

**FERTILITY DESIRE, INTENTION AND ASSOCIATED FACTORS AMONG PEOPLE LIVING
WITH HIV SEEKING CHRONIC HIV CARE AT HEALTH FACILITIES OF HAWASSA CITY,
SOUTHERN ETHIOPIA**

By

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is my own work and that all the sources that I have used or quoted have been indicated
and acknowledged by means of complete references.



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March 18, 2014
DATE

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FERTILITY DESIRE, INTENTION AND ASSOCIATED FACTORS AMONG PEOPLE LIVING WITH HIV SEEKING CHRONIC HIV CARE AT HEALTH FACILITIES OF HAWASSA CITY, SOUTHERN ETHIOPIA

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ABSTRACT

INTRODUCTION: Late in HIV epidemic while HIV program is maturing studies in rich and resource limited setting have shown controversial results with regard to whether childbearing desire and intention are changed after the expansion of ART and PMTCT services. There are few studies in Ethiopia which tried to find out fertility preferences after the decentralized ART and PMTCT services.

PURPOSE: The objective of the study is to determine the prevalence of fertility desire, intention and associated factors among HIV positive males and females at health facilities in Hawassa city with chronic HIV care.

METHOD: The study used quantitative, observational, analytic and cross-sectional study design. It was structured on Trait-Desire-Intention-Behaviour theoretical frame work. A gender based stratification followed by random sampling method was applied. An interviewer-administered structured data collection approach using the pre-tested questionnaire was applied in the study. The Microsoft Office Excel 2007 and Epi-Info version 3.5.3 were utilized for data analysis. In addition to descriptive statistics, both bivariate and multivariable logistic regressions were used to analyse the data.

RESULT: With a respondent rate of 93%, a total of 460 PLHIV participated in the study with equal number of males and females. The majority of the participants were from urban (85%), in relationship (70.9%), and on ART (80%). The reported fertility desire, 43.9% (45.2% in males; 42.6% in females), and fertility intention, 44.9% (46.4% in males; 43.4% in females), were high. The median number of intended children was 2. About 54% of PLHIV were using at least

one of the contraceptives with 32.4% of unmet need of family planning. Participants with overall experience of 2 births or less (AOR: 2.4 95% CI 1.32-4.32; p-value=0.0042), without birth experience after HIV diagnosis (AOR:0.52 95% CI 0.28-0.98; p-value=0.0424) and whose partner also desired for childbearing (AOR: 19.73 95%CI 10.81-35.99; p-value=0.0000) were more likely to intend for a/another child. They wished and planned to get birth because; they did not have a/children before or fear of childless stigma (25.3%), ART could help to have negative child (21.8%), importance of parenthood (17.8%) and the desire of once partner (16.8%). The study participants had consulted health care workers (34.2%), approached their partner or their partner had already approached them (27.6%), tried to get a partner or married (17.6%) and stop using family planning (6%) to get pregnant.

CONCLUSION: This study highlights high fertility desire and intention in the background of high unmet need for family planning among PLHIV. A development of comprehensive male partner-involved couple counseling protocol, improving the communication HCWs have with PLHIV to emphasize safer conception methods and strengthening all the components of PMCT integrating with other SRH services at chronic HIV clinic are critical.

KEY CONCEPTS: HIV/AIDS; TDIB theoretical frame work; people living with HIV; partner fertility desire; births after HIV diagnosis

DEDICATION

I DEDICATE THIS DISSERTATION TO MY LATE FATHER,

GASHU DEMEMEW AYELE

MAY YOUR SOUL REST IN ETERNAL PEACE DEAR DAD

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ACRONYMS

AIDS	Acquired Immunodeficiency syndrom
ART.....	Anti-retroviral therapy
CDC.....	Centre for Disease Prevention and Control
CIOMS.....	Council for International Organizations of Medical Sciences
EDHS.....	Ethiopia Demographic Health Survey
FHAPCO.....	Federal HIV/AIDS prevention and control organiation
FMOH.....	Federal Ministry of Health
HCW.....	Health Care Workers
HIV	Human immunodeficiency virus
ICPD.....	International Conference on Population and development
IRB.....	Institution of ethical Review Board
IUCD.....	Intra-uterine Contraception device
MDG.....	Millennium Development Goal
NCM.....	Negative Childbearing Motivation
PCM.....	Positive Childbearing Motivation
PLHIV.....	People living with HIV
PMTCT.....	Prevention of Mother to Child Transmission\
REC.....	Review of Ethical clearance
RH.....	Reproductive Health
SNNPRS.....	South Nation and Nationalities people republic state
SRH.....	Sexual and Reproductive Health

SSA.....Sub-Saharan Africa

STI.....Sexually Transmitted Infections

TDIB.....Trait Desire Intention and Behaviour

TFR.....Total Fertility Rate

UNAIDS.....Joint United Nation Program on HIV/AIDS

UNFPA.....United nations Population Fund

WHO.....World Health organization

CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION

With the scale up of Highly Active Anti-retroviral Therapy (HAART) for the treatment of HIV, new concern relating to fertility desire and intention has risen. According to Cooper et al (2009:44), improved quality of life and survival following commencement of anti-retroviral treatment (ART) may lead to the increase in the desire and intention to have children among HIV infected individuals. Results from surveys and qualitative studies indicate that women on HAART resume their love and sexual activity once their health is regained and intend to have children (Smith et al 2007:37-41; Maier et al 2008:35; Oladapo et al 2005:1674).

According to Ethiopian Demographic Health Survey (EDHS) (Central Statistical Agency [Ethiopia] and ICF International 2012:69-234), Ethiopia is characterized by the culturally valued high fertility, high HIV prevalence, low level of contraception and increased intention to have a child. The current total fertility rate is 4.8% (2.6% in urban and 5.5% in rural). Unmet need for family planning among married women is still high, 25.3% (UNFPA 2012:3). In the general population, according to EDHS of 2011, the need to limit a birth is still low (36.5%) (Central Statistical Agency [Ethiopia] and ICF International 2012:89). In this survey (2012:234) it is also mentioned that adult national HIV prevalence (15-49 years) estimate for 2012 is 1.5%. Women have a higher HIV prevalence (1.9 %) than men (1.0 %).

However, in the background of these high fertility rate and HIV prevalence, the high fertility desire and intention is not disaggregated by HIV status in Ethiopia. Yet there is a need to address the reproductive need of people living with HIV for there is a complex relationship between HIV and fertility. Therefore, this cross-sectional study is designed to determine the extent of desire and intention of child bearing decision of HIV positive patients receiving HIV/AIDS care at health facilities in Hawassa city of Ethiopia and how these vary with socio-demographic and other health related factors.

1.2 BACKGROUND TO THE RESEARCH PROBLEM

Studies in both developing and developed countries indicate that HIV infected men and women desire children. A study in USA (Finocchiaro-Kessler et al 2010:1106-14) reveal that a fertility

desire (59%) and intention (66%) of those who desire a child were high among Africa-American women whose culture values childbirth. In South Africa, 30% of clients enrolled to chronic HIV care expressed a desired to have children (Myer L et al 2007: 278). In Malawi (Sara 2009:15) 20% of women and 13% of men wanted to have children despite receiving HIV positive test results.

There are also other studies with opposite findings attributed to fear of HIV transmission to the offspring, HIV associated stigma of having children and health issues. Homsy et al (2009) find that HIV positive individuals have a much greater desire to stop childbearing than their HIV negative counterparts. In a study by Cooper et al (2009:41), 55% of women and 43% of men living with HIV reported not intending to have children. Snow et al (2011:12) indicate that HIV positive women were significantly less likely to desire future childbearing in relation to HIV negative women despite universal anti-retroviral treatment (ART) in the study sample. According to systematic literature by Rutenberg et al (2006:2) the 10 articles from developing countries show that HIV status does not appear to have an effect on fertility intention whereas the 27 articles from developed world are found to be inconclusive.

There are studies which show that ART may further enhance fertility desire of HIV positive women. According to Maier et al (2009:31), ART was associated with increased odds of fertility desire (Adjusted Odds Ratio (AOR): 2.99, 95% confidence interval (CI) 1.38-6.28), but decreased odds of pregnancy (Adjusted Odds Ratio (AOR): 0.56, 95%, CI 0.33-0.95) and live births (Adjusted Odds Ratio (AOR): 0.30, 95% CI 0.13-0.66). HIV positive women in Uganda receiving ART expressed increased fertility desire compared to those not yet receiving treatment (Maier et al. 2009:31). Another study in South Africa by Myer et al (2007:278) also indicated that fertility desire would be getting higher as the duration of ART among female participants is increasing. This is because ART enables to regain healthy sexual life of people living with HIV (PLHIV) who starts to plan for future fertility (Cooper et al 2009:41).

Different kinds of studies in different settings have shown that a lot of factors are associated with fertility desire and intention. Age, ethnic background, previous pregnancy history, place of residence (rural or urban), stigma of childless and cultural importance of parenting was found to be the predictors of intention for pregnancy (Loutfy et al 2009). Increasing age, shorter time since diagnosis of HIV infection, non-disclosure of sero-status to current partner significantly increased the odds of desire for childbearing (Oladapo et al 2005:1677). In Ugandan, study by

Kakaire et al (2010:27) indicate that those with more sexual partner were more likely to have fertility intention (p-value <0.05). In the same study; age, marital status of the respondents and when any of the participant's children had died is independently associated with desiring a child in the near future among HIV positive persons. However, being on ARVs was not associated with fertility intention as the proportion of PLHIV started on ART was small and ART expansion had just been started. That is why other studies lately done in Uganda reveal that ART is associated with increased pregnancy rate in HIV positive women, particularly those with increased CD4 count and good immunologic response to ART (Fredric et al 2011; Homy and Bunnell 2009).

1.3 STATEMENT OF THE RESEARCH PROBLEM

According to the EDHS (Central Statistical Agency [Ethiopia] and ICF International 2012:13), 42% of married Ethiopian women did not want more children though not segregated by HIV status. A few studies done in Ethiopia trying to deal with the desire to bear children among PLHIV are with controversial findings. For example, un-published study done in Addis Ababa by Tamene and Fantahun (2007:29) show that 44.7% of women, 35.2% of men and 40.2% of the overall HIV positive individuals receiving chronic HIV care desired to have children. A study done by Dibaba (2008:29) reveals an opposite findings: most of the married HIV positive women (47%) intended to limit childbearing. However, Menberu et al (2010: 214-218) indicated that 18.3% of currently married PLHIV have decided to have a child. The study by Menberu and his colleagues also found that higher family income (Odds Ratio (OR): 2.39, 95% CI 1.23-4.26), partner decision to have a child (Odds Ratio (OR): 36.4 95% CI 17-77.5) and having a partner with negative test result are factors which are independently associated with current decision to have a child and suggested that factors identified to be associated with fertility decision could be of major importance and as such should be investigated further. Late in HIV epidemic while HIV program is maturing in Ethiopia, PLHIV are fall to get pregnant. It is reasonable thus to identify factors associated with fertility decision in PLHIV during this period. Moreover, few studies in Ethiopia have focused on exploring the appropriateness of a theoretical framework or conceptual model to describe the fertility desires among PLHIV. Therefore, it is also essential to identify factors associated with desires and intention of fertility in HIV positive patients.

1.4 AIM OF THE STUDY

Understanding the fertility desire and intention is a basis for family planning programs and for population policy formulation. It determines the demand for contraception and potential impact on the rate of reproduction. Analyzing the factors associated with pregnancy desire and intention is critical for Ethiopia with a population policy focused at reducing fertility, transmission of HIV and birth of HIV infected children. Identification of these factors is also important to deal with the low unmet need of contraception among PLHIV in the nation.

1.4.1 Research purpose

The purpose of the study is to determine the fertility desire, intention and associated factors in HIV positive male and females at health facilities with chronic HIV care in Hawassa city, Southern Ethiopia.

1.4.1.1 Research Objectives

1. To determine the prevalence of fertility desire both in HIV positive males and females on follow up of chronic HIV care,
2. To determine the prevalence of fertility intention both in HIV positive males and females on chronic HIV care follow up and
3. To identify factors associated with fertility desire and intention in HIV positive men and women on the follow up care in health facilities of Hawassa city.

1.5 SIGNIFICANCE OF THE STUDY

The findings of this research will be applicable in the improvement of the practical knowledge regarding the provision of HIV care integrated with family planning and other reproductive health services. So, there is a need for counselling to facilitate informed decision making about childbearing and family planning, and there is future need for social services for children born to infected parents among HIV positive people.

