.24)**, age range 35–39 **(AOR, 0.46; 95% CI, 0.31 to 0.66)** and age range 30–34 **(AOR, 0.60; 95% CI, 0.42 to 0.84)** were respectively less likely to report fertility intention in comparison to younger women in the age range of 18–24 years (Table 3).

Marital status has also an association with fertility intension in with divorced were (AOR, 0.59 95% CI, 0.42 to 0.83) and widowed women (AOR; 0.26; 95% CI; 0.18 to 0.39), respectively had less fertility intention to that of single women. However, no significant association with fertility intention was found between married/cohabited and single women (AOR; 1.10, 95% CI; 0.34 to 1.41). Women who completed grade eight (AOR, 1.62, 95% CI; 1.15 to 2.27) and those who completed grade 12 and above were two times (AOR; 2.16; 95% CI; 1.32 to 3.53), respectively, were more likely to have future children than illiterate women.

Fertility intention also declines by number of children women have. The odds of fertility intention for women who have one child (AOR, 0.34, 95% CI, 0.26 to 0.44), women who have two children (AOR; 0.08, 95% CI, 0.06 to 0.11) and women with three or more children (AOR: 0.30, 95% CI; 0.02 to 0.06) than women with no children, respectively. HIV test of the partner has an association with fertility intention, women who do not know whether their partner have taken HIV test or not were less likely to report fertility intention (AOR, 0.44; 95% CI; 0.25 to 0.78) than women who knew the test of their partner, while women who are living with partner who did not test at all were equally likely to report fertility intention. The finding also reviled that women who have sexual relationship were less likely to report fertility intention (AOR, 0.46, 95% CI, 0.25 to 0.48) than women who did not report presence of sexual relationship with partners (Table 3).

Reasons to have children

There was a wide range of reasons why women intended to have additional children as shown in (Figure 1). Four

Table 2 Fertility intention and clinical characteristics of HIV positive women aged 18–49 years in Addis Ababa, Ethiopia (n = 1855)

Fertility intention and clinical characteristics	Freq. (n = %)	Fertility intention and clinical characteristics	Freq. (n = %)
		Recent CD4 count (n = 1855)	
ART use (n = 1855)		<200	266 (14)
Yes	823 (44.3)	200 to <350	589 (32)
No	1032 (55.7)	350 or greater	998(54)
Fertility intention (n = 1855)		**Nadir CD4 Count (Lowest)** (n = 1855)	
Yes	815 (44)	Less than 200 cell/mm^3	785 (42)
No	1040 (56)	200 to less than 350 cell/mm^3	610 (33)
Have sexual partner (n = 1855)		350 and above	460 (25)
Yes	1062 (57.3)	**WHO stage of disease** (n = 1855)	
No	793 (42.7)	Stage I/II	1096 (59)
Partner tested (n = 1062)		Stage III/IV	759 (41)
Yes	864 (81)	**Disclosed HIV Status to husband/partner** (n = 1062)	
No	104 (10)	Yes	906 (85)
Do not know	94 (9)	No	140 (13)
HIV status of partner (n = 864)		No response	16 (2)
Positive	630 (73)	**Disclosed HIV status to someone else** (n = 1855)	
Negative	217 (25)	Yes	1655 (89.2)
Do not know the status	17 (2)	No	200 (10.8)
Ever lost a child by HIV (n = 1297)		**Number of living children** (n = 1855)	
Yes	45 (3)	0	558 (30.1)
No	1228 (95)	1	606 (32.6)
Do not know the cause	24 (2)	2	408 (22.0)
		3+	284 (15.3)

hundred thirty seven (53%) women reported as a result of the presence of ART, followed by improvement of health condition 145 (18%). Other reasons mentioned were influence of husband/partner 70 (9%), like children as they are gift of God 41 (5%), advice of health workers 37 (4%), to reach ideal family size 34 (4%) and the like.

Discussion

Our finding highlighted that the prevalence of fertility intention is 44% which is consistent with the previous studies in South Africa 44% & 45% respectively [22,23]; but higher than reports from northern part of the country (18.5%) [40], Uganda (24% and 28.6%) respectively [17,41], Canada (25.8%) [21] and lower than other study from Canada(57%) [42]. The difference might be related to study site, time and study subject difference. The other plausible difference could be associated that being HIV positive did not remove childbearing intentions rather there exist diversity.

The proportion of women who reported fertility intention also showed variation with being on ART; this might be an indication of women hoping the presence of ART. Furthermore, wide range of reasons were reported as to why women intended to have children; such as presence of ART, improvement of health conditions, influence of husband, like children as they are gift of God, advice of health workers and to attain ideal family size. This suggests the need of integrating target oriented and individualized counseling along with comprehensive care and support activities. This study has shown that HAART use has an association with fertility intentions in which women who are on HAART reported more fertility intention over those who did not. The finding is consistent with previous studies [11,43] but different from other studies in other Uganda and South Africa [17,23]. The difference might be associated with variation in terms of ART access and community awareness. The other plausible reason might be related to multifaceted nature on the predictors of childbearing intentions. Our finding also indicated that no association with duration of ART and fertility intention which is similar to previous study from South Africa [23].

The study has indicated that women being single, low parity and young age were directly associated with fertility intention, the finding is similar to study conducted elsewhere in south Africa [23] but different from studies

Table 3 Adjusted analysis of variables associated with fertility intentions among positive women aged 18–49 years in Addis Ababa (n = 1855)

Variables	Fertility intension		Odds ratio (95% CI)
	Yes	No	AOR (95% CI)
Age (years)	N (%)	N (%)	
18-24	112 (13.7)	77 (7.4)	1.00
25-29	284 (34.8)	238 (22.8)	0.81 (0.57-1.15)
30-34	245 (30.1)	301 (28.9)	0.60 (0.42-0.84)*
35-39	151 (18.5)	270 (26)	0.46 (0.31-0.69)
40-49	23 (2.8)	154 (14.8)	0.14 (0.08-0.24)
Marital status			
Single	100 (23.3)	171 (16.4)	1.00
Married/cohabited	485 (59.5	460 (44.2)	1.10 (0.34-1.41)
Widowed	47 (5.8)	236 (22.7)	0.26 (0.18-0.39)
Divorced	93 (11.4)	173 (16.6)	0.59 (0.42-0.83)
Educational status			
Illerate	72 (8.8)	171 (16.4)	1.00
Informal education	57 (7.0)	93 (8.9.0)	1.43 (0.91-2.27)
Grade 1-8 completed	306 (37.5)	383 (36.8)	1.62 (1.15-2.27)*
Grade 9–12 completed	286 (35.1)	313 (30.0)	1.74 (1.21-2.50)
Above grade 12	94 (11.5)	80 (7.7)	2.16 (1.32-3.53)
Currently having partner/husband			
No	257 (31.5)	536 (51.5)	1.00
Yes	558 (68.5)	504 (48.5)	0.46 (0.25-0.84)
Number of living children			
0	384 (47.1)	174 (16.7)	1.00
1	301 (36.9)	304 (29.2)	0.34 (0.26-0.44)**
2	95 (11.7)	313 (30.1)	0.03 (0.06-0.11)
3+	35 (4.3)	249 (23.9)	0.30 (0.02-0.06)
ART use			
ART- naïve	339 (41.6)	484 (46.5)	1.00
Receiving ART	476 (54.4)	556 (53.5)	1.26 (1.01-1.60)**
Partner tested[#]			
Yes	466 (44)	398 (37)	1.00
No	53 (5)	51 (5)	0.8 (0.6-1.2)
I do not know	39 (4)	55 (5)	0.6 (0.4-0.9)*

#considers only those who have reported presence of partner =1062 * P value <0.05, **P value <0.001.

conducted in Uganda and Zimbabwe [17,24]. The difference is related to study subject difference.

As it is indicated those widowed and divorced were less likely to report childbearing intention compared to single. The probable reason might be related to those groups of women had children or social instability might impose fear about childbearing. However, single women might intend children from cultural influence; in Ethiopian community having children is highly valued [40] and considered as social security.

The respondents with twelve grades and above had two (AOR 2.16)-fold higher in childbearing intention compared to illiterates, this is similar to study conducted in South Africa [23]. This is related to participants who under gone formal education might hope the presence of ART. Furthermore, education especially of women, contributes to decision-making autonomy on fertility issues and knowledge of family planning. Studies have shown that women's relative decision-making autonomy, independent of men authority facilitates fertility regulation [44,45].

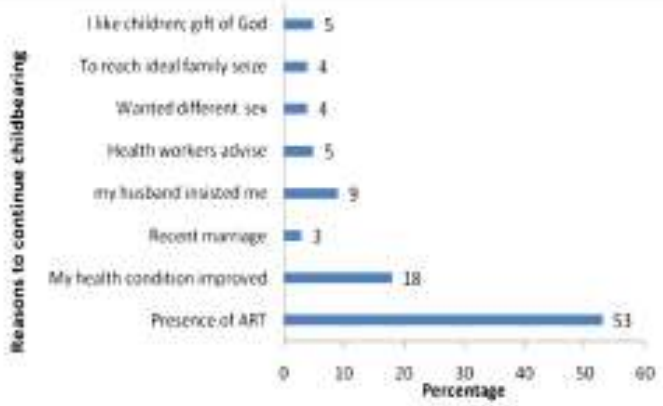


Figure 1 Reasons to have children in the future among positive women, aged 18-49 years in Addis Ababa (n=815).

Overall, being on ART, young age, being single, having fewer or no children, education of grade twelve and above, were identified to be predictors of fertility intensions. However, the sero-status result of spouse, religion, ethnicity, income, occupation and clinical profile such as WHO staging, current CD4 and nadir CD4 cell count respectively were not predictors of fertility intention among HIV positive women in the study area.

Limitations

Our study has several limitations: the cross-sectional nature of the study may cause difficulty of determining the direction of the association between study variables and the association can only be discussed in terms of plausibility. There was a risk of social desirability bias where by HIV-positive women may over or under report their fertility intension because of pressure from health workers and community members to practice protected sex.

As to the strengths of this study, the respondents have been selected by random sampling technique with relatively large sample size. Again the team already adopted instrument conducted in other developing countries [23]. Precautions have been taken during the selection of experienced data collectors.

Conclusion

Our finding suggests there is an association between fertility intentions and ART use, young age, being single, having fewer or no children in the study area. It is necessary integrated sexual and reproductive health services and HIV and ART care be available for HIV positive women. It is also important for health care providers and policy makers to strengthen the fertility need of HIV positive women along with HIV care so that women may decide freely and responsibly on their fertility issues.

Competing interests

We declare that no financial or non-financial competing interests related to this study.

Authors' contributions

Both authors contributed equally during design and conduct of the study. HM and FE participated in data collection, statistical analysis and interpretation of findings. HM prepared the draft then FE revised the draft of the paper. All authors read and approved the final content of the manuscript.

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Contraceptive use and method preference among HIV positive women in Addis Ababa, Ethiopia: a cross sectional survey

Hussen Mekonnen Asfaw* and Fikre Enquselassie Gashe

Abstract

Background: Prevention of unplanned pregnancies among people living with HIV is essential component of "Global Plan" even in the context of expanded access to highly active antiretroviral therapy (HAART). The study aimed to assess whether contraceptive use and method preference varied by the use of HAART among HIV positive women in Addis Ababa, Ethiopia.

Methods: A cross sectional facility based survey was conducted from June to October, 2012 information was gathered using interviewer administered questionnaire and document review was conducted to confirm HIV status and clinical review. A sample of 1418 HIV positive women including 770 women receiving HAART and 648 HAART-naive recruited randomly from different health institutions in Addis Ababa. Data were principally analyzed using logistic regression.

Result: Overall, 71% women reported using contraception (75% among HAART users and 65% HAART naïve women). Male condom and injectables are the most preferred contraceptive methods among both groups. The odds of contraceptive use among HAART users was higher (AOR 1.60, 95% CI; 1.30-2.12) than HAART naïve women. In addition to this, presence of partner (AOR 2.32, 95% CI 1.60-3.40), disclosure of HIV status to husband (AOR 2.23; 95% CI 1.21-4.12), presence of living children: one (AOR 1.7; 95% CI 1.03-2.40), two (AOR 2.6; 95% CI 1.7-4.02) and three (AOR 3.3; 95% CI 1.90-5.60) respectively were found to be predictors of contraceptive use among HIV positive women.

Conclusion: The contraceptive profile of women in the study area mainly dependent on male condom use, this indicates the need to better integrate tailored counseling and contraceptive options with care and support activities that targets HIV positive women. Moreover, emphasis should be given to dual contraceptive method use along with their regular follow up irrespective of their HAART use.

Keywords: Contraceptive use, HIV positive women, HAART use, Addis Ababa, Ethiopia

Background

Sub-Saharan Africa is the region most severely affected by HIV [1]. Women of productive age account for 58% of the people living with HIV [2] and 63% of all adult deaths [3]. In Ethiopia, more women (2.9%) than men (1.9%) are living with HIV [4]. Most of these women are particularly vulnerable to HIV due to complex burden they have [5] including physiological, social vulnerability and gender inequalities [3].

Furthermore, HIV positive women have risk of unplanned pregnancies [6]. Worldwide, two in every five pregnancies are unplanned [7]. Previous studies of 42 sub-Saharan Africa countries, 10-65% of women reported that their last pregnancy had been unplanned [8]. Similarly, 62% of women on ART from South African [9] and 59% of HIV positive women from Kenya reported unplanned pregnancy [10].

Prevention of unintended pregnancy among HIV positive women is the second element of prevention of mother to child transmission of HIV (PMTCT) [11] which is an important means to address the associated problems of

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HIV positive women and children [12]. It is reported to be cost effective [13], improves quality of life [14], reduces maternal and child mortality [3,12,15-17] and reduces number of positive infants by keeping their mother alive [18].