1.6 DEFINITION OF KEY CONCEPTS

People Living with HIV (PLHIV) on Chronic HIV care

These are people with confirmed and documented HIV test results who have already been enrolled to ART clinic, had at least one visit and have got comprehensive HIV care and treatment in the health facilities before the interview.

Fertility Desire

Conceptual Definition: MacMillan Dictionary defines ‘desire’ as “strong feeling of wanting to do something”.

Longman Dictionary (2009:458, sv ‘desire’) defines desire as a strong hope or wish for something.

Fishbein (1973) and Pritchett (1994) described fertility desire as a value that develops under certain socio-economic cultural and political condition and it reveals people’s wills and desires on the number of children, quality of children, childbearing time and children’s gender.

Operational Definition: Fertility desire refers to the respondents’ wish to have a child or more children in the future. The question to ask is: “would you like to have a/another child in the future?”. WHO (2009:54) also put the desire for children to be questioned whether the respondent wants to have a child/another child or whether the respondent’s spouse or partner wants to have a child/another child.

Fertility Intention

Conceptual Definition: “A plan in your mind to do something” is the definition given to fertility intention by MacMillan dictionary. Intention is also defined as a plan to do something or a deliberate act. Miller (1994) described intention as a conscious commitment to act or try to achieve a particular goal, here childbearing.

Operational Definition: According to Miller (1994), fertility intention can be described as the number of children one expects to give birth to in the future or as “How many children do you intend to bear in the future?” as described by Olutemi (2005:1675).

Moreover, fertility desire will be defined by the response to a question asking whether the respondent would like to have children in the future. Women who are trying to get pregnant will be included in the “desire children” category. Of respondents who indicated they will like to have children in the future, fertility intention will be defined by a separate question asking how many children the respondents expected to have in the future. A pregnant participant with wanted pregnancy will be treated as missing response and respected to both fertility desire and intention.

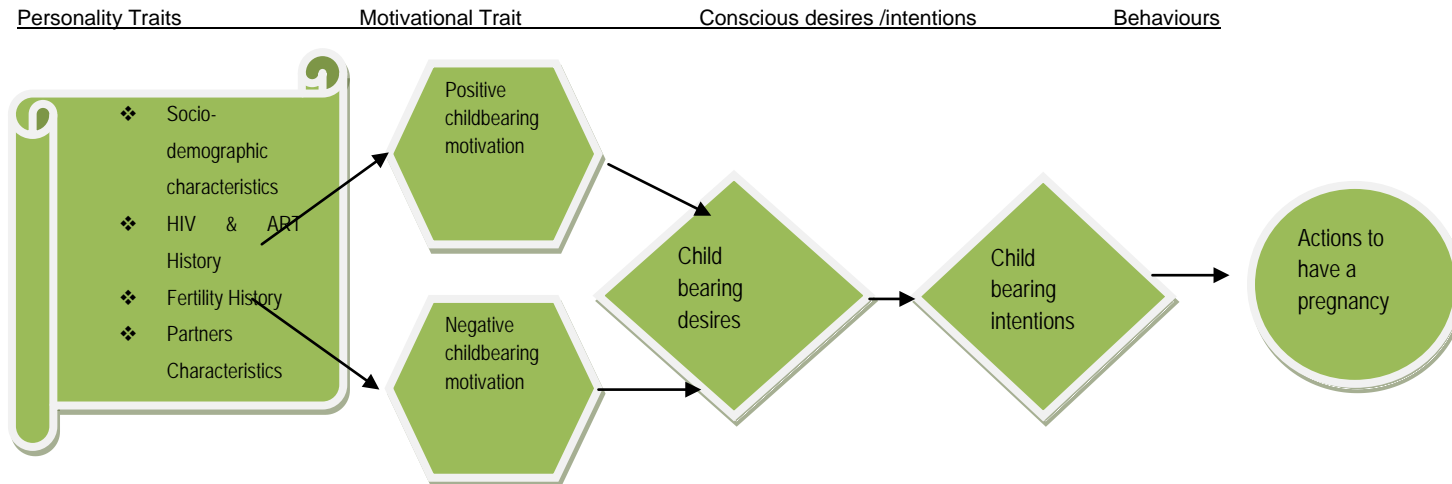
1.7 FOUNDATION OF THE STUDY

1.7.1 Theoretical Framework

The theoretical framework of this study is based on the Traits-Desire-Intention-Behaviour (TDIB) theory developed by Miller (1994) to describe the psychological sequences that culminate in reproductive behaviours. The frame work was used by Miller to trace the sequence of how childbearing motivation leads to fertility desire, fertility intention and subsequent childbearing.

There are four steps of psychological sequences described by Miller (1994): the motivation of traits which leads to desire, translation of desire into intentions, and the activation of intention in the form of behaviour. According to TDBI theoretical framework, traits that predispose the individual towards or away from being and caring for children are activated into conscious desire for or against having a child. Eventually, the intention is implemented through a behaviour that leads either to the achievement or to the avoidance of conception and subsequent childbearing.

According to Miller (1995), variation of both implicit and explicit motivational traits may present situation or circumstances that determine whether desires are translated into intention. Childbearing motivational traits in a traditional African society like Ethiopia include personal and socio-cultural characteristic; age, marital dissolution, unplanned pregnancy, fertility complications also presents a set of more complex reason for desiring children. Equally important is HIV related factors such as quality of life, use of ART, time since diagnosis of HIV infection, disclosure status are also possible motivational traits among PLHIV. According to Miller theory the aforementioned factors, independent variables for this study, explain the outcome of the study, fertility desire and fertility intention. Thus, the extent of fertility desire and intention of PLHIV on ART are examined in terms of the above mentioned factors. Based on the TDIB theoretical frame work; therefore, the following conceptual framework is developed to carry out the study.



(Source: Miller WB. 2011:84)

Figure 1.1: Conceptual frame work of fertility desire and intention study based on the TDIB theory

1.8 RESEARCH DESIGN

1.8.1 Research Paradigm

This study was based on the quantitative research paradigm which is closely associated with positivist tradition.

1.8.2 Study Design

The non-experimental or observational, analytical and cross-sectional study design will be utilized to carry out this study.

1.9 RESEARCH METHODS

1.9.1 Population and Sample Collection

1.9.1.1 Study Setting

The study was conducted in Hawassa city, the capital of Southern region, where the three health facilities; Hawassa Hospital, Adare Hospital and Bushulo health centre are sited.

1.9.1.2 Research Population

The research population in this study are PLHIV who are on chronic HIV care in Ethiopia.

Target Population

In this study theoretical population are PLHIV on chronic HIV care in health facilities of Hawassa city.

Accessible Population

In this study, the accessible population is PLHIV who will visit chronic HIV clinic in the three health facilities during the period of data collection.

Sampling frame

In this study the frame work is all lists of men and women living with HIV on chronic HIV care who fulfil the eligibility criteria in the three health facilities.

Inclusion Criteria

People living with HIV/AIDS in reproductive age group (18-49 for women and 18-54 for men) and had at least one visit to the selected three hospitals chronic HIV care units were candidates. Also, those who showed willingness to consent for participation in the study and those who could hear and speak Amharic were included.

Exclusion Criteria

All PLHIV: who were unable to hear, mentally disabled, seriously ill and those younger or older than the age specified in the inclusion criteria were excluded from the study.

In the fertility desire study, a probability sampling; specifically, stratified sampling followed by random sampling, was applied. In this study, the stratification was based on gender after application of inclusion and exclusion criteria. Equal number of males and females were randomly selected from the three health facilities. Then after, a sampling frame was prepared using registers of the patients. It was from their registers that random table is produced. Participants were selected randomly from the table. Therefore, a probability sampling was used.

Sample Size

The sample size determination is based on the assumption that 50% of HIV positive individuals may desire and intend to have children with 5% margin of error and 95% confidence interval ($\alpha=0.05$). A non-response rate is assumed to be 20%. According to Daniel (2009:183), the actual sample size for the study was determined using a formula for single population proportion.

$$n = \frac{(Z_{\alpha/2})^2 p(1-p)}{d^2} \qquad n = \frac{(1.96)^2 \times 0.5(1-0.05)}{(0.05)^2}$$

Where:

n=the required sample size

z= standard score corresponding to 95% CI

p= Assumed proportion of reproductive health needs

d= the margin of error 5%

None response rate = 20%

n= 384 + 20%

None respondent rate 20%= 77. Required sample size will be 384 +77=461.

Based on the patient load, sample size of 231, 115, and 115 were obtained from HAWASSA hospital, BUSHULO health centre and ADARE hospital respectively.

1.9.1.3 Data Collection

An interviewer-administered structured data collection approach using the pre-tested questionnaire was used in the study. The questionnaire was initially prepared in English. Later it was translated to Amharic, the national language, for data collection. The recruited interviewers who don't work in chronic HIV clinic before were trained and practised the interview before the commencement of data collection.

1.10 DATA ANALYSIS

Data was entered twice in to a computer. This was for verification. Differences in keyed data of the same questionnaires need to be reconciles so that the information presented in the questionnaires is faithfully keyed (International Household Survey Network (IHSN) [S.a.]). Microsoft Office Excel 2007 and 2011 Epi-Info version 3.5.3 statistical package were used. Frequency and proportion were applied for categorical variables. For numerical variables, mean and standards deviation were implemented. Chi-square test for categorical variables was used. Bi-variate test of association was also used. Characteristics of participants who reported fertility desire and intention were compared with those who would not. Multivariable logistic regression was used to adjust for confounding, co-linearity and interaction and thereby analyse factors that were independently associated with fertility intention and desire.

1.11 ETHICAL CONSIDERATIONS

The initial review of research protocol was conducted by Research Ethical Committee (REC) at UNISA. The REC approved the protocol after reviewing informed consent documentation and data collection instruments in addition to the research protocol. The committee monitored and confirmed that the protocol was being followed as approved (Rivera & Borasky 2009:53). The approved protocol of this study was submitted to Institutes of Review of Board (IRB) of Southern region Health Bureau research wing. Then, letters from regional health bureau were

obtained to communicate with the medical directors of Hawassa and Adare hospitals as well as Bushulo health centre.

As a researcher, honesty was kept because collecting objective data in a socially responsible way is basic to scientific research. This study integrity was accomplished by training the staff in research ethics, by strict adherence to study procedures, and by being transparent in identification and management of conflict of interest (Rivera & Borasky 2009:60).

Study participants were briefed on the aim and significance of the research. Informed written document was signed before the interview. Verbal consent was also obtained from those who cannot read and write. The participants were informed that the participation is absolutely voluntary and refusal is possible. They were told that there would not a penalty for not participating. Refusal to participate will have no effect on the routine service they are being given. They were told their name would be anonymous. Confidentiality of their information was kept. So, unauthorized individuals could not be accessed to data. The data was recorded electronically and back-up of multiple copies were kept in secured multiple locations. In general, the research was conducted per the approved protocol of the ethical committee.

1.12 SCOPE AND POSSIBLE LIMITATIONS OF THE STUDY

Southern region is known for its diversity in ethnicity and languages. That is why the working language, Amharic, is made to be used in the questionnaires for the challenge of translating to different languages. There could be problem of understanding Amharic language. The other possible limitation can be that the sample will be from clinic based population which can create the challenge of generalizability. Also, the study lacks well defined comparison group.

1.13 STRUCTURE OF THE DISSERTATION

The dissertation is structured into five main chapters.

CHAPTER-ONE: The orientation to the study section introduces the research question, aim, design and the methodology used to execute the study.

CHAPTER-TWO: This is the literature review section which discusses relevant literatures regarding the problem statement, concepts of fertility desire and intention, theoretical frame works, and sexual and reproductive health including HIV and family planning.

CHAPTER-THREE: The design and methodology chapter deals with the details of the study blueprint.

CHAPTER-FOUR: Result and analysis section is a key part of the dissertation where study findings are described, analysed and discussed.

CHAPTER-FIVE: Conclusion and recommendation is the last section of the dissertation where the study finding is summarized and interpreted. Also the potential contribution and application as well as the limitation are presented in this section.

1.14 CONCLUSION

Studies in rich and resource limited setting showed controversial results with regard to whether childbearing desire and intention are changed after the advent and expansion of ART/PMTCT services. There are few studies in Ethiopia which tried to find out this issue. With the aim of assessing the fertility desire and intention as well as the associated factors, the study used quantitative, observational, analytic and cross-sectional study design. It's based on Trait-Desire-Intention-Behaviour theoretical frame work developed by Miller. Data was collected by structured face-to-face interview at three health facilities in Hawassa city after ethical clearance was obtained from UNISA REC and IRBs of southern region health Bureau. The study was piloted. The collected data was analyzed by Microsoft Office Excel 2007 and 2011 EPI-Info where both descriptive and inferential statistics are applied. However, this study was conceived after a thorough literature review to come up with the research question and the gap area regarding SRH. Thus, the next chapter will be looking at the report of literature review done for the fertility desire and intention study.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This is the chapter which enabled the researcher to identify the research problem and the programmatic gaps with regards to SRH and HIV. In this chapter detailed review of the research topic, fertility desire and intention, is carried out. It starts with MDGs, SRH including HIV, explaining the essence of achieving the targets of SRH as cornerstone to achieve other targets of MDGs goals. SRH is defined and its components are listed. Global and Ethiopian context and challenges of SRH and epidemiology of HIV/AIDS are dealt with.

Fertility theories specifically TDIB theoretical frame work, as used in this study, is explained. An emphasis is also given to the impact of HIV/AIDS epidemic on preference of reproductive health and the factors associated with fertility desire and intention among PLHIV.

2.2. MILLENNIUM DEVELOPMENT GOALS AND SEXUAL AND REPRODUCTIVE HEALTH

Millennium Development Goal 5 (MDG 5) calls for a reduction in the maternal mortality ratio (MMR) by three-quarters between 1990 and 2015, equivalent to an annual decrease of about 5.5 %; and for universal access to reproductive health care by 2015 (United Nations Millennium Development Goals 2000). Even though reproductive health (RH) was lately renewed and included as one of the targets of MDG 5 (Target 5B, Universal access to Reproductive Health) in Cairo (International Conference on Population and Development (ICPD 1994)), the achievement of nearly all the MDGs depends on success in the universal access to reproductive health services (Gruskin, Ferguson, and O'Malley 2007:4; WHO 2011:1). That is why Kofi Annan stated "The Millennium Development Goals, particularly the eradication of extreme poverty and hunger, cannot be achieved if questions of population and reproductive health are not squarely addressed. And that means stronger efforts to promote women's rights, and greater investment in education and health, including reproductive health and family planning", on his statement to the Fifth Asian and Pacific Population Conference. The agreement regarding the Universal access to reproductive health was that "all countries should strive to make accessible through the primary health care system, reproductive health to all individuals of appropriate ages as soon as possible and no later than 2015" (ICPD, 1994; WHO, 2011:1).

2.3 SEXUAL AND REPRODUCTIVE HEALTH: DEFINITION

As described above, the right to sexual and reproductive health is acknowledged internationally as a universal human right. It was first defined in the Programme of Action of the United Nation's 1994 ICPD. Thus, Reproductive health in ICPD (1994) is "...a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, in all matters relating to the reproductive system and to its functions and processes. Reproductive health therefore implies that people are able to have a satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so".

2.4 SEXUAL AND REPRODUCTIVE HEALTH: COMPONENTS

As defined at the ICPD (1994), SRH includes family planning, maternal health, newborn health and breastfeeding, infertility, prevention of unsafe abortion, Sexually Transmitted Infections (STI) including HIV, other reproductive morbidities (cancers) , sexual health harmful practices (e.g., female genital mutilation).

2.5 HIV/AIDS

AIDS is a disease caused by HIV virus belonging to family retroviruses (retroviridae). It has unusual life cycle which requires transcription of RNA to DNA. Out of the two kinds of HIV, HIV type I is the major cause of major epidemics throughout the world. Type II is less virulent and found in West Africa (Longo DL, Kasper DL, Jameson JL, Fauci AS, Hauser SL, Loscalzo J 2012). According to Federal HIV/AIDS prevention and control office of Ethiopia (FHAPCO 2006), HIV I with group M and clad C is the most common and fast progressing infection found in Ethiopia. The viral ability to replicate so fast (10 billion per day) and associated possible point mutation poses a challenge to develop a cure. Infection by HIV virus results in both depletion and dysfunction of elements of immune system. This is due to its complex and excessive damage of immune cells with CD4 cell marker. It takes an average of 7-10 years for opportunistic infections or AIDS defining disease to appear (Longo et al 2012).

Lee Goldman, on Cecil Medicine (2007), has mentioned that global importance of mode of transmissions is unsafe heterosexual (80%) and homosexual sex (4-6%). Unprotected female to male intercourse accounts for a large cases HIV infection in developing countries like Ethiopia. The second leading mode of spread is mother to child (6-7%). Unsafe injections and blood are also responsible for up to 5% of infections. Though seldom noticed in Ethiopia, injection use of drugs (IUD) is the main mode of transmission in Asia (FMOH/HAPCO, 2006).

It was 3-5 years after the first recognition of HIV (1981) in major cities of US that the first epidemic was noticed in Ethiopia in mid of 1980's. Initially, HIV infection was noticed in 1984 and the first two cases were reported to Ministry of Health in 1986 (AIDS in Ethiopia, 2006:8). Since then it becomes not only the most serious health threat of the early 21st century but also one of the greatest impediments to social and economic progress in heavily affected countries. These include sub-Saharan Africa especially southern most part as well as the East where

Ethiopia is sited (Goldman L 2007). Also HIV/AIDS is the main cause of rise in the maternal mortality in SSA (UNAIDS, 2012:24).

2.5.1 Global, Regional and National Context of HIV /AIDS

“ We are living in an ‘international’ society and HIV has become the first truly ‘international’ epidemic, easily crossing ocean and border” mentioned on global HIV/AIDS report, 2008. Not less than 2.5 million people around the globe have died of AIDS related illness. In 2011, an estimated 34 million people were living with HIV in the world. Twenty-three million (70%) of them are in Sub-Saharan African countries (WHO, 2013). In other words, SSA remains the severely HIV affected region with nearly 1 in every 20 people. Here most infections are through heterosexual with both generalized and conventional epidemic (4.9%) living with HIV (UNAIDS, 2012:24).

UNAIDS (2012) in its global report revealed that there are 790,000 PLHIV in Ethiopia. Adult HIV prevalence in Ethiopia is 1.5%, 1% for males and 1.9% in female. The rural and urban adult HIV prevalence is 0.6% and 4.2% respectively. Gambella is the region with the highest HIV prevalence, 6.5%. Southern region, where this study was carried out, accounts for 0.9% (Central Statistical Agency [Ethiopia] and ICF International. 2012:235).

In SSA, there is a drop in the prevalence rate from 5.9% in 2001 to 4.9% in 2011 partly due to improved access to Anti-retroviral Therapy (ART) and focused intervention (UN Economic Commission of Africa, African Union, African Development Bank Group, and UNDP 2013). UNAIDS (2012:27) report also indicates that AIDS related death decline by 33% in Africa and this reduction is 53% in Ethiopia from 2005 to 2011. In Ethiopia, this is mainly due to the ART coverage which is 86% for adults and 20% for children. But the PMTCT coverage is at lower level of 24%, according to Global Annual progress Report (GAPR) (UNAIDS, 2012:27-30).

2.5.2 Heterogeneous Epidemics of HIV/AIDS in Ethiopia

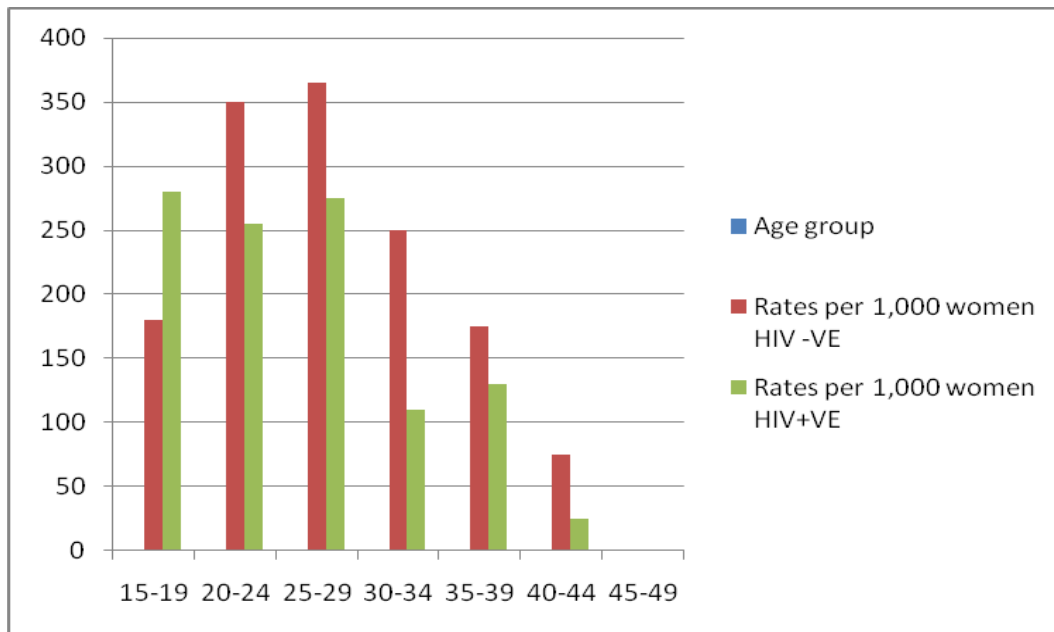
Data generated by federal HIV/AIDS Prevention and Control Organization of Ministry of Health (HAPCO/MOH) (2007) revealed that prevalence of HIV/AIDS is stabilizing in urban area and increasing gradually in rural area. In urban, the epidemic started in the mid-1980. It stabilized afterwards, even decreasing in major urban areas, but increasing in the smaller towns with HIV hot-spot. In relative terms the rural epidemic is widespread though heterogeneous. Most regions have low prevalence of HIV (0.8-2.7%). Similarly, rural small towns and market centre

are with high burden than bigger towns. This marked urban-rural variation has been recognized since the early age of epidemics.

2.6 FERTILITY, FERTILITY DESIRE AND HIV/AIDS

In the absence of ART, women infected with HIV have both a physiologically reduced risk of pregnancy, and an elevated risk of pregnancy loss (Ross 2004:799). Reduced fertility in women living with HIV can be caused by severe clinical presentations of pelvic inflammatory disease and tubo-ovarian abscesses which may require more surgical intervention (Glynn JR et al 2000:260). It is also shown by Lysterly and Anderson (2001) that HIV can cause men's hypo-gonadism, reduced sperm motility, number, concentration which can again lead to reduced fertility. PLHIV thus may be more likely to have difficulty in getting pregnant and to request assistance. So, they should be given full support and counselling and advise of their options, including adoption and assisted reproduction, if available (WHO/UNFPA 2006:25).

Longitudinal study performed in Uganda by Carpenter et al (1997) showed that fertility rates in all age groups except 15-19 years declined with HIV positive status (see figure) . The reduction in fertility due to HIV/AIDS is high: 26% in 20-24 year age group, 28% in ages 25-29, 57% in ages 30-34, 31% in ages 35-39, 63% in ages 40-44 and 100% in ages 45-49. It is not surprising that with exception of ages 35-39, the level of decline increases with age of women since the HIV effects are combined with other fertility inhibition problems, such as natural infecundity that afflict older women.



Source: Extracted from Zaba and Gregson (1998)

Figure 2.1 Age specific fertility rates for HIV positive and negative women aged 15-49 years in Masaka, Uganda, 1989-96.

James and Ntozi (2002) showed that the long-term influence of an HIV epidemic on population level fertility extends beyond the aggregated impact of its individual level effects. This is because, over time, it will significantly alter the composition of the population. In the early years of an epidemic, individuals with high rates of sexual partner acquisition and low levels of condom use become infected and die faster than the population as a whole. If not replaced, according to James and Ntozi (2002) their representation in the population will decline. If their fertility differs from that of the general population, overall fertility will be affected wherever they comprised a significant fraction of the initial population.

The authors have also stressed that infertile women experience higher rates of STIs and partner change and, thus, higher risks of HIV infection. In a major HIV epidemic, the proportion of women who are infertile will decline and population level fertility will tend to increase. Other population sub-groups may also be affected disproportionately with contrasting effects. For example, later in an epidemic, if less educated people respond more slowly to education and information campaigns, they may have higher infection rates a phenomenon which would suppress fertility in some populations.