Significant improvements have been demonstrated by PMTCT in low and middle income countries [19]. The percentage of pregnant women with HIV receiving antiretroviral therapy(ART) using PMTCT in sub Saharan Africa increased to 50% [3]. However, PMTCT efforts to date gave less emphasis to the contraceptives options [20].

Despite the potential contribution of family planning(FP) to the prevention of HIV infection [12] and unintended pregnancies [3], contraceptive use in sub-Saharan Africa remains low [21]. The percentage of married women aged 15–49 using modern contraceptive methods ranges from 12% in Mozambique and 14% in Ethiopia to 27% in Rwanda [4]. In addition, previous reports indicated that twenty five percent of women with HIV worldwide and one in four married women from sub-Saharan Africa has unmet need for family planning [22].

Even in the context of expanded access to ART for HIV-infected pregnant women, family planning still needs to be strengthened to avoid unintended pregnancies [23]. Existing evidence revealed that women living with HIV including those taking ARVs can use almost all contraceptive methods safely and effectively [15,16] with variation in method preference [5,12,24-27].

Previous studies from different parts of Ethiopia reported that of those who have ever used at least one contraceptive method after HIV diagnosis, condom, injectables and abstinence were reported to be the most preferred methods [28-30]. However, information on informed choice of contraceptive methods, reasons for selection of methods and the influence of HAART on the contraceptive use of women entering HIV care is scarce.

Ethiopia is the second populous country in Africa [31], characterized by high fertility of 5.4% children per woman [4], having more children is highly valued [32]. Moreover, majority of women deliver at home (usually without skilled attendant) where complications of childbirth cannot be addressed, including the risk of mother-to-child transmission of HIV [31]; identification of factors associated with contraceptive use and method preference among HAART using women is an important issue to be addressed.

Thus, given the importance of contraceptive use in preventing unintended pregnancy, perinatal transmission of HIV [3] and ART scale up in Ethiopia; it is worth to assess contraceptive use and method preference of HIV positive women. It is anticipated that this research will update existing knowledge, inform policy makers and programmers to support safer and healthier reproductive options among HIV positive women in the study area.

Methods

The study was conducted in health facilities of Addis Ababa, Ethiopia. In the country, Antiretroviral treatment began in 2003 and free ART was launched in 2005 [33]. Since then, a total of five public hospitals and twenty five health centers have been offering ART [34]. About 124,983 people living with HIV were enrolled of whom 76,085 have started and 54,667 are currently on ART in the city [4]. Amhara is the predominant ethnic group and Amharic is commonly spoken language in the study area [35].

Study design and sampling procedures

A cross sectional survey was carried out at selected public health facilities (hospitals & health center) of Addis Ababa between June and October, 2012. Non-pregnant women aged 18–49 years, reported having sexual relationship six months prior to the data collection period were eligible to participate in this study.

Sample size was computed using two-proportion formula with the assumption of proportion of contraceptive use among HIV positive women receiving HAART and HAART naïve being 86% and 82%, respectively [12], with a minimum detectable odds ratio of 2 at 5% level of significance power of 90% with a design effect of 2 and 5% addition for non-response rate a total sample size of 1924. However, the number of women who satisfy the eligibility criteria at the records of the health facilities was 1418 (770 HAART users and 648 HAART- naïve).

Study participants were selected using multi-stage sampling technique. Initially, five hospitals and seven health centers were selected by lottery methods, and then the total sample size was proportionally allocated to the selected facilities according to the client load in each institution. Finally individual study subjects were selected using a systematic random sampling technique from the records of each selected facility.

Data collection

Data were collected using interviewer administered structured questionnaires adopted from previous similar study [12]. The questionnaire has been translated in to the local language (*Amharic*) by experts in both languages and back translated to English by another person to ensure consistency and accuracy. Data collectors were all female nurses recruited based on their previous experience in data collection, those who had previous training on ART and/or HIV counseling and fluency of the local language. Moreover, training was given for five consecutive days on interview techniques, sampling and ethical issues, emphasizing the importance of safety of participants and interviewers, minimization of under reporting and maintaining confidentiality. A pre-test of the questionnaire was conducted in selected ART units which were not included in

the main study. The data collection process was closely supervised by the principal investigator.

Measurements

The primary outcome variable was self-reported contraceptive use for the previous six months prior to the data collection period. In this study contraceptive use was defined the use of any method including injectables (Depot), implants (implanol or jadelle), oral contraceptive pill (OCP), intra uterine contraceptive device (IUCD), male/female condom, diaphragm, permanent methods such as tubal ligation and hysterectomy. Dual contraceptive method was defined as use of primarily the male condom with hormonal or other contraceptive methods like IUCD. Consistent condom use was defined as the use of condoms always or frequently in all vaginal sexual relationships with casual and/or steady partners. Women who used condoms sometimes or rarely were regarded as inconsistent condom users.

Independent variables in this study included were age, education, employment, monthly household income, sexual partnership status, HIV sero-status of partner/husband, number of living children, HIV test of children, disclosure of HIV status to partner/husband and discussion with partner/husband or health workers about contraception. Medical record review was also conducted to confirm HAART history and obtain clinical data including World Health Organization stage of disease and CD4 cell count.

Antiretroviral therapy (ART) is treatment of people infected with human immunodeficiency virus (HIV) using anti-HIV drugs [36]. The standard treatment consists of a combination of at least three drugs (often called "highly active antiretroviral therapy" or HAART) that suppress HIV replication [37]. Highly active anti retroviral therapy (HAART) use defined as use of one of three antiretroviral medications either Efaveranze (EFV) or Neverapin (NVP) based [5,12,38] first line drugs or use of combination drugs with protease inhibitors(PIs) backbone of second line drugs [38]. We considered women to be HAART users if they had been receiving HAART for at least one month and HAART-naive if they had never taken HAART, prior to the data collection period.

Analysis

The pre coded responses were double entered in EPI Info version 3.5.2 software, for checking its consistency then was exported to SPSS for window version 20 for statistical analysis. Uses, preference and reasons for selection of contraceptive methods are presented using descriptive statistics. Variables found to be significant at bivariate level, ($P < 0.05$), were selected and included in to multiple logistic regression models. Then multiple logistic regression analyses were used to calculate Odds ratio with 95% confidence interval to estimate association and to control the potential confounding variables. Strength and direction of the association between contraceptive use and potential socio-demographic, reproductive health and clinical factors were presented using odds ratios relative to the reference category and 95% confidence levels.

Ethical considerations

The research was approved for scientific and ethical integrity by the Institutional Review Board (IRB) of College of Health Sciences, Addis Ababa University. Written permission was obtained from health bureau of the Addis Ababa city government. Consent was obtained from medical directors and respective unit heads at each health institutions. Verbal consent was also obtained from individual clients. In order to make informed decision sufficient information was given to each participant. Confidentiality was strictly maintained for each piece of information and the interview was conducted in strict private place. At the end of the interview general information, referral and follow up linkages were made for those who need.

Results

Socio-demographic characteristics of study participants

Of the total 1418 women who participated in this study, 423 (29.8%) were in the age range of 30–34 years, with mean (standard deviation) of 31.1(±5.5). The study participants were predominantly Orthodox Christians 1109 (78.2%) and Amhara 849(59.9%) by religion and ethnicity, respectively. Occupationally, 373 (26.3%) participants had their own private business and 292(20.6%) were housewives. Concerning educational status of the participants, 538 (37.9%) have completed grade 1–8, 466(32.9) grade 9–12 and 133(9.4%) with higher education. Four hundred nineteen (29.5) earn monthly income of less than 1000 Ethiopian birr and 390 (27.5%) women were with no monthly income. Concerning marital status, about 62% of the participants are currently married/cohabited and 242 (17.1%) were single (Table 1).

Reproductive and clinical characteristics of study participants

About 55%(422/769) of HAART users and 45% (347/769) HAART naive women had recent CD4 counts of 350 cell/mm3 and 42% (363/863) and 58% (500/863) HAART users and HAART naive, respectively were in WHO stage of disease I or II. About 70.3% (997/1418) of the study participants reported ever had sexual partner in their life time. Of these women who had partners, 81.8% (816/997) reported that their partners were tested for HIV, and 73.8% (602/816) are positive for HIV. Of the total study participants, 463(32.7%) women reported having one child, 321 (22.6%) two children and 428(30.2%) no children. About 59% (507/859) and 41% (352/859) HAART users and HAART naive women, respectively, had disdosed HIV

Table 1 Socio-demographic characteristics of HIV positive women in Addis Ababa, Ethiopia (n = 1418)

Socio-demographic characteristics	HAART users (n = 770)	HAART Naïve (n = 648)	Total
	No (%)	No (%)	No (%)
Age (in years)			
18-24	58 (7.5)	91 (14.0)	149 (10.5)
25-29	219 (28.4)	203 (31.3)	422 (29.8)
30-34	245 (31.8)	178 (27.5)	423 (29.8)
35-39	186 (24.2)	122 (18.8)	308 (21.7)
40-49	62 (8.1)	54 (8.3)	116 (8.2)
Mean (SD) Age in years	31.6 (±5.2)	30.4 (±5.8)	31.1 (±5.5)
Ethnicity			
Amhara	462 (60.0)	387 (59.7)	849 (59.9)
Oromo	167 (21.7)	147 (22.7)	314 (22.1)
Gurage	70 (9.1)	54 (8.3)	124 (8.7)
Tigre	47 (6.1)	32 (4.9)	79 (5.6)
Others (Silte,gamo, welayta, yem, Sidama)	24 (3.1)	28 (4.3)	52 (3.7)
Religion			
Orthodox Christian	604 (78.4)	505 (78.0)	1109 (78.2)
Muslim	84 (10.9)	76 (11.7)	160 (11.3)
Others (Protestant, catholic, Jehbah)	82 (10.6)	67 (10.3)	149 (10.5)
Marital status			
Single	126 (16.4)	116 (17.9)	242 (17.1)
Married/cohabited	486 (63.4)	397 (61.3)	883 (62.4)
Widowed	81 (10.5)	55 (8.5)	136 (9.6)
Divorced	75 (9.7)	80 (12.3)	155 (10.9)
Educational status			
illiterate	91 (11.8)	78 (12.0)	169 (11.9)
Informal education	50 (6.5)	62 (9.6)	112 (7.9)
Grade 1-8 completed	273 (35.5)	265 (40.9)	538 (37.9)
Grade 9-12 completed	290 (37.6)	176 (27.2)	466 (32.9)
above 12 grade	66 (8.6)	67 (10.3)	133 (9.4)
Occupation			
unemployed	131 (17.0)	133 (20.5)	264 (18.6)
Housewife	166 (21.6)	126 (19.4)	292 (20.6)
Daily laborer	96 (12.5)	112 (17.3)	208 (14.7)
Merchant	40 (5.2)	36 (5.6)	76 (5.4)
CSW	18 (2.3)	13 (2.0)	31 (2.2)
Government worker	90 (11.7)	84 (30.6)	174 (12.3)
Private business	229 (29.7)	144 (22.2)	373 (26.3)
Monthly Income (in Birr)*			
No Income	192 (24.9)	198 (30.6)	390 (27.5)
Birr below 500	217 (28.2)	144 (22.2)	361 (25.5)
Birr 500-1000	227 (29.5)	192 (29.6)	419 (29.5)
Birr 1001-3000	112 (14.5)	97 (15.0)	209 (14.7)
Birr above 3000	22 (2.9)	17 (2.6)	39 (2.8)

*Birr = 1USD = 18.80 ETB.

status to partner/husband. Furthermore, 66.6%(664/997) women reported they had open discussion with partner/husband (Table 2).

Use and preference of contraceptive methods

Overall contraceptive use was 71% (75% (579/770) and 65% (422/648) among HAART users and 42% HAART-naïve women, respectively). Four hundred five (28.8%) reported did not use contraceptive methods six months prior to the data collection period while contraceptive status was not known for 9 (0.6%) women (Table 3). In general male condom is the most preferred contraceptive method 45.7% (468/1001) followed by injectables 30.5% (306/1001) (Table 3).

Reasons given in choosing contraceptive methods

The primary reason given for contraceptive use was for protection against STIs in 28% (281/1001) followed by prevention of unwanted pregnancy in 21% (208/1001), among women using any method. Other reasons mentioned were convenient to use 18% (180/1001), easy to use 14% (138/1001), does not interfere with sexual activity 8% (82/1001), advise of health workers 5% (50/1001), and the like (Figure 1).

Factors associated with contraceptive use

Using the logistic regression model, a number of socio-demographic, HAART use, sexual history, disclosure behavior and clinical factors were identified as significant predictors of the association of contraceptive use (Table 4).

The results showed that HAART use has influence on women's decision to use contraceptives compared to HAART naïve women, the odds of contraceptive use among HAART users was significantly higher, adjusted for other potential confounders (AOR 1.60, 95% CI; 1.30 to 2.12). Similarly, women who had sexual partners currently were more likely to use contraceptives than women with no partners (AOR 2.32, 95% CI 1.60 to 3.40). On the other hand, married/cohabited (AOR 0.41, 95% CI 0.21 to 0.80) and widowed women (AOR 0.31, 95% CI 0.12 to 0.84) respectively, had less likely to use contraceptive methods compared to that of single women.

Disclosure of HIV status, especially, with sexual partner has significant association with contraceptive use, women who disclosed their HIV status to partner were about two times more likely to use contraceptive than women who did not (AOR 2.23, 95% CI 1.21 to 4.12). Furthermore, women who reported open discussion with their partner/husband were about two times more likely to use contraceptives than those who reported no discussion (AOR 2.0, 95% CI; 1.60 to 2.60).

Contraceptive use also increased by the number of living children women have. The odds of contraceptive use for women who have one child (AOR 1.7, 95% CI 1.03 to 2.40), two children (AOR 2.6, 95% CI 1.7 to 4.02) and three or more children (AOR 3.3, 95% CI 1.90 to 5.60), respectively, were higher than women with no children. Similarly, the odds of contraceptive use was higher for women whose children are tested for HIV than women who did not (AOR, 1.6; 95% CI; 1.01 to 2.40).

Discussion

The issue of contraceptive use and method preference among women enrolled in HIV care and treatment programs in the study area has important implications for the health of women and their infants. Overall the proportion of contraceptive use was 71% irrespective of their HAART use. Previous studies from Uganda and South Africa reported higher than our finding 85% and 78%, respectively [5,12]. On the other hand, our finding showed higher proportion than previous findings from other developing countries, which reported between 28 and 53% [39–42] and than earlier reports within the country reported 43 to 54% [29,30,43]. The difference is associated with study time and study subject differences.

The result is different from contraceptive use of the general female population in Addis Ababa reported 63% [44]. The most probable reason might be that HIV positive women have frequent contact with health care providers and demand for contraceptives might be higher than the general population.

In the logistic model, we found that, adjusted for potential confounders, contraceptive use was significantly higher among women receiving HAART than HAART naïve; which was also reported by previous studies from Uganda and South Africa [5,12]. This may be a reflection of the fact that continual exposures to secondary prevention messages along with ART might have impact on contraceptive use. Even though, male condom is the most preferred method by all study participants, it was higher among those receiving HAART compared to HAART naive women (54 vs 37%, respectively).

While the use of dual contraceptive methods (condom with other methods) is safe to prevent unintended pregnancy and HIV [25,45]. However, low proportion (14.7%) of dual contraceptive method use was observed among HAART users. This may reflect that the study population is at risk of acquiring sexually transmitted infection including drug resistant HIV virus.

Our findings has also showed that women with living children have reported contraceptive use than those with no children; the result was consistent with studies reported from Uganda and South Africa [5,12]. This suggests that the desire to have children among those with no children is higher for obvious reasons and consequently avoiding contraceptive use.

Furthermore, women who have open discussion with partner or health care providers have better contraceptive

Table 2 Reproductive and clinical characteristics of HIV positive women in Addis Ababa, Ethiopia (n = 1418)

Reproductive and clinical history	HAART users (n = 770)	HAART naives (n = 648)	Total
	No (%)	No (%)	No (%)
Nadir CD4 count			
0-199 cells/mm^3	466 (79.2)	97 (20.8)	563 (39.7)
200-349 cells/mm^3	225 (45.9)	265 (54.1)	490 (34.6)
350+ cells/mm^3	79 (21.6)	286 (78.4)	365 (25.7)
Current CD4 count			
0-199 cells/mm^3	125 (64.4)	69 (35.6)	194 (13.7)
200-349 cells/mm^3	223 (49)	232 (51)	455 (32.1)
350+ cells/mm^3	422 (55)	347 (45)	769 (54.2)
WHO stage of Disease			
Stage I/II	363 (42)	500 (58)	863 (60.9)
Stage III/IV	407 (73.3)	148 (26.7)	555 (39.1)
Presence of partner			
Yes	560 (56.2)	437 (43.8)	997 (70.3)
No	210 (50)	211 (50)	421 (29.7)
Partner tested (n = 997)			
Yes	479 (59)	337 (41)	816 (81.9)
No	47 (48)	50 (52)	97 (9.7)
I do not know	34 (40)	50 (60)	84 (8.4)
Test result of current partner (n = 816)			
Positive	347 (58)	255 (42)	602 (73.8)
Negative	119 (60)	73 (40)	199 (24.4)
I do not know	13 (87)	2 (13)	15 (1.8)
Child tested (n = 990)			
Yes	377 (58)	273 (42)	650 (65.6)
No	175 (51)	165 (49)	340 (34.3)
Disclose HIV status to anybody			
Yes	722 (56.3)	558 (43.7)	1280 (90.3)
No	48 (34.7)	90 (65.3)	138 (9.7)
Disclosed HIV status to husband (n = 997)			
Yes	507 (59)	352 (41)	859 (86.2)
No	53 (38.4)	85 (61.6)	138 (13.8)
Number of living children			
0	218 (51)	210 (49)	428 (30.2)
1	260 (51)	208 (49)	468 (32.7)
2	180 (56)	141 (44)	321 (22.6)
3+	112 (54.3)	94 (45.7)	206 (14.5)
Discussed with husband/Partner (n = 997)			
Yes	384 (57.8)	280 (42.2)	664 (66.6)
No	176 (52.8)	157 (47.2)	333 (33.4)
Discussed with HCWs*			
Yes	553 (54.7)	457 (45.3)	1010 (71.2)
No	217 (52.6)	191 (47.2)	408 (28.8)

*HCWs health care workers.

Table 3 Use and preference of contraceptive methods among HIV positive women in Addis Ababa, Ethiopia

Type of contraceptives	HAART users (n = 770)	HAART Naives (n = 648)	Total
	No (%)	No (%)	No (%)
Contraceptive use			
Yes	579 (75.2)	422 (65.1)	1001 (70.6)
No	186 (24.2)	222 (34.3)	408 (28.8)
Not known	5 (0.6)	4 (0.6)	9 (0.6)
Method preference			
Injectables (Depot)	146 (25.2)	160 (37.9)	306 (30.5)
Oral contraceptive pills (OCP) of available type	55 (9.4)	46 (11)	101 (10.0)
Intra uterine contraceptive device (IUCD)	16 (2.7)	12 (2.8)	28 (2.8)
Implant (Jaddelle or Implanon)	48 (8.2)	45 (10.5)	93 (9.2)
Consistent male condom use	310 (53.5)	158 (37.4)	468 (46.7)
Female condom	4 (0.7)	1 (0.2)	5 (0.5)
Categories of contraceptives methods			
Dual contraceptive methods (condom and hormonal methods)	98 (14.7)	114 (21.6)	212 (18)
Barrier Methods (male or female condom)	317 (47.5)	161 (30.6)	478 (40)
Hormonal methods (OCPs, Implant and Depot)	249 (37.5)	251 (39.9)	500 (42)

N.B. a woman may have reported the use of ≥1 method value will not be added to 100%.

profile than their counterparts. This suggests that disclosure of HIV status to a partner may be important to get support from family and discussion can clarify uncertainties about contraceptives and possibly to strengthen confidence of women. Besides women who knew the HIV status of their children reported contraceptive use than their counter parts, this could be related to women who tested their children have better exposure and more concerned on the prevention of unintended pregnancies.

Our study has several limitations; due to cross-sectional nature we are unable to make definitive conclusions on cause and effect relation. The association could only be discussed in terms of plausibility. Furthermore, social desirability and stigma may have biased respondents' answers and may not be generalizable to HIV-positive female population in the care.

As to the strengths of this study, the respondents have been selected by random sampling technique with relatively large sample size. Again, the team already adopted instrument conducted in other developing countries [12]. Precautions have been taken in selection of experienced data collectors.

Conclusion

The study identified that HIV positive women in general and women receiving HAART in particular are more likely to use contraceptives with preference of male condom. Its protection against STIs followed by prevention of

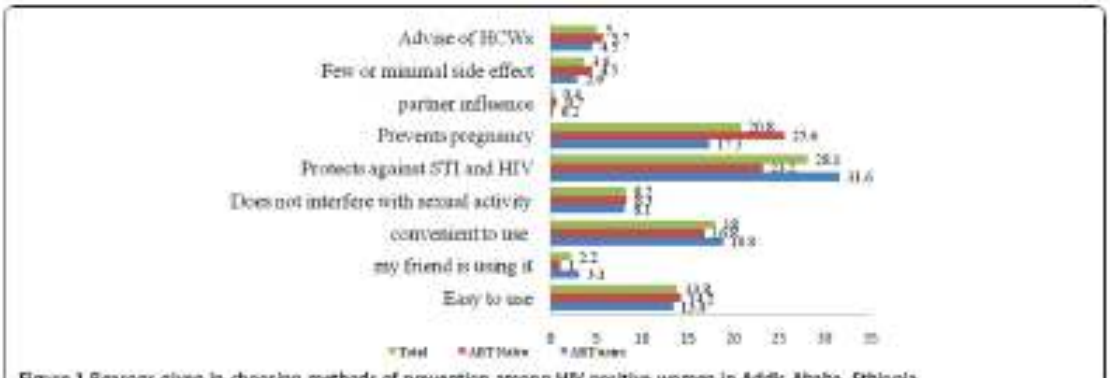


Figure 1 Reasons given in choosing methods of prevention among HIV positive women in Addis Ababa, Ethiopia.

Table 4 Adjusted analyses of variables associated with contraceptive use among women in Addis Ababa, Ethiopia

Variables	Contraceptive use		Adjusted odds ratio AOR (95% CI)
	Yes	No	
	No. (%)	No. (%)	
HAART use			
No	422 (42.2)	226 (55.4)	1.00
Yes	579 (57.8)	191 (45.6)	1.6 (1.30-2.32)**
Presence of partner			
No	236 (23.6)	185 (44.4)	1.00
Yes	765 (76.4)	232 (55.6)	2.32 (1.60-3.40)**
Disclosed HIV status to husband			
No	87 (11.4)	51 (22.1)	1.00
Yes	679 (88.6)	180 (77.9)	2.23 (1.21-4.12)*
Discussed with husband			
No	240 (31.5)	99 (42.9)	1.00
Yes	526 (68.7)	132 (57.1)	2.0 (1.60 2.60)**
Discussed with HWs			
No	242 (24.9)	166 (39.8)	1.00
Yes	759 (75.1)	251 (60.2)	1.60 (1.20 2.03)**
Number of living Children			
0	375 (37.5)	153 (36.7)	1.00
1	329 (32.9)	134 (32.1)	1.7 (1.09-2.40)**
2	241 (24.1)	80 (19.2)	2.6 (1.7-4.0)**
3+	156 (15.6)	50 (12.0)	3.3 (1.90 5.80)**
Marital status			
Single	168 (16.8)	74 (17.7)	1.00
Married/Cohabited	673 (67.2)	212 (50.8)	0.41 (0.21 0.80)*
Widowed	73 (7.3)	63 (15.1)	0.31 (0.12-0.84)*
Divorced	87 (8.7)	68 (16.3)	0.80 (0.30-2.90)
Child tested for HIV			
No	236 (32.5)	104 (39.3)	1.00
Yes	490 (67.4)	160 (60.6)	1.60 (1.10-2.40)*

*P value < 0.05 **P-value < 0.001
Adjusted for age, education and other SES.

unwanted pregnancy and convenient to use were among the reasons mentioned for selection of the contraceptive methods. Furthermore, having one or more living children, disclosure of HIV status to sexual partner, open discussion with partner or health care workers found to be predictors of contraceptive use in the study area. Low proportion of dual contraceptive method use was observed among HAART users. This may reflect that the study population is at risk of acquiring sexually transmitted infection including drug resistant HIV virus.

The contraceptive profile of women in the study area mainly dependent on male condom use, this indicates the need to better integrate tailored counseling and contraceptive options with care and support activities that targets HIV positive women. Moreover, emphasis should be given to dual contraceptive method use along with their regular follow up irrespective of their HAART use.

Lastly extensive and longitudinal study is needed to validate current findings so as to inform for policy makers to establish better sexual and reproductive health services for positive women to have planed and safe fertility goal.

Competing interests

We declare that there are no financial or non-financial competing interests related to this study.

Authors' contributions

Both authors contributed equally during design and conduct of the study. HM and FF participated in data collection, statistical analysis and interpretation of findings. HM prepared the draft then FF revised the draft of

the paper. The two authors read and approved the final content of the manuscript.

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PAPER III

Change in fertility intentions 12 months after antiretroviral therapy initiation among HIV positive women in Addis Ababa, Ethiopia: A prospective follow up study

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ABSTRACT

Background: With access to highly active antiretroviral therapy (HAART) and preventive care people living with HIV are better able to consider childbearing as compared to previous days. HAART has not only transformed their physical state but also desire to have children. The study aimed to assess change in fertility intentions 12 months after ART initiation among HIV positive women in Addis Ababa, Ethiopia.

Methods: Institution based follow up study was conducted, among 360 HIV positive women in Addis Ababa; from June 2012 to October 2013. Logistic regression model was used to assess the influence socio-demographic, reproductive health and clinical characteristics on the change in fertility intention of women.

Result: Overall, 41.0 %(147/360) of the women reported fertility intentions at the baseline, while 48.3 %(174/360) reported fertility intentions 12 months after follow up. The proportion of fertility intention 12 months after antiretroviral therapy (ART) initiation was higher among HAART initiated 55.8% (106/190) than HAART naïve 40% (68/170) women. The adjusted analysis indicated that change from the need of no more children at the baseline to the need more children 12 months after ART initiation was significantly associated with woman's HAART use (AOR, 2.46, 95%CI, 1.20-5.20), marital status: single (AOR, 5.32, 95%CI, 1.10-25.92), married (AOR, 6.34 95%CI, 1.43-27.99), respectively more likely to report fertility intention than divorced/ widowed women.

Conclusions: HAART use is significant predictor of change from the need of no more children at the base line to the need of more children 12 months after ART initiation suggests that additional effort is necessary to avail integrated family planning and HIV services to address safe fertility goal of women living with HIV in the study area.

Key words: Fertility intention, follow up study, HIV positive women, HAART use, Ethiopia.