Therefore, studies done both in SSA and developed countries early in HIV epidemic revealed that HIV infection somehow depressed the fertility and fertility desire of PLHIV. There were biological, social and health reasons as to why HIV decreased desire for children during early HIV epidemic when opportunistic infections had been affecting peoples. HIV infection can decrease fertility and sometimes lead to infertility due to decreased sperm production; HIV associated sexually transmitted infection and etc. PLHIV with different kinds of opportunistic infections could not be sexually active, get married, or could do commit marital separation. This again could lead to a decreased fertility. As seen in the table below delayed onset of sexual relations, increased condom use, increased induced abortion, HIV related sterility, increased fetal death are some of the mechanisms through which HIV decreases fertility and then fertility desire. Thus, there could be a depressed fertility need, yet no total absence of need of childbearing during the early HIV epidemic when PLHIV are affected by different HIV related diseases due to reduced polygamy, increased family size and the need to replace the deaths to HIV/AIDS. See table below

TABLE 2.1: MECHANISMS FOR POSSIBLE IMPACTS OF HIV/AIDS ON FERTILITY IN SUB-SAHARAN AFRICA

Proximate Determinants of Fertility	Possible Mechanism for Impact	Possible Effect on Fertility
Marriage		
	Delayed onset of sexual relations	Negative
	Reduction in premarital sexual relations	Negative
	Delayed marriage or non-marriage	Negative
	Reduced polygamy	Positive
	Increased divorce	Negative
	Increased widowhood	Negative
	Reduced remarriage	Negative
Contraception		

18		
	Reduced desired family size	Negative
	Increased desired family size	Positive
	Increased condom use	Negative
	Switching from other family planning methods to condom	Positive
Pregnancy and Abortion		
	Reduced pregnancy rate	Negative
	Increased induced abortion	Negative
	Increased spontaneous abortion	Negative
Breastfeeding and Postpartum abstinence		
	Reduction in breastfeeding to avoid mother-to-child HIV transmission	Positive
	Reduction in postpartum abstinence	Positive
	Reduction in breastfeeding and postpartum abstinence due to increased infant mortality	Positive
Pathological sterility		
	HIV induced sterility	Negative
	Reduction in STD prevalence	Positive
Natural Fecundity		
	Increased foetal mortality	Negative
	Reduced frequency of sexual intercourse	Negative
	Decreased production of spermatozoa	Negative
	Reduced spousal separation	Positive

Source: Adapted from Gregson et al (1997)

2.7 THEORIES ON FERTILITY DECISION-MAKING

There are two major theoretical frameworks suitable for studying fertility decision making: the theory of planned behaviour (TPB) and the theory of traits-desires-intentions-behaviour (TDIB).

2.7.1 Theory of Planned Behaviour

The theory of planned behaviour has been applied in the domain of fertility decision-making (Billari F, Philipov D, & Testa MR 2009; Dommermuth et al 2011; Dommermuth L, Klobas J, & Lappegård T 2011). Here an intention is considered as an immediate forerunner of the corresponding behaviour. It is viewed as being formulated under the immediate influence of three groups of factors: (a) personal positive and negative attitudes towards the behaviour, i.e., having a child; (b) subjective norms, i.e., perceived social pressure to engage or not to engage in the behaviour; and (c) perceived behavioural control, i.e., the ability to perform the behaviour, which may depend on the availability of housing, income, or other resources. The partner's intentions are not explicitly considered in the theory. An individual who wants to have a/nother child, and who perceives that his/her partner does not share this wish, is likely to form the belief that the partner does not want her/him to have a/nother child. This perception may influence the respondent's own fertility intentions (Dommermuth et al 2011).

2.7.2 Traits-Desires-Intentions-Behaviour Model: the Construct of Fertility Desire and Fertility Intention

The TDIB theory (Miller 1994:223) sees the behaviour that determines whether or not a pregnancy occurs as the last step of a motivational sequence. It has four steps. The first one refers to motivational traits, or the dispositions to feel, think, and behave in certain ways with respect to fertility. The second stage concerns desires, emotional feelings, or conscious wishes that do not lead directly to action. The third stage refers to intentions, desires constrained by reality, and psychological states that represent conscious commitment to act in a certain way or to achieve a certain goal at some future time.

The eventual goal of the reproductive behaviour is to achieve (proceptive) or avoid (contraceptive) a pregnancy. According to Miller (1994:223), intentions are assumed to incorporate the perception of the desires of significant others, above all the partner; as well as other situational factors that may prevent individuals from simply what they want to do.

In this study, data from 460 PLHIV were used to develop regression model that indicates the two middle steps of T-D-I-B that show how childbearing motivation traits leads to childbearing desire and how the latter lead to childbearing intentions. Both positive and negative childbearing motivations were the primary determinants of childbearing desire. Childbearing desires were the primary determinants of childbearing intentions. In addition, a regression model was also developed to indicate how childbearing motivation affects an individual's perception of his or her spouse's childbearing desire. Above all, partner influence on fertility decision making was considered. Thus, the TDIB theoretical model was preferred to theory of planned behaviour to structure this study.

2.7.2.1 Intentions and Motivation

Childbearing motivation is a motivational trait, as a latent disposition to feel motivated or against childbearing. Antecedents of childbearing motivation can be experience based, inherited or the interaction of both. There is a significant sex difference regarding the experience and gene (Pasta, and Miller 2002). Individuals' perceptions of their spouse's desire to have children were influenced both by their spouse desire and by their own motivation (Miller WB 1994). Miller (1995) describes two motivational traits as Positive Childbearing Motivation (PCM) and Negative Childbearing Motivation (NCM). Their influence is extended through the three steps of TDIB sequence to find expression in desires, intention and behaviours. Individuals with increased PCM will tend to have strong desire to have a child and those with NCM will tend to have strong desire not to have a child. According to Miller (1995) both the desires to have a child and the desire not to have a child are noted in ambivalently motivated individuals.

When it comes to intention it is impossible to ambivalently motivate because it is difficult to both intend to and not intend to have one. This is due to the fact that intention involves decision and a commitment to action (Miler WB. 2010:5)

Miller(1994) described a TDIB frame work as a useful tool where motivational traits predicts desires, desires predicts intentions, intentions predicts behaviours and behaviours predicts fertility (see figure below).

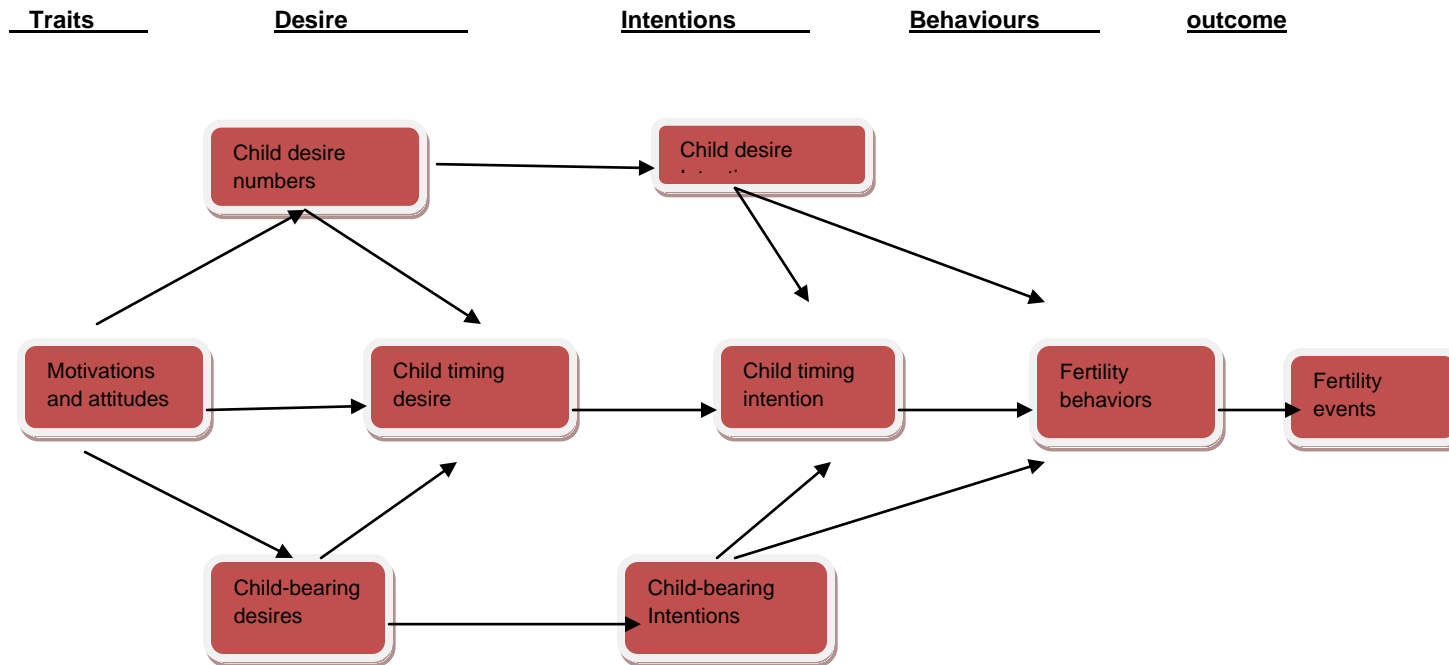


Figure 2.2: An expansion of the TDIB model to show the interactions of two types of traits, three types of desires, and three types of intentions in their effect on fertility behaviours and the probability of any subsequent fertility events. Source: Miller, W.B. (1994 and *Childbearing motivations, desires, and intentions: A theoretical framework. Genetic, Social, and General Psychological Monographs*, 120, 223-258).

2.7.2.2 Conception and Oriented Behaviour

TDI component of TDIB frame work is related to motivational push; having or avoiding a child. The B component has to do with real world implementation of behaviour that achieves the goal (Miller WB. 2010:6). Equivalent to the aforementioned two motivational dimensions, there are two behaviours, proceptive and contraceptive (Miller WB 2010:6). Miller and Pasta (2002) defined prospective as behaviour to achieve conception which will be passively (unsafe sex with intent to conceive) or actively (effort to conceive by sexual timing). Contraceptive behaviour is voiding pregnancy using any family planning method (Miller and Pasta 2002:187-89). Unlike in case of desire, conception oriented behaviours are mutually exclusive and be put on bipolar continuum: a highly effective proception to a highly effective contraception pole with a middle point that include neither of the two.

Thus, it is the bi-dimensional nature of the underlying motivational traits that push towards each of two behavioural poles. In short, the desire not to get pregnant is driven primarily by

NCM and the desire to have a child is driven primarily by PCM (Miller and Past 2002:191; Miller WB 1994).

However, two fold problems in research literature, described by Miller WD (at Vienna, Australia conference December 2010) of TDIB is a conflation of desire and intention where these terms are used interchangeably. Child bearing and child number desire have a property that distinguish them in important ways from childbearing and child number intention. Fertility desire is biologically based affects that drives reproductive behaviours and act directly on behaviour, even when intentions are taken into account (see table below).

Fertility “desires” and “intentions” are used to refer to different things in demography, too. Desires are wishes, which may be based on emotions rather than reality. However, intentions denote a commitment to implementing fertility desires. Therefore, intention comprises both desire and planning aspects (Ivy K, Johnson D and Casterline J 2010:965). However, the questions in international surveys such as the Demographic and Health Surveys (DHS) on fertility preference may not adequately distinguish between the two, perhaps explaining why the two terms are sometimes used interchangeably (Ivy et al 2010:965-68).

Table 2.2: A CROSS-TABULTION OF THE THREE MOTIVATIONAL CONSTRUCTS IN THE TDIB FERTILITY FRAMEWORK WITH DIFFERENT CONSTRUCT CHARACERISTICS.

Adapted from Miller WB. (2010) Chapter 3 in why we have children: Building a unified theory of the reproductive mind. www.tfri.org

Construct	Motivational Constructs		
	Traits	Desire	Intention
Type of Constructs	Motivational disposition	Motivational state	Motivational state
Related Constructs	Attitudes, values, and testes	preferences, likes and ideals	Expectations and goals

Relationship with Consciousness	Non-conscious Self observation	Conscious Unconscious Subconscious	Conscious Unconscious
Relationship with External World	Situation stimulation of schema based affects that propels action	A wish to achieve an actionable goal	A decision-based commitment to pursue an actionable goal
How measured	Rate motives or feelings on multiple items: explicit Projective test: implicit Behaviour composite: implicit	Rate dimensions of desire for actionable goal	Rate dimensions of intention v implementation plan commitment, and plan implementation
Childbearing Dimension measured	Unit-polar positive Uni-polar negative	Bipolar: Uni-polar positive Uni-polar negative	Bipolar
Partner effects	None to moderate	Weak to strong	moderate to strong
Direct effect on behaviour	None to weak	None to moderate	None to strong
Effect on Fertility satisfaction	Mostly indirect Some direct	Mostly direct Some indirect	Mostly none Some direct

Not only DHS, but also studies from SSA and developed nations had used these terms interchangeable. A facility based survey in UK by Cliffe et al (2011:1093) and another study from developed country (Nostlinger 2013:251) used the terms one after the other to mean the same thing. There were also researchers from SSA (Dube et al 2012; Harrington et al 2012) that applied fertility desire to mean fertility intention.