Introduction

Sub-Saharan Africa is the region most severely affected by HIV(1). Women of reproductive age account for 58% of the people living with HIV(2) and 53% of all adult deaths(3). In Ethiopia, more women (2.9%) than men (1.9%) are living with HIV(4). Most of these women are particularly vulnerable to HIV due to complex burden they have including physiological, social vulnerability and gender inequalities (3, 5) . Since infected women are of childbearing age(4), they risk infecting their children and thus face difficult choices about childbearing.

Despite the risks and challenges; studies from sub-Saharan Africa revealed that, HIV positive women continue to desire children, after knowing their HIV-positive status (6-8). Studies reported that HIV does not seem to negatively modify subsequent childbearing intentions (9, 10); also majority of them intended to have more than two children (11, 12). The desire of having children in the future has significant implication for the transmission of HIV to sexual partner and new-born (13, 14). With access to HAART and preventive care however, people living with HIV are better able to consider childbearing(15) as compared to previous days. Earlier studies involving women on ART have revealed that most of pregnancies among positive women might be intentional (16-18). Subsequent studies from sub-Saharan Africa reported highly active antiretroviral therapy (HAART) access has an influence on fertility intentions of HIV positive women (10, 19, 20).

Study from different parts of Africa reported that pregnancy rate of women on HAART was significantly higher than HAART naïve(21). study from South Africa stated that HAART increased the fertility desire of couples overtime(6) and rates of pregnancies among women recently initiated ART with low CD4 count and high viral loads is high (22). Furthermore,

women on ART quickly became pregnant even before their CD4 count was improved because they wanted to fulfill their womanhood roles but also they wanted to prove that they were healthy(23)

These all indicated that HAART has not only transformed their physical state but it has also transformed mostly what had been desire into intention(24). Since childbearing intentions are among predictors of subsequent fertility behaviors of women(25), hence creating responsive reproductive health services to HIV positive women in relation to HAART, requires clear understanding of expressed childbearing intentions. However, it may be difficult to sustain the fertility intentions over time as it is affected by changing life situations of women as a result difficult to capture such issues by cross sectional studies conducted earlier on in the area. Furthermore, there are efforts undergoing in Ethiopia to address issues of prevention of mother to child transmission of HIV(PMTCT) (26, 27). It is worth to update such efforts and provide information about existed situation and change in fertility intentions over time. Thus, the purpose of this study was to assess change in fertility intention of HIV positive women 12 months after ART initiation in Addis Ababa.

METHODS

Study area

The study was conducted in health facilities of Addis Ababa, Ethiopia. In the country, fee based antiretroviral treatment began in 2003 and free ART was launched in 2005(28). Since then, a total of five public hospitals and twenty five health centers have been offering ART(29). About 124,983 people living with HIV were enrolled of whom 76,035 have started and 54,667 are currently on ART in the city (4).The fertility rate is 2.4 children per reproductive aged women in Addis Ababa(4).

Study design and sampling procedures

A follow up study was carried out at selected public health facilities (3 hospitals and two health centers) of Addis Ababa were selected by lottery methods between June, 2012 and October, 2013. A total of 360 HIV positive women including 190 newly initiated and 170 HAART naïves were included for the study (Figure 1).

Sample size was computed using two-proportion formula with the assumption of proportion of fertility intentions among HIV positive women who were HAART naïve and 12 months after HAART initiation being 26.6% and 21.5% respectively(30), with a minimum detectable odds ratio of 2 at 5% level of significance power of 80% and addition of 20% non response rate a total sample size of 407.

Sampling procedures

Women were eligible if at enrolment they were between 18-49 years, sexually active in the past 3 months, had not undergone tubal ligation, hysterectomy, not diagnosed permanently infertile. Non pregnant, willing to conduct document review; being newly initiated ART and HAART naïves were involved.

A total of 5678 (men and women) were receiving care at the selected sites, of those, 3118 were women at reproductive age. Of those, a total of 360 women (including 190 HAART initiated and 170 HAART naïve) were involved in the study (Figure 1 and Table 1).

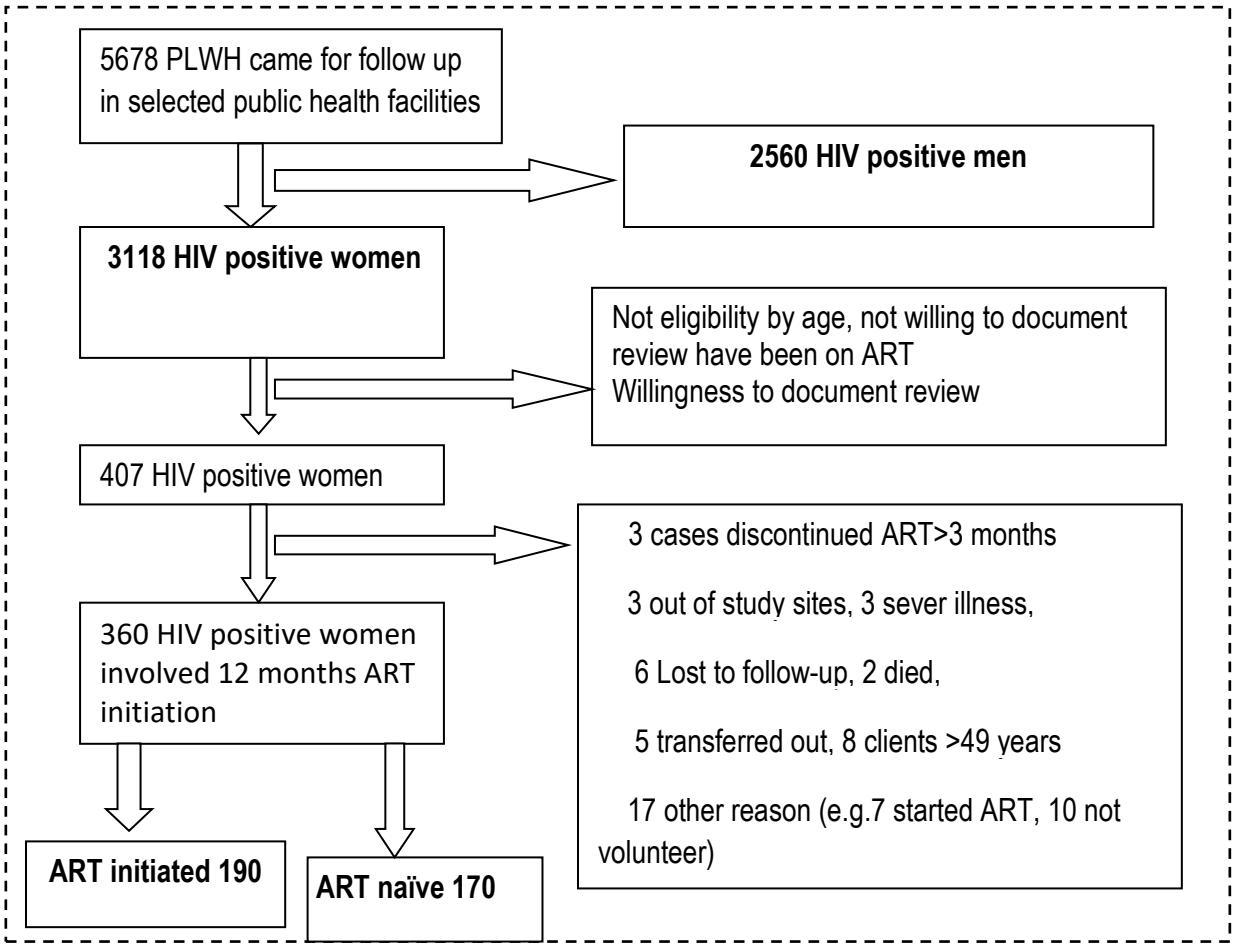


Figure 1: Schematic representation of women enrolment and flow chart for change in fertility intension study Addis Ababa, Ethiopia, 2014

The study was linked with the routine activities of each health institutions. The recruitment procedure was conducted using appointment log book and screening was conducted every day. Women who came for follow up and for ART initiation were identified separately and screened for their eligibility such as age, HAART initiation, HAART naïve, WHO staging and other eligibilities for inclusion. Identification number was given for the eligible women to help us as a sampling frame for the selection the study participants using systematic random sampling.

Patients were enrolled only after they gave informed consent. No financial remuneration was offered to participants. Once enrolled, a baseline questionnaire was administered in a private room, while the participants waiting to see ART clinic staff.

The follow-up for both groups (women on ART and HAART naïve) was scheduled in line with the respective institutional schedule for two times over a period of one year. ART initiated women were interviewed during refill (treatment collection) and HAART naïve women were interviewed during their appointment for CD4 cell testing. For ease of follow up unique identification mark labeled with date of base line survey and the schedule of next appointment was labeled on patient's history book and questionnaire collected as a baseline data. A study staff reminded them the next interview time when they collect their drug or came for other follow up.

During the baseline interview, the contact details of each participant (cell phone, other contact address e.g. relatives or friends cell phone, including unique ART number, next appointment schedules) were recorded. In addition, detailed direction of patients home, place of work or other convenient places was recorded. Every effort was made to minimize loss to follow-up. For example, if a woman missed her appointment, phone contact was done, home visiting for interview was done for those who were willing to be visited at home, or another convenient appointment time or place was made

When the client was not traced for 3 months either by four calls and/or one home visit and failed to trace the home or found that she is relocated to an inaccessible place, and then she was considered as lost to follow up.

Data collection procedure

Data were collected using interviewer administered structured questionnaires. The questionnaire was translated in to the local language (*Amharic*) by experts in both languages and back translated to English by another person to ensure consistency and accuracy. Data collectors were all female nurses recruited based on their previous experience such as those who had previous training on ART and HIV counseling and fluency of the local language. Moreover, training was given for five consecutive days on interview techniques, sampling and ethical issues, emphasizing the importance of safety of participants and interviewers, minimization of under reporting and maintaining confidentiality. A pre-test of the questionnaire was conducted in selected ART units which were not included in the main study. The data collection process was closely supervised by the principal investigator and a supervisor.

The baseline questionnaire included information on socio-demographic characteristics (age, sex, marital status, monthly income, emplacement, religion); HIV testing history and disclosure of HIV status; fertility intentions; current use of contraception and number of living children. The follow-up questionnaires included similar questions to that of the baseline.

Measurement/Operational definition of variables

A change in fertility intentions would have occurred if a woman reported wanting no more children at baseline and reported wanting to have more children during the 12 months follow-up visit. Similarly, a change in fertility intentions would have occurred if a woman reported wanting more children at baseline and then reported wanting no more children, undecided or adopting a birth control method at follow-up visits. Whereas, no change in fertility intentions if a woman reported wanting more children at the base line and no contraceptive method use and same report at 12 months visit. Whereas, no intension at the baseline and adopting birth control and similar response at the 12 months visit.

The outcome of interest was **self reported fertility intentions** through the following question: Do you want to have child in the future? Concordant response at the baseline and 12 months after follow up were coded as no change (0) and discordant response as change in fertility intentions and coded as (1)

Analysis

The pre coded responses were double entered into Epi Info version 3.5.2 and exported to SPSS version 20 for data checking, cleaning and analysis.

We compared baseline characteristics of HAART initiated and HAART naïve women using McNamara's test for categorical variables. The McNamara's test result shows significant difference between the baseline and 12 months measurement in their fertility intentions (P-value<0.0001). Based on these all concordant (similar responses') combined together and the discordant (different) responses combined together and form another new outcome variable and computed in this study

Fertility intention is presented using descriptive statistics. The strength of association between change in fertility intentions and potential socio-demographic, reproductive health and clinical factors were assessed using odds ratios with 95% confidence levels. Logistic regression analysis was done to assess the relative effect of independent variables and fertility intentions and adjusted result is presented.

Ethical considerations

The research was approved for scientific and ethical integrity by the Institutional Review Board (IRB) of College of Health Sciences, Addis Ababa University. Written permission was obtained from health bureau of the Addis Ababa city government. Consent was obtained from medical directors and respective unit heads at each health institutions. Verbal consent was also obtained from individual clients. In order to make informed decision sufficient information was given to each participant. Confidentiality was strictly maintained for each piece of information and the interview was conducted in strict private place. At the end of the interview general information, referral and follow up linkages were made for those who need.

Results

At the baseline a total of 407 clients were interviewed. After 12 months 360 of the 407 were participated in the study. Forty seven clients were not included in the study due to the reasons depicted in (Table 1)

Table 1: Reasons for not to participate in the study, Addis Ababa, Ethiopia, 2014

Reasons for not participated in the study	Number
Lost to follow up	6
Died before the study finishes	2
HAART naïve clients started ART after the study commenced	7
Not volunteer to participate in the study	10
Not from the study site	3
Excluded due to only one visit during monitoring period	3
critically ill during data collection	3
Transferred out	5
Older than 49 years	8
Total	47

Socio-demographic characteristics of the study subjects

At the baseline one hundred eight (30%) and 100(28%) were within the age range of 30-34 and 25-29 years respectively. The mean age of women was 31(±5.5SD). HAART naïve women had more living children with mean of 1.4 (±1.3SD) as compared to HAART initiated women with 1.2 (±1.2 SD) numbers of children.

The predominant ethnic group and religion were Amhara (58.5%) and Orthodox Christians (85%), respectively. One hundred and forty one (39%) clients had completed grade 1-8, 202(56%) participants were economically dependent or getting monthly income of less than 500 Ethiopian birr(26 US dollars) and 104(29%) were unemployed. About half of the participants were married/cohabited (51%) and 84(23%) were single (Table 2).

Table 2: Socio demographic characteristics of HIV positive women in Addis Ababa, Ethiopia (n=360)

Characteristics	HAART users (n=190) No. (%)	HAART Naïve (n=170) No. (%)	Total
Age			
18-24 years	22(11.6)	16(9.4)	38(11)
25-29 years	51(26.8)	49(28.8)	100(28)
30-34 years	59(31.1)	49(28.8)	108(30)
35-39 years	47(24.7)	46(27.1)	93(26)
40-49 years	11(5.8)	10(5.9)	21(6)
Mean age(±SD)	**31(±5.6SD)**	**31.2(±5.47SD)**	**31.1(±5.54)**
Ethnicity			
Amhara	112(58.9)	95(55.9)	207(58)
Oromo	39(20.5)	52(30.6)	91(25)
Guragea	21(11.1)	13(7.6)	34(9)
Tigrea	11(5.8)	8(4.7)	19(5)
Others(selte,hadya,sidama)	7(3.7)	2(1.2)	9(3)
Religion			
Orthodox Christian	159(83.7)	144(84.7)	303(85)
Muslim	19(10)	14(8.2)	33(9)
Protestants	12(6.3)	12(7.1)	24(7)
Education			
Illiterate/informal education	39(21)	39(23)	78(22%)
Grade 1-8completed	70(36.8)	71(41.8)	141(39)
Grade 9-12 completed	70(36.8)	47(27.6)	117(33)
Grade 12 and above	11(5.8)	13(7.6)	24(7)
Monthly income in Birr*			
No income(dependent)/<500	185(57.8)	17(42.5)	202(56)
Birr 501-1000(501-3000)	129(40.0)	19(47.5)	147(41)
Birr above 3000(above 3000)	7(2.20	4(10.0)	11(3)
Occupation			
Unemployed	58(31)	46(27)	104(29)
Housewife	31(16)	24(14)	55(15)
Daily laborer	21(11)	22(13)	43(12)
Merchant	18(10)	8(8)	26(7)
Government employee	12(6)	19(11)	31(9)
private businesses	50(26)	51(30)	101(28)
Marital Status			
Single	49(25.8)	35(20.6)	84(23)
Married/cohabited	92(48.4)	92(54.3)	184(51)
Divorced/widowed	49(25.8)	43(25.3)	83(26

**1USD=19.20ETB*

Reproductive, clinical and fertility intensions of HIV positive women (base line versus 12 months follow up)

About, 41% (147/360) participants reported fertility intentions at the baseline, while 48.3% (174/360) reported fertility intentions at time two (12 months after follow up). At the baseline 42.1 %(80/190) of HAART initiated women and 39.4% (67/170) of HAART naïve women reported the need of more children. After 12 months of follow-up, the proportion of need for more children raised to (55.8%, n=106/190) among HAART initiated and (40%, n=68/170) among HAART naïve women. As compared to baseline respondents reported the need of higher number of children after 12 months (Table 3).

Of the 147 women who reported the need of children at the baseline, 46(31.1%) said to have within 12 months and majority 52(35.1 %) did not yet decided the time when to have children rather reported that depend on "God will or I do not know." Whereas during the second visit of the 174 women 67(38.5%) and 36(20.7% reported that want to have children within 12 months and after 24 months respectively. Sixty (35.1%) did not say on the time to have children. About 82.3 %(121/147) and 83.3 %(145(174) reported to have two or more children in the future at the baseline and 12 months after follow up, respectively.

The proportion of contraceptive use was decreased from 194(53.9%) at the baseline to 174(48.3%) 12 months after follow up. Only 6.7% (n=13) and (8.6% (n=14) reported dual contraceptive use at the base line and 12 months after follow up, respectively (Table 3).

Table 3: Reproductive, clinical and fertility intentions of HIV positive women (baseline versus 12 months after follow up) in Addis Ababa, Ethiopia (n=360)

	Baseline			12 months		
Description	**HAART imitated (n=190) No. (%)**	**HHART naïve (n= 170) No. (%)**	**Total**	HAART users (n=190) **No. (%)**	HHART naïve (n=170) **No. (%)**	**Total No. (%)**
Number of living children						
0	66(34.7)	48(28.2)	114(31.7)	66(34.7)	48(28.2)	114(31.7)
1	50(26.3)	52(30.6)	102(28.3)	50(26.3)	52(30.6)	102(28.3)
2+	74(38.9)	70(41.2)	144(40.0)	74(38.9)	70(41.2)	144(40)
Need to have more children						
Yes	80(42.1)/52	67(39.4)	147(41)	106(55.8)	68(40)	174(48)
No	110(57.9)	103(60.6)	213(59.7)	84(44.2)	102(60)	186(51.7)
number of children needed			147			174
1	13(16.2)	13(19.4)	26(17.7)	16(15.1)	13(19.1)	29(16.7)
2	50(62.5)	45(67.2)	95(64.6)	68(64.2)	46(67.6)	114(65.5)
3+	17(21.2)	9(13.4)	26(17.7)	22(20.8)	9(13.2)	31(17.6)
Time to have more children						174
Within 12 months	24(29.6)	22(32.8)	46(31.1)	41(38.7)	26(38.2)	67(38.5)
After 24 months	14(17.3)	26(38.8)	39(27)	13(12.3)	23(33.8)	36(20.7)
After 36 months	5(6.2)	5(7.5)	10(6.8)	6(5.7)	4(5.9)	11(35.1)
Undecided(do not know and God knows	38(46.9)	14(20.9)	52(35.1)	46(43.4)	15(22.1)	60(35.1)
Contraceptive use						
Yes	87(45.8)	107(62.9)	194(53.9)	70(36.8)	104(61.2)	174(48.3)
No	103(54.2)	63(37.1)	166(46.1)	120(63.2)	66(38.8)	186(51.7)
Type of contraceptives						
Hormonal	43(49.4)	61(57.8)	104(54.1)	33(47.1)	56(54.3)	90(51.4)
Condom	40(46.5)	37(34.4)	77(39.3)	32(45.7)	39(37.1)	71(40.6)
Dual protect	4(44.6)	9(8.3)	13(6.6)	5(7.1)	9(8.6)	14(8)
Who influence you (n=107)						
My family	37(68.5)	33(62.3)	70(65.4)	34(64.2)	31(60.8)	65(62.5)
His family	17(31.5)	20(37.70	37(34.6)	19(35.8)	20(38.5)	39(37.5)
Husband tested(n=184)						
Yes	62(67.4)	82(89.1)	144(78.3)	67(72.8)	82(89.1)	149(81)
no	30(32.6)	10(10.9)	40(21.7)	25(27.2)	10(10.9)	35(19)
Test result(n=149)						
Positive	45(72.6)	60(73.2)	105(72.9)	51(76.1)	60(74.5)	111(74.5)
negative	17(27.4)	22(26.8)	39(27.1)	16(23.9)	22(26.8)	38(25.5)
Disclosed HIV status (184)						
Yes	49(53.3)	57(53.8)	106(57.6)	57(62)	62(67.4)	119(64.7)
no	43(46.7)	35(38)	78(42.4)	35(38)	30(32.6)	65(35.3)

Predictors of change in fertility intentions

Adjusted analysis indicated that change from wanting no more children at baseline to wanting more children 12 months after follow up was significantly associated with woman's HAART initiation (AOR, 2.46, 95% CI 1.20-5.20), marital status: single (AOR,5.32, 95%CI, 1.10-25.92), married(AOR, 6.34 95%CI 1.43-27.99) respectively more likely to report fertility intention than divorced/ widowed women. The number of living children women have: one (AOR, 0.32, 95%CI, 0.13-0.85) two and above (AOR, 0.36, 95% CI 0.15-0.91) respectively were less likely to report change in fertility intentions in comparison to women without children. Family influence (AOR, 3.7; 95%CI, (2.20-6.20), disclosure of HIV status to husband (AOR, 1.95 95%CI 1.10-3.60), housewife by occupation (AOR, 3.60, 95%CI, 1.16-10.91) were predictors of change in fertility intentions. Whereas educational status, monthly income, partners' desire to have children (AOR, 2.10, 95%CI, 0.83-5.01) and test result of partners (AOR, 0.64; 95% CI, 0.22-1.86) has no association with change in fertility intentions of women living with HIV (*Table 4*).

Table 4: Adjusted logistic regression analysis of change in fertility intentions among HIV positive women after 12 months follow up, Addis Ababa, Ethiopia (n=360)

Variables	Change in fertility intentions		AOR
	Yes (n=41) Number (%)	No(n=319) Number (%)	Adjusted odds ratio with 95% CI
HAART use			
HAART naïve	11(26.8)	159(49.8)	1.00
HAART initiated	30(73.2)	160(50.2)	**2.47(1.20-5.20)****
Marital status			
Widowed/div	3(7.3)	89(27.9)	1.00
Single	13(31.7)	71(22.3)	**5.33(1.10-25.92)***
Married	25(61)	159(49.8)	**6.35(1.44-27.99)***
occupation			
dependent	6(14.6)	98(30.7)	1.00
housewife	13(31.7)	42(13.2)	**3.60(1.16-10.91)***
daily laborer	3(7.3)	40(12.5)	1.10(0.245-4.80)
merchant	6(14.6)	20(6.3)	2.40(0.52-10.81)
government employee	3(7.3)	28(8.8)	1.30(0.26-6.61)
private business	10(24.4)	91(28.5)	1.22(0.36-4.20)
Monthly income			
no income to below 500 birr	18(43.9)	184(57.7)	1.00
birr 501-3000	19(46.3)	128(40.1)	1.41(0.57-3.46)
birr 3001 and above	4(9.8)	7(2.2)	3.49(0.70-17.70)
Educational status			
illiterate/informal education	9(21.7)	69(21.6)	1.00
primary education 1-8 completed	18(43.9)	123(38.6)	0.96(0.40-2.44)
Secondary education 9-12 completed	11(26.8)	106(33.2)	0.78(0.27-2.26)
Tertiary education diploma and above	3(7.3)	21(6.6)	1.10(0.22-5.10)
Number of Living children			
O	22(53.7)	92(28.8)	1.00
1	9(22)	93(29.2)	**0.33(0.13-0.85)***
2+	10(22.4)	134(42)	**0.36(0.15-0.91)***
Family influence (n=360)			
no	24(58.5)	232(72.7)	1.00
Yes	17(41.5)	87(24.3)	**3.67(2.16-6.22)****
Disclosed HIV to partner (n=184)			
no	3(12)	62(39)	1.00
Yes	22(88)	97(61)	**1.96(1.10-3.60)***
Partner wants to have children (n=184)			
no	8(32)	78(49.1)	1.00
Yes	17(68)	81(50.9)	2.1(0.83-5.01)
Partner tested (n=184)			
No	7(28)	28(17.6)	1.00
Yes	18(72)	131(82.4)	0.55(0.21-1.44)
Test result of partner(n=149)			
Negative	6(33.2)	32(24.4)	1.00
Positive	12(66.7)	99(75.6)	**0.64(0.22-1.86)**

**P value <0.001 *P value<0.05

Reasons for fertility intentions of HIV positive women

Out of 360 participants, (41.7, n=147) versus (48.3%, n=174) reported fertility intentions at the base line and 12 months respectively. Reasons for positive fertility intentions for a child were related to medical concern, socially and culturally oriented, as shown in (Table 5). The most common reasons given for wanting child at baseline and at 12 months follow-up, respectively, were related to presence of ART (71%,n=104) versus 94(54%,n=94), followed by improvement of health condition (7%) versus (28%,n=48), and children are important part of marriage(8%,n=11) versus (6%.n=11). A small percentage (5%; n= 7 at baseline and 3.0%, n= 5 at 12 month of follow-up) thought that it was just due to recent marriage; by influence of husband (4%, n=6) versus (3%, n=5) respectively and some were concerned replace themselves.

Table 5: Reasons for wanting to have children in the future (before and after) (n=174)

Reasons for wanting to have children	Baseline (n=147) Number (%)	12 months after follow up (n=174) Number (%)
Presence of ART	104(7%)	94(54%)
Health condition improved	10(7)	48(28%)
Recent marriage	7(5%)	5(3%)
Husband insisted me	6(4%)	5(3%)
Health workers advice	2(1%)	4(2%)
To replace myself / Original desire for childbearing unchanged by HIV	5(3%)	5(3%)
Current child needs siblings/do not want to leave my child being alone	2(1%)	2(1%)
I like children(children are important part of marriage, either for present or future marriage	11(8%)	11(6%)

DISCUSSION

In this study we assessed change in fertility intention on the time of HAART initiation and when HIV positives linked to ART site and 12 months after follow up and factors associated with fertility intentions. Our finding from the two round analysis indicated change in the proportion of fertility intentions of HIV positive women from 41% at the base line to 48.3% after 12 months follow up. The finding is similar to what other studies have found in sub-Saharan Africa (8, 30, 31). However, they contrast with recent cross sectional study in South Africa(20) which may be resulted from difference in the study design .

There is no argument that childbearing is as important to PLWH as non infected counter parts(32). African social and cultural values dictate that having children is a key to the identity social status of women and men, including for PLWH. Similarly our finding documented that majority of women reported children are important part of marriage. It was also indicated that child bearing helps to secure marriage and linage continuity and many families often recommended that. These findings are also substantiated by previous study that women on ART quickly became pregnant even before their CD4 counts were improved because they do not only want to fulfill their womanhood roles but also to prove that they were healthy (23).

HAART use together with other factors became significant predictors of fertility intentions among HIV positive women in the study area, where total fertility rate is 2.4 children per reproductive aged women in Addis Ababa (4). HAART users compared to HAART naives were more likely to change fertility intentions from wanting no more children at the base line to wanting more children 12 months after ART initiation. The effect is statistically significant after controlling potential confounders of fertility such as number of living children women have, age, income and socio-demographic conditions. Furthermore, it was identified that change in fertility intentions associated with the number of living children women have, marital status. This is similar to previous reports from sub Saharan Africa (31).