As described by miller (1994 &1995), there is a clear difference in conceptual and operational definitions of fertility desire and intention. Oladapo et al (2005:1672) in

Nigeria and Loutfy et al (2009) in Canada used TDIB theoretical framework model to see the PLHIV's fertility desire and fertility intention. Even though the TDIB framework was not indicated to be applied in the studies of James et al (2001) and Finocchiaro-Kessler et al (2010) in USA, and Mmbage et al (2013:86) in Tanzania, they used the terms per the definitions given by Miller (1994:227). In Ethiopia Negash et al (2013) tried to show the sequence of DIB because they tried to see fertility desire and fertility intention and behavior as actions to get pregnancy. However, the full framework of TDIB was not applied to describe their whole study. Therefore, the researchers in this study wanted to determine both fertility desire and intention among PLHIV in Ethiopia as defined by Miller (1994 & 1995). In addition, it is also the aim of the researchers to see if factors affecting fertility desire and intention separately as this has got the practical application in counseling PLHIV at HIV clinic.

2.8 REPRODUCTIVE PREFERENCES AMONG PEOPLE LIVING WITH HIV/AIDS

2.8.1 Fertility Preference and Being Diagnosed with HIV Infection

Most HIV transmission in the globe is due to unsafe sex and associated with pregnancy, childbirth and breast feeding (UNAIDS 2012:16& 42). The majorities of PLHIV are of reproductive age and face challenging choices concerning their sexuality, parenthood desires and family life (Segurado and Paliva 2007:30). This is raising the need for sexual and reproductive health and HIV initiative to be mutually reinforcing (GNP+, ICW, Young Positives, Engender Health, IPPF, UNAIDS 2009:10). HIV counselling and testing (HCT) is an entry point to a comprehensive HIV care including ART. Knowledge about an individual's HIV status can assist health care workers to assist women in making decision on the number, spacing and timing of pregnancies, use of contraceptive methods and infant feeding (WHO/UNFPA 2006:1).

HIV infection affects the way women and men experience parenthood (Berer M. 2007). The negative impact HIV has on the ability to have a child is related to stigma and discrimination, decreased libido, the clinical impact of HIV infection and STI on fertility (Zaba B and Gregson S.1998:341-502; Glynn JR, Buve A, Carael M, et al.2000.345-52). Global HIV prevention effects thus must address SRH need of PLHIV (GNP+, ICW, Young Positives, Engender Health, IPPF, UNAIDS. 2009:10), as the majority of HIV infection occurs as a result of sexual

intercourse (UNAIDS 2012:16). Thus, it is human to acknowledge the need and aspiration of the basic right of expressing sexuality and the desire to experience parenthood irrespective of HIV status (UNAIDS 2006).

After HIV diagnosis PLHIV in African setting want to maintain partnership and procreation. They yet are challenged with stigma surrounding HIV. Usually, there is a mix opinion about acceptability of PLHIV having children, marriage and family. Qualitative study done in rural Tanzania by Ezakier et al (2012:1153) evidenced these issues. They pointed out that apart from having to grapple with potential stigma of not having children, PLHIV face social challenges in realizing their reproductive choices after HIV diagnosis. That is why a facility based study in six outpatient clinic in Demark has mentioned that 37% of the PLHIV felt that HIV infection was a hindrance to having more children (Laursen 2013:e851). Besides, there is a strong pressure from family member, people in the community and health care providers which make PLHIV to give up the idea of having a child (Cooper D, Harries J, Myer L, Orner P, Bracken H and Zweigenthal V 2007:274). This could be for the fear of risk of Mother to Child Transmission (MTCT), effect of orphanage, associated HIV infection with increased risk of miscarriage, pre-tem deliveries, low birth weight (The World Bank 2010:8).

Due to these reasons a lot of studies show that PLHIV want to limit their fertility. For example, an assessment done using the DHS of Zabmbia, Swaziland, Zibmabew and Lesetho have shown that knowledge of one's own HIV positive status is significantly associated with a desire to limit childbearing (Johnson KB, Akwara P, Shea O, Rutstein SO and Bernstein S 2009:S7). A comparative and cross-sectional study in Uganda by Heys J, Kipp W, Jhanqri GS, Alibhai A, Rubaale T (2009: S3) have indicated that odds of wanting to stop childbearing was found to be 6.25 times greater ($p < 0.01$) for HIV+ve than HIV-ve. Elul B, Delvaux T, Munyana E, Lahuerta M, Horowitz D, Ndagije F Roberfroid D, Mugisha V, Nash D and Asiiimwe A (2009:S29) also indicated that HIV +ve women were less likely to report wanting additional children as compared to the HIV-ve ones (8% versus 4 %). A study done among the general population in Ethiopia non-disaggregated by HIV status has shown that 47 % of currently married women wanted no more children (Dibaba Y 2008:28).

On the other hand, marriage and having a child is a central role in the social identity of both men and women. Thus, every corner of the world HIV status doesn't depress fertility desire of PLHIV. Also pregnancy may be a time of high self-esteem for women to dehumanize the effect of living with HIV. That is why PLHIV both from developing and developed nations report that they want to have a child or another in the future. Thus, there is a need to recognize that PLHIV enters into relationships and bear children irrespective of those challenges (The Global Network of PLHIV/AIDS (GNP+) 2009). That is why many researchers have found out that there is strong need for childbearing after HIV diagnosis. Tesfaye et al (2012:27) from Ethiopia have shown that 85 (49.71%) of males and 79 (36.3 %) of females living with HIV in the chronic HIV follow up expressed the desire for children with a total of 164(42.16 %) of all participants. A community based rural study in Tanzania by Mmbaga EJ, Leyna GH, Ezekiel MJ and Kakoko DC (2013:86) has also revealed that an overall fertility desire among PLHIV was 37.1% (152); 39.7 % of males and 35.6 % of females.

2.8.2 Fertility Desire and Intention of PLHIV and Stages of HIV Epidemics

Pregnancy planning study is an important component of Chronic HIV care. It is important to understand fertility desire and intention of current generation of PLHIV in order to develop programs to support them and in planning future pregnancies that protect the health of their partner and their children (Wekesa & Coast 2014:e106392).

Studies done both in SSA early in HIV epidemic revealed that HIV infection was associated with about 20%-40% reduction in fertility (Zaba and Gregson 1998:S41). There were biological, social and health reasons as to why HIV decreased desire for children during early HIV epidemic when opportunistic infections had been affecting peoples (Barbara Nattabi et al 2009:949). PLHIV with different kinds of opportunistic infections could not be sexually active, get married, or could do commit marital separation. This again could lead to a decreased fertility. Therefore there could be a depressed fertility need, yet no complete absent need of childbearing (Chen et al 2001:151; Cooper et al 2009:38; Myer et al 2007:278).

When the HIV pandemic in the developing nations matures, the majority of the affected individuals, especially 80% of all women living with HIV and their partner, are in their reproductive years (UNAIDS, 2012:28). In common with those not infected, they are expected

to bear and raise children (Nakayiwa et al 2006: s95 and Gray et al 1998:98). These days the number of pregnancies among PLHIV is increasing which is proxy indicator of increased fertility desire (Berhan and Berhan 2013:7). The researches in this study wanted to know the status of fertility desire and intention during the maturing time of HIV pandemic in Ethiopia.

2.8.3 Fertility Desire, Intention and duration after HIV diagnosis

A mixed study done by Keogh et al (2012:39) in Kenya to see the impact of ANC HIV diagnosis on postpartum childbearing indicates that HIV diagnosis was associated with a long-term demand adjusted in childbearing desire, but not with changes in short term post-partum desire. A survey done in UK by Cliffe et al (2010:1093) revealed that there is a change in fertility intention in the period after HIV diagnosis. Accordingly, 75% of the participants reported that they wanted children. Forty-five percent said that HIV diagnosis does not affect their fertility intention. About one-third of the women decided they no long wanted children after HIV diagnosis, but 41% of these had changed their mind following advance in HIV management and treatment. Both of these studies have shown that through time, after HIV diagnosis, there is a change in the fertility desire and intention. These studies are not the longitudinal researches to show the real fertility change with time. They have, however, given the clue of the change in fertility desire and intention with time after HIV diagnosis. This is well evidenced by a longitudinal study in Ugandan (Kakaire et al 2010:2) among men and women living with HIV having care at Kabale which shows that 28.6 % of the respondents reported they would like to have a child and more than 17 % of them had produced a child since HIV diagnosis.

On the contrary a South African research (Kaida et al 2011:350) has found out that there is no association between duration of HIV diagnosis. The change in fertility desire and intention is having during different durations after HIV diagnosis is thus worth looked in to in this study in Southern part of Ethiopia.

2.8.4 Anti-retroviral Treatment, Prevention of Mother to Child Transmission and fertility Desire and Intention among PLHIV

Fertility desire and intention studies were carried out during the early phase and peak periods of the HIV epidemic. Most of them showed that fertility desire of PLHIV was lower than the general population and rather knowledge of HIV positive status is associated with increased in the reported desire to cease childbearing

(Dube et al 2012: e51861). With ART becoming increasingly available across Africa, both fecundity and fertility desires among HIV+ve women have rebounded (Meyer L 2010). This is especially so in the SSA context where a high premium continues to be placed on fertility and parenthood for social approval (Cooper D, Harries J, Myer L, Orner P, Bracken H and Zweigenthal V 2007:274).

The use of ART substantially reduces transmission not only between sexual partners (Crepaz N, Hart TA and Marks G. 2004:224) but also the probability of peri-natal transmission to below 2% (Boonstra H 2006:1). ART and Prevention of Mother to Child Transmission (PMTCT) programmes have the potential to influence fertility desires. This is because these medical interventions will allow PLHIV to have normal sexual lives and potentially HIV-free children (Cooper et al. 2007:274). Enhanced access to ART enables HIV positive women to better express and realize their sexual and reproductive desires and rights (Cooper et al 2009; Homsy et al 2009; Kanniappan et al 2008; Oosterhoff et al 2008a).

According to the studies in South Africa (Cooper et al 2009:), Uganda (Maier et al 2009:28), Brazil (Nobrega 2007:261) and India (Kanniappan 2008:625) there is a positive association between fertility desire of PLHIV and ART. A facility based cross sectional study in Ethiopia states that there is an increased fertility desire after ART (Tesfaye and Admasu 2012:20). Besides, cited in a cross-sectional study in Swaziland by Panozsoa L, Battegayb M, Friedlc A, Pietro L, and Vernazzaa PL (2003:124) individuals who experienced improved health while on ART were more likely to express a desire for parenthood. This is because early in HIV epidemic when the services of ART and PMTCT were availed the health status of PLHIV started to improve. This may renew interest in sexual relation and desire to have children for men and women living with HIV (Degu G, Yimer G, Berhane Y, et al 2006). Oladapo et al in Nigeria (2005:1672) have specifically indicated that a shorter time since treatment of HIV infection was significantly increases the odds of desire for childbearing. Schwtz et al (2010:69) has also reported that recent ART initiation is associated with increased odds of fertility intention.

On the other hand, studies done in the last half a decade have come up with the fact that there is no association between ART and fertility desire (Aska et al 2011:198;

Berhan and Berhan 2013:1; Kakaire et al 2012:2). Kaida et al (2011:350) from South Africa also indicate that desire for fertility is not related to ART use. There were a lot of stipulated reasons for this. Firstly, in the expansion of ART service, PLHIV know that ART can have an effect on the regain of sexual activity and think that they can have children whenever they need. Secondly, those who have not yet started HAART know that they can start ART and regain their reproductive desire. This is exemplified by the review of Berhan and Berhan (2013:1) where they showed that the absence of relationship between ART and fertility desire is explained by other non-ART associated factors which determines the reproductive decision making of PLHIV. These are; socio-demographic, cultural, economic and health status of PLHIV.

A cohort study done in USA by Stanwood et al (2007:353-54) shows there is reduction in fertility desire after ART. Another facility based and cross sectional study done in Uganda among both HIV positive and negative reproductive age of females showed that despite high fertility norms in Uganda and almost universal use of ART in the sample, HIV+ women were significantly less likely to desire future childbearing relative to HIV- women (Snow et al 2010:2).

When this study was conducted in Ethiopia, much had been performed regarding HIV prevention and control (FMOH 2012). The peak HIV prevalence in Ethiopia was 12.5% during 1995-2002 and started to decline slowly to reach 1.3% in 2011 (CSA 2012). That is HIV program is getting matured. According to the 2012 FMOH national HIV progress report ART coverage is 80% (FMOH 2012:32). Therefore, late in the decentralization and expansion of HAART and PMTCT programs the change in the fertility desire and intention of PLHIV is in need to be looked into in Ethiopia (FMOH 2012:32). The researchers thus wanted to explore the change in fertility desire and intention of PLHIV in Ethiopia after the HIV program became matured and HIV prevalence and incidence has remarkably declined. A few of the recent studies were done in Ethiopia during ART decentralization and expansion (Negash et al 2012:1) and yet there were few of researches conducted in the Southern region of the country to see the change in fertility desire and intention among PLHIV after much interventions were done in the region.

2.8.5 What are the reasons for fertility preference of PLHIV?

Cooper et al (2009) has explored extensively on the reasons for fertility intention. Health status, wanting at least one child, lost child to HIV/AIDS, sufficient financial means, pressure from partner were the commonly cited reason to intend for childbearing. The female participants in this facility-based cross-sectional study deterred to future childbearing for fear of deteriorating health after pregnancy. However, male participants mentioned non-HIV associated reasons like insufficient income, and enough children before as common reasons to defer having children. In addition, a qualitative study in Kenya identified that fear of premature death, financial hardship and perinatal HIV transmission as a reason to cease or delay childbearing (Harrington et al 2012). Aska ML, Chompikul J, and Keiwkarnka B (2011:198) note medical concerns were reasons for not having a birth and social and culture related issue were reported to be a reason for a desire to have a birth. To determine the reasons for future childbearing is paramount important in designing intervention at chronic HIV clinic to assist PLHIV to have or not to have children. Few studies in Ethiopia, specifically in Southern region of Ethiopia, have explored the reason for having or avoiding pregnancies. Trial was therefore made to look into the possible reasons mentioned by the study partners for saying that they desire or not desire childbearing.

Besides, these studies however hardly looked into the actions taken for the intention of pregnancy. The action to have or to avoid childbearing has been well looked into in fertility intention studies like in Canada study using TDIB (Ioutfy et al 2009). A cross-sectional study in Malawi among HIV positive and HIV negative 1766 monogamous married couples has pointed out that though significant HIV positive want to limit childbearing there was limited evidence this desire lead to higher use of contraception (Dube et al 2012:e51861). A qualitative study in South Africa (Matthews 2013:46) has showed that PLHIV rarely know how to reduce what to do to reduce HIV transmission while trying to get pregnant. Also a study at two teaching hospitals in Ethiopia among PLHIV has tried to see actions taken by PLHIV to get pregnant. In this study 271 had taken an action and were pregnant. For the actions were not well explored the researchers has suggested other similar studies for further possible actioned to be well explored (Negash et al 2013: 1).

According to TDIB theoretical model (Miller 1995) the 'B' part is the behavior or action of those who desire or intend for pregnancy. Yet, TDIB was hardly used in Ethiopian study to see the 'B' part of fertility desire and intention. Thus it is essential to find out those actions after a lot of interventions have been taken place in Ethiopia to prevent and control HIV (FMOH 2012:31). In this study actions taken by PLHIV to have or to avoid pregnancy were also tried to be described. This is due to the fact that action so far taken to have or to avoid pregnancy by PLHIV is an important to design strategy in SRH program to support PLHIV.

2.8.6 Who Else Desires and Intends Fertility among PLHIV? Other Factors That Affect Fertility Desires and Intentions among PLWHA

Evidences have shown that the fertility intentions of women are influenced by various demographic, socioeconomic and program factors. Demographic factors that influence fertility desire among PLHIV include age, gender and number of living children. Socio-cultural factors that affect fertility desire among PLHIV include cultural norms and values about parenthood, social support, and disclosure of status. Health-related factors that affect future fertility among PLHIV apart from ART use include subjective health status (Nattabi et al 2009; UNAIDS 2008).

2.8.7 Fertility Desire, Intention and Age

HIV is a disease of the younger age population. In SSA 15-24 years of age is the commonly affected age group. This is specifically higher for young females where more than 60% of HIV infected PLHIV are younger females (USAID 2008). The pattern is similar in Ethiopia where the high proportion of HIV infected people are those with younger age group, 15-24 years old (FMOH 2012). The challenge with this age group is that fertility desire and intention is higher. A lot of evidences from developed countries (Nostlinger 2013:251; Stanwood et al 2007:350) and developing nations (Aska et al 2011:198; Heys et al 2009:S3; Oladapo et al 2005) have revealed that younger age in both sex is associated with the desire for future childbearing. In addition, studies in Ethiopia (Dibaba 2008:28; Tamene and Fantahun (2007:224-226) and data from 2011 EDHS (CSA 2012) show that younger age is a predictor of fertility desire. Younger PLHIV is thus more likely to desire and intend fertility. Their high-risk sexual behaviour is also the dominant mode of HIV transmission among the young PLHIV. However, there are few

evaluations of interventions targeting HIV positive young people (Delavaux and Nostlinger 2007:46).

A mixed study design in Kenya among the Nairobi slum (Mekesa and Coast 2014:1) indicates that younger age, fertility desire, the risk of HIV transmission and issue of unintended pregnancy (UIP) are the complex and ambivalent part of SRH. On one hand, the young PLHIVs are sexually active with high desire to start sexual relation and have children (Kakaire et al 2010:2). On the other hand, HIV is a disease which is being transmitted through unsafe sex. Above all, there is a pressure from society and cultural effect of exercising parenthood. A pressure from HCWs not to have a child after being HIV infected and fear of having HIV infected children are also tensions to young PLHIV (Nostlinger 2012: 251).

These all makes younger age group and reproductive desire complex and ambivalent (Mekesa and Costa 2104:1). In this study the possible association of age with both fertility desire and intention tried to be determined in the period when HIV prevalence among younger in Ethiopia has become reduced to 1.3% in 2012 to 12.5% in late 1990th (FMOH 2012).

2.8.8 Influence of Gender Difference on Fertility Desire and Intention

While desire for pregnancy has been shown to outweigh concerns about horizontal transmission (van Leeuwen et al 2008:456-58), a woman's desire can also be affected by the status of her partner. This is because in many part of developing countries men often prefer larger families than women (Population Report 2004). Thus, men, spouses of the females, continue to desire fatherhood in the presence of HIV (Cooper et al 2009:38; Paiva et al 2003:91; Paiva et al 2007:268; Sherr (2010:2-3; Sherr and Barry 2004:258). For instance, the desire to have children among people of Brazilian living with HIV is more frequent among men than among women (Paiva V. 2007:70). Also cited by Myer L, Morroni C, and Rebe K (2007:278) men also desire to have child in the future more than the females. A facility based comparative cross-sectional study in both male and female PLHIV on chronic HIV care in the northern part of Ethiopia have shown that partner fertility decision to have a child and having an HIV negative partner are associated with current decision to have a child (Getachew M, Alemseged F, Abera M & Deribew A 2010:215).

A lot of studies in SSA have shown that there is great influence of gender on reproductive decision making of PLHIV. SSA is a male dominated society where male gender has got a great influence on fertility decision especially on the number of children in a family (Harries et al 2007:282). Most African culture put a responsibility on the male to continue the lineage. Male usually wants to have a lot of children. This is because they want their name and inheritance to pass through the next generation.

According to the study by Cooper et al (2009:S38) male desires future childbearing more than females. Alemayehu & Aregay (2012:130-31) also show that fertility desire is related to male gender. A cross sectional study in Papua guinea among 291 HIV positive women in the male dominant population showed that 34% of them would like to have a child in the future (Aska et al 2011:198). A Ugandan study by Heys the colloquies (2009:S3) have shown that female was an independent predictors to stop childbearing.

However, studies in UK (Cliffe et al 2011:1093), and Ethiopia (Negash et al 2013:1) showed that fertility desire is associated with female gender. The culture and economic status of these studies settings is in fact different from that of other studies settings in SSA. In developed countries where female has to stay in school longer and where there are high aged populations, females wanted to have children. On top of that these are population with low fertility rate.

Though fertility rate has been declining in Ethiopia (CSA 2012) male still shows high need of childbirth (CSA 2012). Gender influence has got an application on the SRH at HIV clinic during counseling. Therefore, it is the interest of the researchers to see how gender difference could lead to the difference in fertility desire and intention in Ethiopia specifically in Southern Ethiopia where there were only few studies which explored influence of gender on fertility decision making.

2.8.9 Fertility Desire and Intention and Area of Resident

DHS performed in Ethiopia so far has shown that there is a big difference in total fertility rate between rural and urban residents The current total fertility rate is 4.8% (2.6% in urban and 5.5% in rural) (CSA 2012:69). However, these DHS were not disaggregated with HIV status. A study in Ethiopia by Tamiru et al (2012:380-81) state that 47% of

rural population and 89.9% of rural females did not want any more children. Few studies however have indicated that the difference of fertility desire with residential area of PLHIV in Southern Ethiopia. It is the intent of the researchers to see if the residential area of PLHIV affects the childbearing desire in Southern Ethiopia. This is because rural and urban Ethiopia has got different cultural, education and economic stats as well.

2.8.10 Fertility Desire, Intention and Number of Children Owned

A value of having a lot of children in Africa is there for long. Nevertheless, whether having a lot of children in era of HIV especially after the advance of ART among PLHIV is not an easy decision. This is because HIV could not eliminate the fertility decision making of PLHIV (Cooper 2009:S38) though there is a sign of decline in the number of fertility intended after HIV infection (Berhan and Berhan 2013:6).

Evidences have shown that there is strong relationship between number of children owned and future fertility desire. For instance, study done in Papawguinea (Aska et al 2011:198), Tanzania (Mmbaga et al 2013:86), Nigeria (Oladapo 2005:1672), Uganda (Heys et al 2009:S3), Kakaire et al (2011:2), Malawi (Dube et al 2012:e51861), South Africa (Cooper et al 2009: S38), Ethiopia (Negash et al 2013:1; Tamene and Fantahun 2007:224-226) and also in Europe (Cliffe et al 2011:1093, Nostlinger 2013: 215) have shown that there is strong and negative association between fertility desire and intention and the number of live children. Dibaba (2008:28) have stated that life time risk of not having live births and number of live children are the most important predictor of fertility. That is the higher the number of live children owned by PLHIV the less likely they desire or intend for future childbearing (Tesfaye et al 2012:30). Specifically Harrington EK, Newmann SJ, Onono M, Schwartz KD, Bukusi EA, Cohen CR, and Grossman D (2012:1) have found out that having no children significantly increases the odds of intention to have 3 or more children in comparison to 1-2 children. Yet, a cross-sectional study in Nigeria done using the TDIB model computed that 147(63.3%) of the participants expressed the desire for children though 50.4% of them already had 2 or more children (Oladapo et al 2005).

As could be noted most of these studies have looked at either the number of live children owned as a whole or the number of children after HIV infection. Yet they barely

tried to explicitly see if total birth experienced as a whole, after HIV diagnosis or after ART initiation could have similar or different effect on the future child desire and intention of PLHIV. So this is the interest of the researchers to see if total birth experience, birth experience after HIV diagnosis and number of births after ART service initiation could be associated with fertility desire and intention.

2.8.11 Being in Relationship as Affecting Fertility Decision Making Among PLHIV

Maintaining a relationship is challenging issue among PLHIV (Hailemariam et al 2012:1). It is pronounced and troublesome when one partner is HIV negative (discordance). This is because managing their sexual desire is not an easy in HIV prevention endeavor. A cohort study among HIV positive women by Stanwood et al (2007:350) show having relationship duration of less than 2 years is positively associated with future childbearing. Therefore, it is critical to see fertility desire and intention of HIV positive discordance and concordance couples in context of different length of relationship.