In compression to the base line the contraceptive use of women has decreased 12 months after follow up and relatively majority of the study subjects reported hormonal contraceptive use in

both scenarios which is effective in preventing unintended pregnancy. However, low proportion of dual methods use (6.6%; n= 13) versus 8%; n=14) was reported at the base line and 12 months after follow up, respectively. The finding is similar with finding reported (15%) from sub Saharan Africa (22). While the use of dual contraceptive methods (condom with other methods) is safe to prevent unintended pregnancy and HIV (33, 34). Our findings reinforce results from other studies; low use of dual contraceptive method resulted from this indicates the presence of low acceptance of condom use in sub-Saharan Africa due to socio-cultural influences and insufficient information (35). The study population might be at risk of acquiring sexually transmitted infection including drug resistant HIV virus.

It was identified that change from no more children at the base line to wanting more children is more likely to occur soon after ART initiation among HIV positive women. Thus family planning should be an immediate priority for providers and discussed regardless of HAART initiation and satisfy safe fertility and contraceptive preference of women living with HIV in the area.

STRENGTH AND LIMITATIONS

As strength the study tracking a cohort of both HAART users and HAART naïve women for over a year and indicated that fertility intentions were not static. A potential limitation of this study is relatively short duration of follow up (12 months), we did not follow a cohort of HIV negative women, our interview was limited only on two points and limited only public health facilities. It is also potentially subjected social desirability bias as the study outcome is self-reported fertility intentions. Women may have become more aware by second round after 12 months fertility intentions increase is expected and there for, they may have over reported it. To minimize these interviewers were not the same people who provide ART and other care and support service. Moreover, adequate training was given to data collectors and supervisors. It was also strictly supervised amid to reduce bias.

HAART use is significant predictor of change in fertility intentions and suggests that additional effort is necessary to avail integrated family planning, fertility and HIV services to address safe fertility goal of women living with HIV in the study area.

In conclusion, we found evidence of change in fertility intentions among HIV positive women 12 months after ART initiation. HAART use is significant predictor of change in fertility intentions of women. Furthermore, considerable proportion of women still does not consistently use dual contraceptive and remain a cause for concern.

Overall, finding from this study calls to design target oriented interventions to promote safer fertility practices for those who wants to have future children and establish family planning counseling along with HIV services. Finally, Future research should investigate the potential influence of HAART on incidence of pregnancy and change in preventive practices with the involvement of partner.

Competing interests

We declare that no financial or non-financial competing interests related to this study.

Authors' contributions

Both authors contributed equally during design and conduct of the study. HM and FE participated in data collection, statistical analysis and interpretation of findings. HM prepared the draft then FE revised the draft of the paper. All authors read and approved the final content of the manuscript.

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PAPER IV

Fertility and contraceptive decision-making among women living with HIV in Addis Ababa, Ethiopia: a qualitative study

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ABSTRACT

Background: in the light of antiretroviral therapy (ART) people living with HIV want to have children as well as prevent unwanted pregnancies, these heralds on the needs to consider safe fertility and preventive services to positive women along with existed comprehensive care. This study aimed to assess fertility and contraceptive decision-making and support for women living with HIV from the experience and perceptions of clients and providers at different public health hospitals and health centers in Addis Ababa, Ethiopia.

Methods: We conducted focus group discussion and in-depth interviews with sexually active HIV positive women and key informants interview with health care providers. Overall, 53 individuals were involved; including 36 clients through focus group discussions, 10 in-depth interviewees and 7 key informant interviewees from providers. Qualitative thematic content analysis was used. The discussion was guided by key study questions. Open code software was used to group into themes then categories and codes were identified.

Result: Majority of participants had wide range of contraceptive preference; while few participants indicated that they did not like to use. Perceived stigma, accompanied side effects; men resistance to cooperate on the use of condom and family influence on women were the main reasons for not to use. The common reason for women to have children was resulted from family influence, partner desire and community perception being childless is taboo and considered as women's responsibility. Many participants indicated that providers are supportive in offering

information but restricted to preventive methods using condom. Whereas not eager to discuss fertility and family planning options due to wide range of misconception.

Conclusions: the finding indicated the need to integrate safer fertility counseling and contraceptive options to women living with HIV along with routine HIV care and support in the study area and beyond.

***Key words*:** fertility desire, contraceptive decision making, women, qualitative methods, Addis Ababa.

Introduction

Sub-Saharan Africa is the region most severely affected by HIV[1]. Women of reproductive age account for 58% of the people living with HIV [2] and 53% of all adult deaths [3]. In Ethiopia, more women (2.9%) than men (1.9%) are living with HIV [4]. Most of these women are particularly vulnerable to HIV due to complex burden they have including physiological, social vulnerability and gender inequalities [3, 5]. Since infected women are of childbearing age [4], they risk infecting their children and thus face difficult choices about childbearing.

However, with access to highly active antiretroviral therapy (HAART) and preventive care people living with HIV are better able to consider childbearing and parenthood [6] as compared to early days. Earlier studies involving women on ART have revealed that most of pregnancies among positive women might be intentional [7-9]. Subsequent studies from sub-Saharan Africa reported highly active antiretroviral therapy (HAART) access has an influence on fertility of HIV positive women [10-12] and many PLWH have strong desires for biological children [8, 13], also majority of them intended to have more than two children [8,13], which entail unprotected-sexual intercourse. The desire of having children in the future has significant implication for the transmission of HIV to sexual partner and new-born [12].

Furthermore, qualitative studies from South Africa and Zimbabwe noted that the availability of ART and prevention of perinatal HIV transmission have also positively affected childbearing desires [13, 14]. Prevention of unintended pregnancy among HIV positive women through

family planning is the second element in a comprehensive prevention of mother to child transmission of HIV (PMTCT) [15], endorsed by Global health leaders [16] and has been ever going for the last decades [17]. However, largely centered on the prevention of unintended pregnancies and has not comprehensively addressed their fertility and contraceptive decisions making [18].

Previous evidences also suggested that PLWH in developing countries often do not have sufficient information about contraception and parenting options [13]. It is difficult for PLWH who attempt to have children without adequate information and support as it can increase risk of HIV transmission and unintended pregnancies. Furthermore, health workers are comprehensive care providers who are expected to satisfy the need of women who wants to have children and wish to prevent pregnancies[19], but the existed situation does not go with the current need of women due to various reasons such as widespread misconception about safety of contraceptives, providers attitude, stigma, family and community perception towards childbearing [10, 20].

Ethiopia has been striving to avail ART to women living with HIV, there is a need to augment the existed care and support activities undergoing in Ethiopia boosted with contextual findings. Thus, this study attempts to explore contextual factors that explain the situations and circumstances in which women make decisions about their fertility and contraceptive preference and the support available as well as perception and experience of providers in choosing the fertility and contraceptive preference of women living with HIV in Addis Ababa.

Methodology

Study setting

The study was conducted in health facilities of Addis Ababa, Ethiopia. Fee based, antiretroviral treatment began in 2003 and free ART was launched in 2005 [21]. Since then, a total of five public hospitals and twenty five health centers have been offering ART [22]. About 124,983 people living with HIV were enrolled of whom 76,035 have ever started and 54,667 are currently on ART in the city [4]. The Addis Ababa community has fertility rate of 2.4 per reproductive aged women [4]

Design and sampling procedures

The qualitative data collection methods such as focus group discussion, in-depth interview and key informant interview was conducted between Octobers and December, 2013.

Study population

The study population was selected purposively. All HIV positive women receiving care at the ART sites aged 18-49 years, reported having sexual relationship 12 months prior to the data collection, and women living with HIV serving as mother support group and adherence supporters were participated. Health care providers were physicians, health officers and nurses directly involved in care and support activities for women living HIV at each hospital and health centers.

Data collection

Focus group discussions (FGDs) were conducted to obtain broader views and experience and perceptions of women concerning fertility, contraceptive preference. Then with the mirror of big picture from FGDs; in-depth interviews (IDIs) were conducted with HIV positive women to explore individual's life experiences and perception about fertility, contraceptive. The sample size was determined on the basis of theoretical saturation (the point in data collection when new data no longer bring additional insights to the research questions).

The participants were selected purposively and potential participants were identified at the time of clinic visit. by using screening tool to assess for eligibility for age (18-49 years), sexually active, enrolled in the care and support activities of the site).The potential participants were invited to a private room and clinic providers were introduced with the study interviewer, who provides a brief description of the study. Interested clients were received and completed participation information. The discussions were facilitated by the two expreienced moderators(Msc Nurses) together with principal investigator.Aassistants were involved to capture non verbal cues and other non recordable issues. The participants' line was not affected during the discussion

Data collection tools

Semi structured interview guide for focus group discussion, in depth interview and key informant interview was developed in English and translated in to Amharic by experts' who are fluent in both languages and back translated to Amharic to cheek its consistency. Important concepts and points for development of the questionnaire was derived from published articles [14, 23] and adapted to the local context tools were prepared by considering the culture, values and language of the study subjects.

Data processing and analysis

All discussions were tape-recorded and a note taker was present in all discussions. It was transcribed verbatim in to the language of discussion, Amharic. The transcribed text was given to three of FGD, two IDI and two KII participants to read and check weather all points were properly captured or not. The checked texts were translated to English and back translated to Amharic to see its consistency. The initial step in the analysis was to read through all the transcripts several times while making notes in the transcript. The notes were reviewed by multiple readers and themes identified and coded, to ensure that all the key themes were captured. The research assistants and investigators used an empirical approach to modify the pre-determined themes. After verifying and reviewing the coded and labeled responses, the authors identified major themes

The English version of the data entered in to an open code software version 3.4 for analysis and the codes were grouped into categories in order for themes to be identified [24] Codes were grouped into categories. Then the themes and subthemes further identified. This was intended to indentify similarities as well as differences in experiences and opinions across various categories of participants (women, providers, at different health institutions). Further key questions were put in to memos during coding, letter they used to incorporate to illustrate the main ideas during the write up. Quotes and important points presented by the participants were presented along with the qualitative data to give emphasis of the concepts. Qualitative latent content analysis technique was used. The data were therefore condensed without losing quality (*Figure 1*)

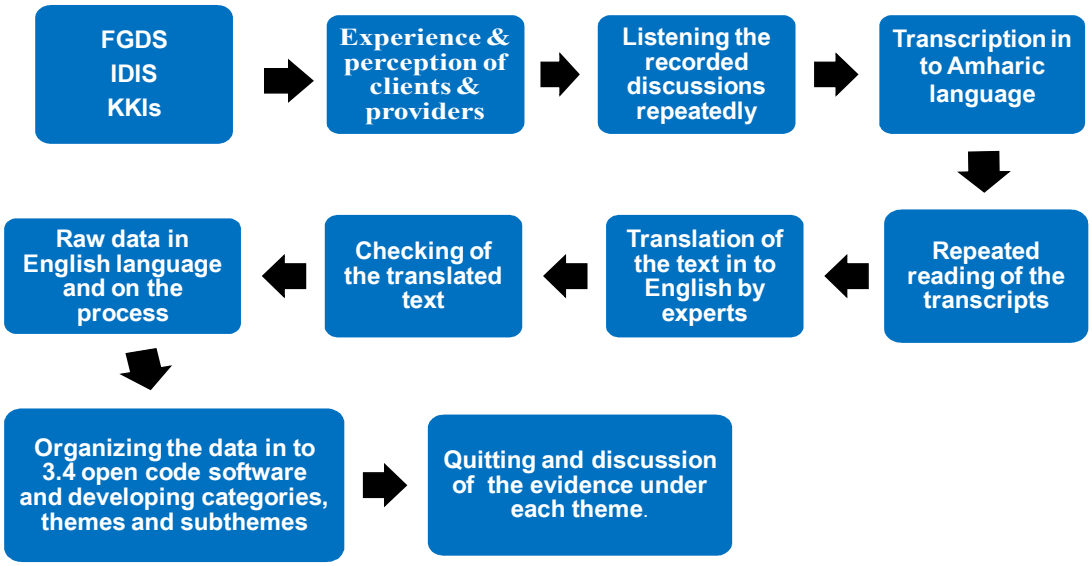


Figure 1: Schematic presentation of data processing of the study, Addis Ababa, Ethiopia.

Ethical considerations

Ethical clearance was obtained from Institution review board (IRB) of college of Health Sciences; Addis Ababa University. Written permission was obtained from Addis Ababa city administration health bureau. Consent was obtained from chief executive officers, medical directors, case teams and/or matrons and head nurses. Verbal consent was obtained from individual clients. Interviews were conducted in a private, quiet, ventilated, lighted room to respect the study participants' anonymity and boost their confidence on the study. Each piece of information that was obtained from every responding subject was handled under strictly confidential care, locked in separate locker handled by the principal investigator. During discussion the name of participants was not indicated, rather codes were given for each discussant's and the cod was employed for transcription.

At the end of each interview session study participants were provided with general information on the means of improving their contraceptives and condom demonstration was done if the need arises. The study did not cause harm neither to the data collectors nor study subjects. As it was arranged with their usual follow up period no compensation was given to all participants.

Data quality assurance mechanism

A randomly selected transcripts and translates were compared with the original records by experts to verify the accuracy. Involvement of multidisciplinary research team, the data collection tools were prepared by considering the culture, values and language of the study subjects. Ethical clearance was optioned throughout the process. Verbatim transcriptions and content analytical procedures were used to make the study rigorous. The tape record was supported by field note to cross check the information. Transferability was enhanced by using purposive sampling in selecting the discussants. Independent coders were used to ensure the conformability of the information and differences were solved through consensus. Detailed literature search was used to support the description of findings and controlled. Credibility was assured by follow-up interviews with participants and member checking [25]

RESULTS

A total of 53 participants were involved in the study, including 36 through FGDs, 10 IDI and 7 key informant interviews. The 36 FGDs participant included women age 18-49, adherence supporters and mother support groups. On average 9 participants were involved in each FGD with minimum 8 maximum 12 participants. A total of 10 IDI participants were positive women. The health care providers interviewed include (6 nurses and 1 health officer). The number and category of interviews conducted are summarized in (Table 1)

***Table 1*: Socio demographic characteristic of the participants by category, Addis Ababa, 2013**

Categories	Age	FGDs*	IDIs#	KIIs**	All
Positive women	18-24 years	17	4	-	21
Positive women	25-45 years	19	6	-	25
Providers		-	-	07	07
Total response		36	10	07	53

*Key: *Focus group discussions, #in depth interviews, **Key informant interviews*

The experience and perception of clients and their providers on fertility and contraceptive decision making and available support in ART sites from clients and providers view points, are presented, (Table 2). Three main themes were identified and are described by categories and codes. **Theme I** deals about **preferred contraceptives** which are subcategorized in to type of contraceptives, factors affecting on the choice of contraceptives, dual contraceptive methods, condom use and associated challenges (fear of disclosure, resistance men vs. women themselves). **Theme II** discusses on **fertility desire** that comprises factors affecting decision to have children such as presence of ART, women's desire, partner desire and family influence. T**heme III focuses on s**upport of health care providers and health workers voice that highlights attitude of clients about existing support and health workers perception and experience about fertility and contraceptive options to women living with HIV.

All participants across discussions reported importance of considering fertility and contraceptive options along with the existing care and support activities in the study area. It is important to better integrate family planning services in the same site as it is important in maximize fertility information and contraceptive use of women living with HIV.

Table 2: Fertility and contraceptive decision-making and support for HIV positive women: by themes, sub-categories and codes, Addis Ababa, Ethiopia, 2013.

Themes	sub-categories	codes
Theme I: Preferred contraceptives	Type of contraceptives	common condom, other methods
	Factors affecting choice of contraceptives	availability, condition of women, side effects, miss understanding, mass media, accept what is available
	Using dual contraceptive methods	ignorance, attitude, inappropriate counseling, concordant result, partner resistance
	Challenge with condom use: factors affecting fear of disclosure Resistance: men vs. women .	religious, myth, partners influence ,women's misconceptions, taboo, Lack of available methods, disclosure Resistance(men vs. women) less value to women's suggestion lack of confidence submissive, fear of unknown similar result, dissatisfaction, own perception
Theme II: Fertility desire	Factors affecting decision to have children: presence of ART on women's desire partner desire and family influence	presence of ART, to replace self, not to leave a child alone, economic problem, loss of child, community acceptance of men, fertility and women, interference of extended family, unplanned pregnancy, stigma, social security, fear of being sterile
Them III: Support of health care providers and health workers voice	Support of providers and attitude of clients(perception and experience about support)	focus on condom alone, providers knowledgeable, busy , sero-status, , no focus on fertility decisions, no support for those who want to have children
	Health workers voice/perception and experience	women needs to have a child, CD4 and clinical improvement support is not comprehensive no other contraceptives except condom, lack of awareness, no training for other methods and double contraceptives not available in ART sites forced to refer to other sites

Theme I: preferred contraceptive methods

1.1 Type of contraceptives

Majority of participants from FGD and IDI reported that the choice of contraceptive methods is based on condition of women and availability of methods within each health institution. Most of the participants reported that condom is the preferred contraceptive method over others. Furthermore, injection, implant, loop and pills were among methods listed by the participants.

1.1.1. Injections

Many participants reported that injection is the most preferred method following condom, since there is no need to remember now and then. However, refelected their concern about its problem like headache, back pain, excessive weight gain, irregularity of menstruation, mood change and sterility after taking it for a long period of time.

> *"I know women who became sterile after taking injections for a long time that is the main problem with family planning."* (38 years old HIV positive woman)
>
> *"…even I do not like to see my husband; such behavioral changes are often seen after I have started taking injection* (34 years positive woman)
>
> *"…. my neighbor has been taking injections, but she has gained considerable weight"* (35 years positive woman)

On the other hand, those women who had living children preferred injection for its long term amenorrhea.

> *"I had enough number of children and have been using injection every three months. I liked it because it stopped menstruation and I was happy with it as it does not require remembering."* (37 years old woman with 2 living children)

1.1.2. Loop

Many participants preferred loop as it has no side effect like that of injection, no need to have surgery and it is possible to remove it when a woman want to have children. Participants reported that preference of loop was due to the current advertisement by mass media especially, the Ethiopian Television. However, some had concerns of exposing their privet part of the body and worry that loop can go to internal parts of the body, deep in to the abdomen, may also go to the brain or can be displaced to unknown places and consequently may cause a long term problem.

> *"… it can go to the internal part of the body and shall be difficult for a woman working hard as it can cause back pain"* (36 years old ART naïve woman). *Another participant also reported that "for women who work hard, it is difficult to tolerate loops, but for*

women who have light work or do not have at all might be good." (35 years old woman on ART)

1.1.3. Implants

Most participants reported that they prefer to use implant and have experience of using it, since there is no need of remembering, like that of pills and can be used for a long period of time but most providers are not comfortable for such options as it takes long procedures in comprision to injection. Some participants also reported that *"It is difficult for women carrying heavy objects as it causes pain on the shoulder.*" It was also reported that implants need surgery which causes pain. Few of them also do not want to use implant at all, due to *"concern of dying with foreign body (or implant inside the body)."*

> *"I have implant now, but the nurses promised me to remove if I die, since religiously it is not accepted for someone to be buried with foreign body*."(36 years old HIV positive woman)

All participants are well aware of the presence of permanent contraceptive methods such as tubal ligation and vasectomy, but had concerns about their irreversibility and acceptability religiously or culturally.

> *A participant enquired "after God has created us fully why we go for distraction?" she asked, 'what will happen if a woman pushed by husband?' No one will marry her again, so fertility is security for woman's existence in our community"* (31 years old HIV woman)

1.1.4. Oral Contraceptive Pills

Pills are methods rarely selected in compraision to injection, condom and implant. It is easy to forget, it irritates stomach it cannot be taken without having food.

> *"When someone takes tablet, one has to eat food if not taking tablet for a long time may be harmful."* (40 years old HIV positive womanon ART); another *participant reported that pills can be accumulated in the stomach and form some form of swelling in the stomach which leads to long term problem."* (32 year's old ART naïve woman)

> *"… I personally do not like any tablet even I used to crash the tablet in to pieces before I take it God knows what will happen when I start ART."* (39 years old HAART naïve woman)

1.2. Dual contraceptive methods

Majority of the participants from FGD and IDIs reported that their knowledge and practice of contraceptive methods were limited to condom, rarely, implant, loop and injectables. Few participants reported the use of additional methods together with condom. They also said that they lack confidence to use additional methods mostly due to lack of knowledge on the need of additional methods and fear of side effects when taken with ART. Most of the participants addressed that they lack clear information except condom use especially from health care providers.

> *"… I think the information we get about dual use of contraceptive methods is not complete this is due to inadequate counseling by health care providers…" (*28 years old ART naïve woman)

1.3. Male condom

Participants reported that condom is the preferred method and most participants agreed that women should negotiate for male condom to prevent drug resistant virus and prevent other sexually transmitted infections. Furthermore, condom is important for couples to prevent unplanned pregnancy and sexually transmitted infections *and is "the method women easily get from ART sites, while coming for follow up."*

1.3.1. Factors affecting condom use

Using condom has challenges, the most common being myths attached with such as "*condom brings HIV itself*" condom can lead person "*to promiscuous*" and "loss of trust between couples". The other challenge is economic dependency of women, misconception of couples and resistance

of men, lack of decision making, taboo talking sex and sexuality, especially from a woman side. Women are unable to talk freely and do not try to convince their husbands to use condom.

1.3.2. Fear of disclosure

Most participants reported that women are the first to know their sero-status, usually screened at antenatal follow up or for other health problems and they are the first to face challenges in disclosing HIV status and dealing with condom use issue. It is not easy for dependent women to overcome such a problem. Most of the participants said that *"When a husband became HIV positive the wife usually, accepts using condom, but the problem is serious when their sero-status becomes different."* It is also a challenge for those women living being discordant which end up in lack of confidence, violence and divorce.

1.3.3. Men resistance

Most of the participants reported that men are not comfortable using condom and do not want to discuss it anymore. Men usually resist using condom because of lack of sensation, failure to have erecting and feel as if "*eating a banana without "peeling*" and wide range of misconceptions about it.

> *"Some men want to relate condom as if it contradicts to their belief as "God do not allow sex with covered organ.*"(32 years old HIV positive women)
>
> *"If I ask my husband to use condom he may not trust me or my complain not to use, usually when husbands are requested to use condom the first thing they raise is "you do not have trust on me "you are cheating on me and that is why you request me to use condom' where do you get this?' and the likes are common reasons for their resistances."* (34 years old HIV positive woman on ART*)*
>
> *"I have never used condom because when I asked my husband to use it he was not willing as a result I was forced to to use other pregnancy prevention methods, like pills "* (37 years old HIV positive woman)
>
> *"I asked my husband to use condom but rather asked me 'what change to bring, once we become positive?' 'Why do you bother and what comes after all?' I could not convince him and still we have sexual intercourse without condom. I am on ART and my husband*

is positive, but did not start ART." (30 years old HIV positive woman on ART with husband who did not start)

Conversely, women have unknown fears like if a woman resists to have sex with her husband without condom she feels that he might go to other woman and the consequence might be worsen, so women themselves, accepted the issue as if their responsibility is to satisfy their husbands request.

"A Woman should use condom if her husband is willing to use, if he resists, she do nothing because it is woman's responsibility to satisfy her husband otherwise he will go to other places." (37 years old woman with HIV positive husband)

Men also resist using condom when they buy sex from commercial sex workers (CSWs) after they take alcohol. In case a CSW asked to use condom, then she gets less payment in comparison to those who are willing to do without condom.

"… I am ready to use condom if men are willing but most of my clients are not willing to use rather they pay me more money , I usually be flexible and use without condom due to fear of losing my clients."(36 years old HIV positive CSW on ART)

Most of the participants reported, that it was men who decide not to use condom without respecting women's suggestions as they are bread winner and physically strong as well as accepted by the community. The issue is challenging even to women who have relatively better awareness about condom use and working as mother support group and adherence supporters at different health institutions.

"*I usually tell my friends to use condom, but lost my confidence since I am not using condom due to my husband's resistance*." (30 years old woman working as mother support group and living with positive husband)

*"I could not use a condom because when I told my husband to do so, he shouts at me and warned me that will go to the extent of separation." (*36 years old woman working as peer educator)

"We were married after both my husband and I became HIV positive and when asked him to use condom he usually says" both of us are positive why do you force me to use condom? "Do you have doubt on me?" when I asked him repeatedly one day he said "the reason I married a positive woman is not to lose my freedom" From that on I

stopped asking him due to fear of the consequence (31 years old positive woman living with positive husband on ART working as peer educator)

1.3.4. Women's resistance

On the other hand, the problem of resistance against condom use is not only limited to men but also there are women who are not willing to use condom. Majority of the participants reported that many HIV positive women are living with HIV negative and or HAART naïve husband but not using condom properly. They reported that couples are doing mistake as a result of ignorance, resistance and ART complacence. Moreover, many people are failed to use condom as result of being positive, participants across the group indicted that when both partners become positive and stay with the infection they failed to adhere on condom use, rather want to associate means of trust and love.

"As far as we trust each other, why we worry about condom after being positive?"(41 years old HIV positive woman on ART living with husband on ART)

"I do not use condom because it dissatisfies me." (38 years old positive woman living with HIV negative husband)

"*I have met a new partner quite recently but I have not discussed my ser status. I am not ready to tell him about my sero-status. Obviously, it is difficult for me to raise condom issues at this time before disclosure and I heard while he complains that 'condom makes me lose interest in sex'. "* (23 years old woman on ART living with unknown sero-status boy friend)

Some women are secret to tell their status because of their own reasons. As women keep secret it is difficult for them to stop or plan child bearing.

"*I myself not comfortable to use condom and at any cost I need it in naked condition."* (40 years old HIV positive woman living with negative husband)

"I know my friend who had new partner after the death of her husband. She has been on ART for many years and not living with new partner, she has adequate income and children from the deceased husband but she did not tell her status to the new boy friend and even do not know the status of her friend. When I ask her to tell the reality she resisted me due to fear of separation as she is in love. In general he is looking for the

available resource and she is looking for the satisfaction and nobody bothers the prevention issues at this time."(30 years old HIV positive woman)

Theme II: Decision to have children

A. Factors affecting fertility decisions:

All participants indicated that many women living with HIV intend to have children. The decision to have or not to have children is influenced by multiple factors, including presence of ART, health improvement, existed situation about PMTCT (prevention of mother to child transmissions of HIV), income, desire to replace self, social security family and partner influence.