The grounded study done in Addis Ababa by Hailemariam et al (2012:1) has stated that couples pass through a social process of struggle to maintain a relationship. They try to maintain relationship because of the need of childbearing though there are mismatch of desire to have children, controversy of safer sex versus desire to have a child and undesirable change in sexual desire and practice through time. Currently cohabiting with a partner is shown by Ask et al (2011:198) and Mmbaga et al (2013:86) to have a positive association with a desire to have a child. A study in developed countries (Cliffe et al 2011:1) has also indicated that being in relationship is one of the factors which were positively associated with fertility intention fuelling the advanced HIV management and treatment. A Tanzanian study (Mmbaga et al 2013:86) has found that being divorced or separated was negative predictor of the wish for future childbearing. Tamene and Fantahun (2007:224-226) from Ethiopia has also indicated that in comparison to those participants who said they didn't desire to have children, those who did desire children tend to be in relationship or were married (Adjusted Odds Ratio (AOR): 3.4, 95% CI: 2.1–5.6).

Nevertheless, the pattern of fertility desire and intention with duration in relationship, after HIV diagnosis and after ART initiation are hardly explored by these studies.

Findings of Aska et al (2011:198) and Cliffe et al (2011:1093) have shown that there is a change in fertility desire and intention along the duration in relationship after HIV diagnosis. A mixed study design among 75 men and 127 women being in relationship after HIV diagnosis at least 2 years were associated with increased odds of fertility desire (Kawale 2014:769). This might have a practical implication as to whom to counsel and what to counsel in those PLHIV in need of childbearing during different duration in relationship, especially in the periods after HIV diagnosis and ART initiation. This is because duration in relationship after HIV diagnosis and ART initiation is an eminent risk for fertility desire (Hailemariam et al 2012:1).

The researchers in this study wanted not only to see how being in relationship influences the fertility preference of PLHIV in southern Ethiopia but it is also their aim to look at how total duration in relationship, duration in relationship after HIV diagnosis and ART initiation are related with fertility desire and intention.

2.8.12 Childbearing Decision among Discordant and Concordant Couples in PLHIV: Disclosure and Knowledge of HIV Status of Once Partner

HIV + concordant couples should be advised to use barrier methods especially condom to prevent the possible re-infection with another strain of HIV virus. When they desire and intend to have a birth, they should not exercise unsafe sex. So they should be counselled to attempt conception at fertile time of menstrual cycle (WHO/UNFPA 2006:25).

More challenge arises when sero-discordant couples need to conceive especially when the male is HIV infected. Options like artificial reproductive technique or adoption should be discussed (WHO/UNFPA 2006:25). The pity is that high-tech reproductive experience like sperm insemination are limited in resource constrained settings including Ethiopia.

Where HIV positive partner fail to disclose their status to their HIV negative or untested partner, unprotected sex was more likely. Thus, ensuring disclosure and knowing once partner HIV status is one way to prevent HIV transmission and create awareness about HIV prevention strategies (FMOH 2012).

A lot of studies have shown that disclosure of HIV status and knowing once partner HIV status has an association with fertility desire and intention (Keida et al 2013; Oladapo et al 2005:1676). A cross-sectional study by Dube et al (2012:e51861) found out that knowledge of HIV status is associated with an increased in the reported desire to cease childbearing. The author thus recommended assisting HIV positive couples to access and using SRH service and limit HIV transmission. A rural study in Tanzania (Mmbaga et al 2013: 86) and in Ethiopia (Alemayehu and Aregay 2012:130-31) have indicated that disclosing HIV status was positively associated with fertility desire. However, Kaida et al (2011:350) have shown that there is no association between future childbearing need and disclosure of HIV status. The latter is the study which involved both HIV positive and negative women which can have different opinion regarding the disclosure of once HIV status.

The Researchers have also aimed to see how knowledge of once partner HIV status and disclosure are related to fertility decision making in Southern Ethiopia. This is because the study was conducted after lot of interventions had been taken place to increase people awareness regarding HIV (FMOH 2012:25-32).

2.8.13 Partner and Partner communication: partner Role in Fertility Decision-making among People with HIV

The effect of partner on fertility desire and intention has been shown by different researchers both in developed and developing countries. Aska et al (2011:198), Tamene and Fantahun (2007:224-226) have shown that fertility intention is associated with participants with a partner who also desired to have children. Nagash et al (2012:1) in Ethiopia have also indicated that fertility desire of the partners study participants has strong and independent predictor of fertility desire.

Though partners desire influences once future fertility desire; however, there noted a low communication in the study of cooper et al (2009:1). Evidences have also shown that the discussion at HIV clinic involving both partners regarding sexual and reproductive need is critical in reducing HIV transmission (Finocchario-Kessler et al 2010:317). How Health Care Workers (HCW) and partner communicated to study participants? This is an area in need to be explored in this study using TDIB framework.

2.8.14 Use of Family Planning and Fertility Preferences among PLHIV

Not only the influence of partner fertility desire is seen in this study it is also the interest of the researchers to see if the use of contraceptive either by the partner or the participants could have associated with their fertility desire and intention.

More than two third of PLHIV made up by women (UNAIDS 2006), though the evidence as to what extent or type of contraceptive used by them is limited. Family planning use among PLHIV has considerable population and public health benefits. In addition to reducing unwanted pregnancies, family planning can help PLHIV to prevent the transmission of HIV to sexual partners and children. In 2010, 63% of women aged 15–49 years who were married or in a consensual union were using some form of contraception (WHO 2013). Per the WHO's Medical Eligibility Criteria for contraceptive Use, most contraceptive methods are considered to be safe and effective for HIV positive women, both with asymptomatic and symptomatic HIV and AIDS (WHO 2004).

Evidences of WHO have shown that there are no restriction on the use of any form of contraceptive by PLHIV including those who are on ART except the fact that rifampin may decrease the effectiveness of oral contraceptive due to the interaction with oestrogen where the consistent use of condom is warranted (WHO, 2006). Caution has to be taken for PLHIV at risk of other STIs and pelvic inflammatory diseases (PID) (Steen and Shapiro 2004:136-43) while advising for Intra-Uterine Contraceptive Device (IUCDs). Yet IUCDs can be used in case of HIV infection, except for women with AIDS and those not on ART (WHO 2006). To say in a sentence, there is evidence that provision of contraception is a more cost-effective approach than use of antiretroviral prophylaxis in preventing vertical transmission (Daniel, Stover and Reynolds 2009:S123), and so should be an important component of PMTCT (Elul et al 2009:S19).

PMTCT evaluation studies carried out in Kenya and Zambia has shown that HIV positive women had similar contraceptive use rates to HIV negative women. The higher proportion of HIV positive women were using contraceptive in Dominican Republic and Thailand than in African sites (Rutenberg and Baek 2004).

However, Dube et al (2012:e51861) showed that though a high proportion of HIV infected monogamous couples wanted to limit children, there was no evidence that they were using family planning. Besides, MTCT is also related with low use of contraceptive, low institutional deliveries and high unintended pregnancies in Ethiopia (FMOH 2012). There is also reproductive dilemma for PLHIV unprotected sexual activity not only carries a risk of sexual HIV transmission and vertical HIV transmission, but also it could expose PLHIV for risks during childbirth and unintended pregnancies. Therefore, there should be a mechanism or an intervention which supports PLHIV who wants to avoid pregnancies as well as those who wanted to get pregnant. This is due to the fact that many PLHIV continue to become sexually active and still show strong desire for biological children (Cooper et al 2007; Myer et al 2007). Thus, contraceptive use among PLHIV is critical in prevention of MTCT of HIV and to avoid unintended pregnancies.

Once knowledge on the magnitude of commonly used contraceptive and its effective in the future decision of childbearing is important because the availability of and use of modern technologies such as sperm-washing and other assisted conception methods enabling to have HIV free child is not common in developing countries including Ethiopia though shown to be effective in Westerns (Lois et al 2007:1909).

Therefore, can current use of family planning have an association with the future decision of fertility desire or intention among PLHIV? This is also another area of interest in this study as Prong-II of PMTCT in Ethiopia is at infancy stage (FMOH 2012:24). Moreover the aforementioned studies failed to identify use of family planning as an action taken to limit childbirth. It is also the interest in this research to see if the use of family planning is one of action taken by PLHIV to avoid pregnancy.

2.8.14.1 Condom Use and Dual Protection in PLHIV

When used consistently and correctly, male condoms are the most effective means to prevent sexual transmission of HIV (Weller and David 2002). Four meta-analysis of condom effectiveness put the range at 69-94% (UNAIDS 2004). That is why promotions of condom use in Africa and Asia have led to increased condom use, mainly in commercial and casual sex.

The level of condom use are lower as the degree of intimacy and stability of the relationship is greater, however (Delavaux and Nostlinger 2007:53).

Male condom is the contraceptive method most frequently used by people living with HIV (Degu et al 2006). This is also indicated by study done in Uganda where ever use of condom was reported to be 47% (McClellana, MK, Patelb, R, Kadzirangec,G, Chipatod,T and Katzensteine, D 2010:30).

Dual protection is a protection against both unwanted pregnancy and STIs (WHO 2000). It also refers to the use of male or female condoms with a more reliable contraceptive such as the pill. Easy access to emergency contraception if a condom breaks also reduces the risk of unintended pregnancy. Condoms are the main stay of dual protection alone or in combination with another method(s). Much of the effectiveness of dual contraceptive against unwanted pregnancy will be dependent on another contraceptive method being used because men's usually dislike to use condom and sexually active people are unwilling to use condom all the time (Delavaux and Nostlinger 2007:56).

2.8.14.2 Unmet and Met Need for Family Planning

Women who say they are not using contraception and who say either that they do not want any more children or that they want to wait two or more years before having another child are considered to have an unmet need for family planning. Conversely, women using a family planning method are said to have a met need for family planning. Both unmet need and met need can be categorized as such based on whether the need is for spacing or limiting births. The combination of women with unmet need and women with met need for family planning constitutes the total demand for family planning (Delavaux and Nostlinger 2007:56; WHO 2000).

Unmet need of reproductive health among PLHIV is still a challenge in developing countries. For instance, a recent study done in Kenya among 13, 583 respondents both in HIV positive and HIV negative women, it is reported that a significant proportion of them tried to limit children (58%). Yet, only 69% of them were using contraceptive. According to the authors this heralds the high unmet need of family planning for HIV positive women threatening MTCT and unintended pregnancy (Ngugi et al 2014:575). In

addition, a qualitative study in USA among young women also found out that young women with HIV infection had unmet need for family planning service (Robinson 2014: 135). Yet a study in Papua Guinea (Aska et al 2011:198) indicates that the current use of contraceptive was related to a decision of future childbirth. Therefore, looking into the contraceptive use among PLHIV without a desire or intention of childbearing is another area of focus this study.

2.9 CONCLUSION

Through a detailed literature review using different search mechanisms such as scholar Google, PubMed and UNISA library the researchers have managed to clearly define what are the research gaps regarding the fertility preference of PLHIV in Ethiopia. It was learnt that the use of TDIB to explicitly define and look at the magnitude of the concepts fertility desire and intention among PLHIV is critical. This study tried to define the concepts in southern Ethiopia among 460 PLHIV attending chronic HIV clinic. These two concepts were interchangeable use by different researchers and authors. Factors in need to be described and analysed further were also identified in this literature review. This is a study which was conducted during the verge of ART and PMTCT service expansion in Ethiopia. Thus trial was made to look into journals which have been published after the expansion of ART program both in developing and developed nations. The change in fertility desire and intentions as well as determinates were entertained in the literature review.

In short it was found out that the TDIB theory, initially described by Miller, clearly explains the difference between these two concepts. Thus, the TDIB theoretical frame work is used to structure the whole study starting from problem identification, objective setting, data analysis and interpretation.

Though there are controversies, the need for future fertility is yet reported after ART initiation as well. In fact, this is a conception for this study to see the situation in Ethiopia. This nation is also a victim of all the complications of SRH and HIV/AIDS though the ART program is relatively getting matured.

The impact HIV had on fertility individually and societal was also appreciated specifically in southern part of the continent where HIV/AIDS is highly prevalent. This is an area of male

dominated decision making society and a high culturally valued parenthood which is again challenged by the HIV epidemic and fear of MTCT of HIV. Ethiopia, as part of this type of population in SSA, is sharing same scenario where a fertility desire and intention as well as factors associated with need to be explored. To accomplish this, researchers have used a valid and reliable research design and methodology described in the next chapter.

CHAPTER 3

RESEARCH DESIGN AND METHOD

3.1 INTRODUCTION

This chapter deals with the details of research design, including the paradigm and the methodology. The section describes the quantitative paradigm which is related with positivist tradition. The researchers also explore the study setting, study population, sampling method and enrolment procedures. The development, characteristic, structure, approach, procedure of data collection and challenges faced during data collection is given due attention. Pilot study is presented as one of the means to measurement validity and reliability. The chapter also includes ethical issues considered during sampling and data collection. At end, the methods of securing internal and external validity of the research are discussed together with the procedures of data management and analysis.