B. Effect of ART access on fertility intentions of women

Availability of ART made possible an extended lifespan and cause HIV positive women to rethink their future children and contraceptive options. Many discussants acknowledged that ART has made "*the impossible one possible."*

> *"Before start of ART live alone to think fertility it was hard to imagine and live in this world. No one wanted to die by leaving orphaned child, but ART has changed our life."* (30 years old HIV positive woman)

> *"Starting ART is a must for a woman before she decided to have child, unless we take precautions pregnancy might come accidentally like it did on me. "For example I am not yet started ART but I got pregnant by mistake and thanks to God my child is free but I will never do the second mistake."* (25 years old HIV positive woman)

Many discussants reported thatthey have strong desire to have children. A 34 years old HIV positive women reported that because "*have seen when positive women are getting free child*" and '*No problem to have children as far as woman uses ART properly'*; another women added that 'I *have plan to have children because I get improved thanks to ART and the next issue is income that might challenge me otherwise I have plan to have children in the future.'*

Still the desire of future children was not limited to one child as most of them reported that "*not good to leave a child alone because a child will face problem as we have been facing stigma. If we get at least two they will support each other*."

> "*…I personally had free child last year and I still want to have additional child in the future because I do not want to leave my child alone."* (26 years old HIV positive woman)

Many participants suggested that "at least two children are must" even participants expressed their concern to extent of "a *person without children is Bekumu yemote new"* in Amharic means being childless is equivalent to '*person who is buried alive'."*

> "*I want to have children, they are my only gifts; I trust to leave to my family and relatives when I die*."(31 years old HIV positive woman)

While future fertility is more important among women who do not have children, it is less important among those having living children and who lost children especially as a result of HIV.

> *"Currently, I have three children they are enough for me "Enrsun shih yderegelegn" in Amharic means "I pray to god to let them be thousands"* (38 years old HIV positive woman who have children)

Conversely, women who lost their children are less interested to have children in the future as a result of bad experience she had. *"I have sad event due to a loss of a 5 years old child with HIV, currently I do not plan to have children in the future."*(34 years old HIV positive woman who lost her child*)*

However, the situation is not the same across all participants as most of the discussants reported that "*Moten mashenef yemichalew bemewlled* new" means "The only means to win "*the battle against death is by having children*"

C. Partnership influence

Majority of the participants reported that woman should accept what her husband is saying if she wants to have smooth marital relation otherwise the consequence is severe. Not only the husband but also women consider a means of existence and love to her husband

"*… For a man, who gave his life to his wife, he should get children as a reward and woman should give births, or else she cannot convince her love to him."*(32 years old HIV positive woman)

D. Family influence

There is deep routed misconception about pregnancy and women especially at early stage of marriage in our community and association of childbearing as the issue of women and accepted as a norm. Furthermore, interference of extended family and social encirclement in general predisposes women for unplanned pregnancy.

In Ethiopian community having a child is a must for a woman in order to get her position and acceptance from in-laws and the community. Majority of FGD participants reported that pressure starts during her wedding as everyone sings a common song like "yezare amete yemamush ennate" meaning "by next year she should be a mother." This has strong message for couples to have child as soon as possible. Husband's family including, neighbors whisper to him; as 32 years old woman rightly put "Bekllo new Feres *Yegezahaw*?" in Amharic means did you buy a mule or a horse? They want to represent a sterile woman to a mule and a fertile woman to a horse.

"My neighbor asked me nine months after my wedding 'why do you stay for nothing?' or 'do you have someone you are looking for?' I got pregnant without my plan, just not to be blamed" (30 years old HIV positive woman living with HIV positive husband)

"My *neighbor asked me why I do not give birth and I asked her to pray for me. She said to me unless you take contraceptives how could this happen, and she suspected that I hide contraceptives (pills) in my bedside."* (21 years old HIV positive woman living with negative partner)

Discussants from IDI addressed that for planned pregnancy and preventive practices couples' agreement is important, but couple's agreement is not sustainable as it can be affected by social norms of the community and when family and neighbors start murmur and pointing finger the couples planning is distorted

> "*I married an HIV positive husband and before our marriage we agreed not to have a child but he has changed his promise and even asked me to get pregnant sooner than my expectation?"* (30 years old HIV positive woman)

Theme III: Support of health workers for HIV positive women

A. Women's perception and experience about support from ART providers

Majority of the participants across the discussants reported that health care providers working in ART sites are comfortable in discussing about "*condom together with ART*". However, the fertility and contraceptive option including dual contraceptive method use is largely neglected. They are reluctant in advising other methods as 30 years old HIV positive woman rightly put *"I think it is not available with them*"; other participant added that "*the first and the last counseling is condom*." (29 years old HIV positive ART naïve woman); unlike ART providers those who are working in family planning units are not familiar on how to handle PLWH and difficult to choose the best methods.

> *"I have been with the virus for the last eight years, I have never heard while health workers are talking about fertility and contraceptives options, except condom. I was pregnant some five years back and health workers were shocked at me instead of supporting me, but now a lot of changes are there."* (28 years old HIV positive woman)

> "*Health workers from ART sites have condom at hand it was nice to have additional methods together with ART and it will be easy for us to communicate with them because they are the one who knows our status."* (21 years old HIV positive woman)

> "*I think it will be nice if everything available in one place, no need to worry about disclosure to other providers and it is difficult to tell about our status to everybody."* (37 years old HIV positive woman)

> *"When we go to other providers, we never know might be a person who knows us and difficult to be sure about our confidentiality in such cases, we do not trust all providers can respect our confidentiality."* (38 years old HIV positive woman)

> *"It is difficult to tell now and then about HIV to everybody and more difficult to providers who does not know on how to handle PLWH."* (34 years HIV positive woman)

When asked whether they have asked the health care providers or not: Most of them said did not ask, the common reasons was they believe that providers are knowledgeable, "*they have capacity to select the best for us.*" Many participants also reported that providers are busy and many clients are waiting outside. Few participants also reported that they have asked providers, but the only method as usual condom and recommend going to other units or health institutions to get other methods

> *"When they advise us to go to other providers we need to arrange some other time and it is difficult to get permissions from our work place, it would be nice if we get all services on the same place by the ART providers along with our follow up time*." (32 years positive woman)

> *"I asked providers about other methods and they recommended me to go to other places, actually I did not, due to fear of disclosure and feel that other providers are not familiar on how to handle positive women."* (23 years old HIV positive woman on ART)

However, few of the participants reported that the problem is from us. If we raise the question they will give us the information, but we assume that they are "*busy and difficult dealing such issues, while many clients are waiting outside.*"

The point was substantiated by health care providers who undergone Key informant interviews, three participants conformed that the emphasis is on ART and condom provision. Whereas; the fertility and contraception options are highly neglected

B. Health workers view about fertility and contraceptive decision of women living with HIV

All participants from health care providers reported that HIV positive women have a right to have children, plan family, use appropriate preventive methods and should get target oriented support. They also emphasized that as far as her CD4 cell count and clinical symptoms are

improved they have chance of getting everything they want. Furthermore, they usually advise clients to stay for a while and inform provider about their situation before they decide to get pregnant.

> *"We used to advise women not to get pregnant at early times of ART and always we used to tell about use of prevention methods especially using condom. Most of them accept as we tell them to do, but few women are requesting 'condom is not enough' but we do not solve such problem as we did for ART. This might be lack of awareness from our side and practically we know many clients become pregnant while they have been reporting condom use."* (HCW form hospital)

Many providers promote only condom to HIV positive women because no contraceptive options to select and are not confident to inform the safety about existing options. Clients are not empowered when they go to other health institutions for other options and commonly refrain from going to the recommended place.

> *"We do not have options except condom. The family planning is not available in our facility, we usually advise them to go to nearby health institutions. They usually request how to approach other providers and worry on how to tell their sero-status.* (HCW from Hospital)

> *"We recognize their concern about stigma and we usually tell them the presence of shared confidentiality." But they are not confident to discuss the issue and give the chance of selection to the providers; this resulted from lack of awareness from clients and inappropriate counseling from providers."* (HCP from hospital)

Participants reported that few clients willing to raise discussion on contraceptive options and fertility issues, but providers do not give chance to go further discussion about the advantages and disadvantages of each contraceptive method. The participants also highlighted that the problem resulted from lack of updated knowledge about each methods and counseling issues

> *"We do not have adequate knowledge on how to handle different contraceptive methods to positive women and we feel as if it is time consuming to open such topic while many clients are waiting outside*."(HCW from hospital)

Few of them also agreed that they have basic knowledge about different contraceptive methods, but they lack updated practices and counseling techniques. Majority of them also discussed that they have gap in considering the fertility and contraceptive options along with ART. This has

contributed for clients' misconception. The providers also stressed that unless providers are updated the problem will sustain being public health issue in the study area and beyond.

DISCUSSION

This study shows valuable insights in to perceptions of women living with HIV and the providers view and experience about fertility and contraceptive decision of women living with HIV and assessed prevailing situation that women living with HIV directly face while they are trying to have safer fertility and preventive practices.

It was reported that condom is the preferred method of contraceptive available in the ART sites and linked with the care and support activities specifically to positive women in the study area; which is consistent with previous report in study area. Many women are either using one contraceptive method or not using at all being on ART. Women are suffering from secrecy, powerlessness, male dominance and economic dependence. Males are not willing to us condom due to lack of sensation, discomfort, difficulty with organ erection, not important to use and failure to accept women's suggestion.

Furthermore, our finding indicated that while, the desire to have children and demand for contraceptive option among the study subjects is high, which is consistent with previous studies from Sub Saharan Africa [10, 14]. The information to those who want to have children or want to use other options is scarce, which is challenging to positive women and had wide range of misunderstanding about advantages and disadvantages of each method. This might have resulted from lack of information as it has been reported from previous studies from developing countries [13]

Women in the study area reported that with the exceptions of male condom, getting other contraceptive methods is difficult as it enquires disclosure of sero-status to other providers, time wastage and failure to relay to those who do not know their status; as a result, women failed to stick to what they want to plan. Furthermore though, contraceptives are free in public health institutions in the country, they have to pay when they want to get it from private institutions and

if the other option requires extra transport and time that maximizes the cost of contraceptives in their locality. This is similar to previous studies reported cost of contraceptives as reason that hindered them from using options [26, 27]. In considering contraceptives availability contextual socio-cultural norms, health concern and misconceptions need to be addressed.

Participants aware on importance of preventing unplanned pregnancy and sexually transmitted infections including drug resistant HIV virus and wants to have HIV free child whenever they want to have but most of them relayed on either condom alone or other separate contraceptive methods and use of dual contraceptive method (condom with other contraceptive methods) was not taken into consideration which indicates presence of information gap. The finding is consistent with previous study conducted in the northern part of Ethiopia associated with lack of knowledge, communication gap between providers and lack of condom approval [28].

The main challenges for using male condom were fears of being blamed like having multiple sexual partner, religious issues, fear of disclosure of HIV status to partner or others, resistance of husband in using condom and lack of awareness about the importance of using condom along with other contraceptive methods and lack of negotiation skills to convince husband, being abandoned as a result of economic problem which leads to social isolation and pressure from the community. Conversely women have fear of unknown like if women resist their husband sex without condom he might go to other women or the consequence might be worsen and causes violence and divorce. This in accordance with misconception of women themselves has contributed for poor adherence to condom use.

Gender inequality places women at greater risk of being infected by HIV. Women lack power over their sexual lives, the prevailing social and economic inequalities increases their vulnerability. With increased poverty and other factors women found themselves for causal relationship with men for financial gain. The problem is severe among those working as commercial sex workers.

Presence of ART has positively affected the desire of children and family planning option of the study subjects. The result is consistent to previous report from sub Saharan Africa[14, 29]. In

addition to this, the demand and reasons to have children among positive women is similar to HIV negative women as previous study in the country indicated [30] and our finding identified that influenced by social acceptability, availability of methods, own perception, considered as means to minimize stigma and social security. However, the cumulative effect has forced women to demand at least two children, the reason was to continue their offspring's who will support each other and leave with existed stigma.

In general, there is deep routed misconception about pregnancy and women especially at early stage of marriage in our community , male acceptance, relation of child bearing as the issue of women, interference of extended family and social encirclement in general predisposes women to unplanned pregnancy as different studies from developing countries such as Argentina 55% [31] and sub-Saharan African 10-65% [32] of HIV positive women reported unplanned pregnancies [31, 32]. This result indicates importance of public health intervention that targets HIV positive women.

Clients have fertility desire and demand for verity of contraceptive methods. However, providers think in terms immunological (CD4 count) and clinical improvement. The result is consistent with earlier study from South Africa [33]. Further more, HIV positive women had not discussed their fertility desires with health care providers due to fear of anticipated negative reactions; this is consistent with previous studies from Africa [10, 13, 34] . Those women who tried found that providers were busy and not open for discussion and others also admitted that reluctant by assumption that providers know the best option for them.

Similarly, providers evidenced wide spread misconception about options and safe methods largely resulted from insufficiently trained providers especially on counseling part. More over, providors noticed that they usually discuss pregnancy risk and STIs risk separately. The counseling ways did not help them to think comprehensively and the issue more severe when the fertility need of clients not considered at all. Then updating providers should be vital issue to satisfy the current need of women living with HIV in the study area.

In conclusion, the finding indicated existed progress in integration of contraceptive and HIV services in the study area. However, study identified numerous gaps on information related to contraceptive options among HIV positive women and wide range of misconception about fertility need of women living with HIV. The study also emphasize the need to augment knowledge on safer contraceptive options to clients and their providers and improve target oriented support to women who wish to have children in the study area.

LIMITATIONS OF THE STUDY

This study has the following limitations; limited to the reflection of positive women and their providers. It failed to include the view of male and HIV negative women. More over the findings are confined to urban area where care and support activities are well organized in comparison to the rural set up. It is recommended to conduct the study in rural setting and different contexts in the country so that will help to view from different perspectives.

Competing interests

We declare that there are no financial or non-financial competing interests related to this study.

Authors' contributions

Both authors contributed equally during design and conduct of the study. HM and FE participated in data collection, statistical analysis and interpretation of findings. HM prepared the draft then FE revised the draft of the paper. All authors read and approved the final content of the manuscript.

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