3.2 RESEARCH DESIGN

3.2.1 Research Paradigm

As stated in chapter one this study was based on the quantitative research paradigm which is related to positivist tradition. Burns & Grove (2005: 23) stated quantitative research as: "... a formal, objective, and systematic process in which numerical data are used to obtain information about the world". Thus, in this study a quantitative paradigm is followed to generate a quantifiable data about fertility desire and fertility intention. The quantitative paradigm is chosen because it describes and examines relationships between variables (Burns & Grove 2005:23). In this particular study the dependent variables, fertility desire and intentions, are described. The relationship these variables would have with socio-demographic, HIV related factors, fertility and partners' characteristics are also examined. According to Polit & Beck (2008:16), quantitative research gathers empirical evidence which is based on objective reality and is collected directly or indirectly through empirical observation. The objective of the study is not to explore human experience through non-objective observation or

not to describe the life experience in the past, a case in qualitative research paradigm. Rather, it is to quantify the prevalence of females and males who will have fertility desire and intention.

Quantitative research uses structured interview, questionnaires, scales or physiologic instruments that generate numerical data (Burns and Grove 2005:24). In this study, questionnaire was developed and used to collect numerical data. According to Polit and Beck (2008:18), these numerical data collected by structured data collection instruments are statistically analyzed.

Cited by Polit and Beck (2008:16), quantitative research is interested in factors influencing a certain event. In the fertility desire and intention study, it is also aimed to examine how fertility desire and intention is being affected by socio-demographic, HIV infection & ART initiation status, family planning and fertility related factors. Generalizability where a finding in certain research is extrapolated to individuals other than the study participants is peculiar to quantitative research paradigm. In this study, the finding could be extended to other HIV positive individuals on chronic HIV care in Ethiopia based on the reliability and validity of the study.

3.2.2. Study Design

Burns and Grove (2005: 211) describe a research design as "... a blueprint for conducting the study that maximizes control over factors that could interfere with the validity of the findings". A research design is also defined as a comprehensive plan to answer research question. It is a strategy adapted to develop accurate and meaningful evidence as well (Polit and Beck 2008: 203).

The non-experimental or observational, analytical and cross-sectional study design was utilized to carry out this study. According to Bonita & Beaglehole (2006:40), observational studies allow nature to take its course. The researchers only observe, describe and document aspects of a phenomenon as it naturally occurs (Burn's and Grove 2005: 219). The fertility desire and intention study is analytical as the aim is to examine the association between fertility desire or intention and other socio-demographic and HIV related factors (Bonital & Beaglehole 2006:41).

The study was preferred to be a cross-sectional because the measurement of exposure and effect is at the same time (Bonita and Beaglehole 2006:44). There was a simultaneous detection of the magnitude of fertility desire and intention, and associated factors. In this research, both the exposure, such as partner characteristics and the outcome, fertility desire, are present in the study subjects for quite some time, one and half months. Cross-sectional study helps a lot to find out factors associated with the study outcome (Carloson and Morrison 2009:77). In this study socio-demographic, HIV/ART associated and other factors were tried to be computed whether they are related to the outcome variables, fertility desire and intention.

In a cross sectional design, valid primary data is collected using well designed and structured questionnaire with adequate sample size. In fertility desire and intention study, structured and pre-tested questionnaire was prepared and used to collect data from respondents (Joubert & Ehrlich 2007:106). A primary data was collected and used in this study. Yet it is time consuming and expensive to collect a primary data as compared to collecting secondary data (Carloson and Morrison 2009:78).

3.3 RESEARCH METHODS

Cited in Burns and Grove (2005:34), quantitative methodology involves objective and systematic measurement of data from patients and utilizing such information to describe variables and analyze their relationships. In this section, the methods are outlined by referring to sample selection, data collection, data management and data analysis. Design validity and the ethical considerations of the study are discussed in detail at the end of the chapter.

3.3.1 Population and Sample Collection

3.3.1.1 Study Setting

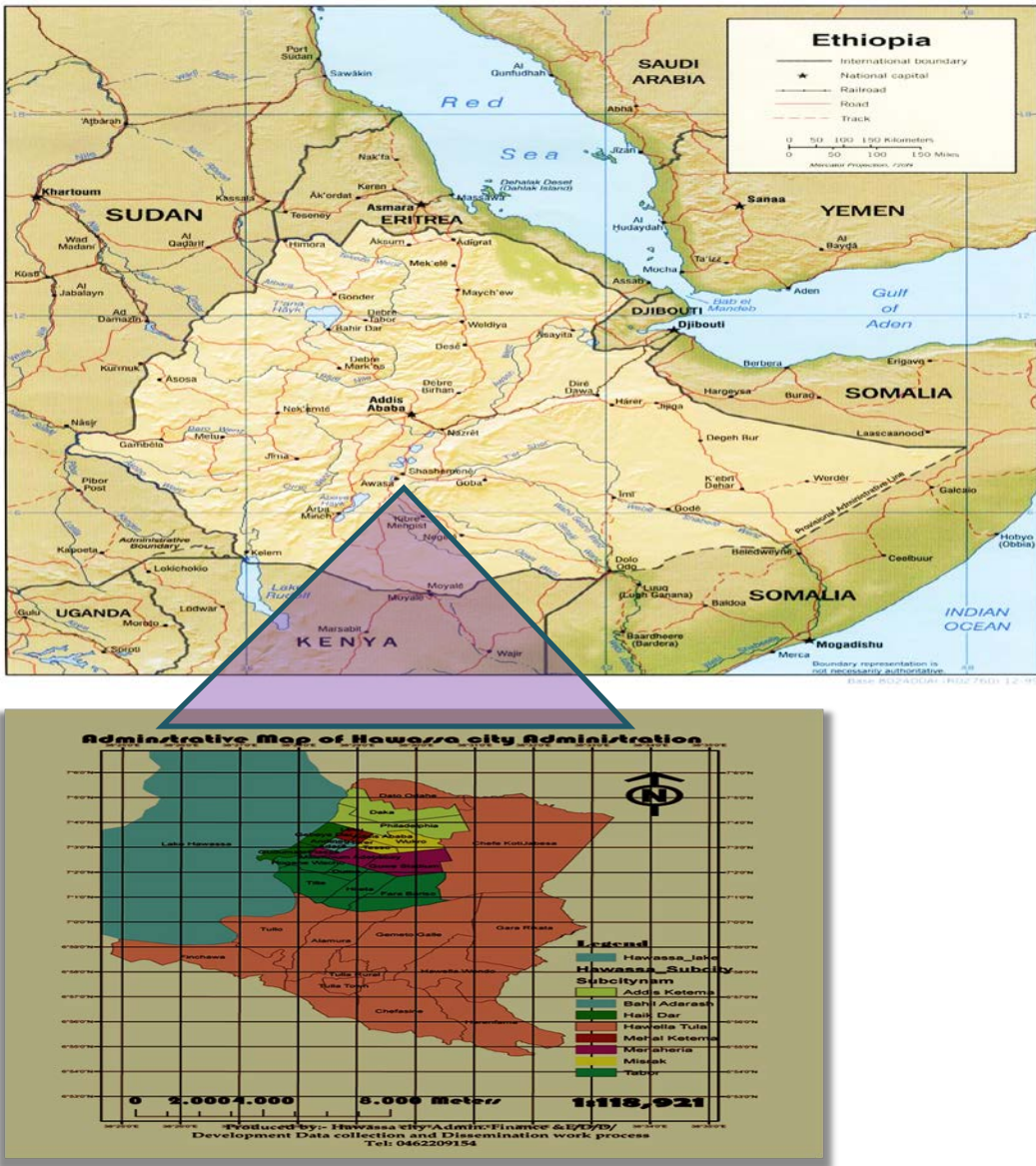
Hawassa is the capital of the Southern Nations, Nationalities, and Peoples Region (SNNPR)). As seen in figure 3.1 the city is located 275 kilo-meters south of Addis Ababa, the capital city of Ethiopia. Hawassa is also found on the international road extending from Cairo (Egypt) to Pretoria (South Africa). It is bounded by Lake Hawassa , one of the rift-valley lakes in Africa (Hawassa City Administration 2013:1).

Based on Hawassa city administration socio-economic profile (2013:2), the five largest ethnic groups residing in the city are the Sidama (48.67%), the Amahara (15.43%), the Wolayita

(13.9%), the Oromo (5.21%), and the Gurage (4.33%). All other ethnic groups made up 12.46% of the population. Sidamo is spoken as a first language by 47.97% of the inhabitants followed by Amharic (31.0%), Wolayita (9.58%) and Oromiffa (2.07%). It was also indicated on the AWASSA city administration that (2013:4), about 60%, 27%, 8%, and 4% of the population practice Protestant, Orthodox, Muslim and Catholicism respectively.

The health coverage of the city is 70% in 2013. There is one referral hospital, one district hospital, three private hospitals, seven health centres, 15 health posts, and 47 private clinics. There are three facilities rendering a comprehensive HIV service. These are HAWASSA referral hospital, Adare district hospital and Bushulo higher health centre. These facilities provide services such as paediatrics and adult ART, TB/HIV, the syndrome management of Sexually Transmission Infection (STI), HIV counselling and Testing (HCT), PMTCT, HIV palliative care and nutrition. Both urban and rural people are served at these health facilities. There is a well established referral linkage and communication (Hawassa City Administration 2013:6).

Thus the study setting was with 2 hospitals and 1 higher health centre having chronic HIV/ART care. In these health facilities the data collection was undertaken from 4th of June 2012 to 8th of August, 2013.



Source: Hawassa City Administration (2013)

Figure 3.1: Map of Hawassa city where the three study health facilities are sited.

TABLE 3.1: GENERAL CHARACTERISTICS OF THE STUDY SETTING, HAWASSA CITY 2012

No.	Facility Name	Type of facility	Responsible for	Ever enrolled to ART by end of June 2012	Number of participants recruited for this study
1	Hawassa Hospital	Regional referral and teaching	Ministry of Education and Health	2911	290
2	Adare Hospital	Regional	Regional Health Bureau of Southern Region	617	110
3	Bushulo higher Health centre	Higher Health centre	Hawassa city administration	478	60

3.3.1.2 Research Population

Castillo (2009) defined research population as a large collection of individuals or objects that are the focus of scientific inquiry known to have similar characteristic. A population also refers to the entire individuals in the certain group that has common binding characteristics or traits, to be studied (Babbie E. 2008:211). It is from this large population that a sample is drawn to make an inference about the population. In this study they are PLHIV who are on chronic HIV care in Ethiopia. Polit and Beck (2008:337) described a population as an entire aggregate of care in which a research is interested. This study is interested in PLHIV in Ethiopia.

Target Population

These are parts of cases about which an investigator wants to generalize (Polit and Beck. 2008:338). Target population is also known as theoretical population. According to Castrillo (2009), it's an entire group of individuals or objects to which researchers are interested in generalizing the conclusion. In this study theoretical population are PLHIV on chronic HIV care in public health facilities of Hawassa city.

Accessible Population

They are also called study or source population and are the subset of target population to which the researchers can apply their conclusion. It is from here that one draws sample

(Beck & Polit 2008:338; Castrillo 2009). In this study, the accessible population were PLHIV who visited chronic HIV clinic in the three health facilities during the period of data collection.

Sampling frame

According to Dr Hani (2009), members of study population are identified and a list will be constructed from where a sample is taken. This is called sampling frame. Polit and Beck (2008: 344) defined sampling frame as “a list of all the elements in the population from which the sample is drawn”. In this study the frame work is all lists of men and women living with HIV on chronic HIV care who fulfil the eligibility criteria in the three health facilities.

Sampling Technique

According to Castrillo (2009), it's too expensive and time consuming to contact every individual in the population. So, it's better to use sampling technique to recruit representative sample of the population.

Sample. A sample is a subset of a population selected to participate in a study (Polit and Beck. 2008:765)

Random sample and random error

Random sample is related to randomly selected sample from a population .It is assumed to be a representative of this large population. Therefore, every member of the population is independently chosen and has equal non-zero chance of being selected into the sample (Babbie 2008:212).

Bonita (2006: 51) states: “Random error is when a value of the sample measurement diverges – due to chance alone. Random error can never be completely eliminated since we can study only a sample of the population.... Sampling error is usually caused by the fact that a small sample is not representative of all the population's variables”. Thus, the sample mean of a random sample drawn from the population can be different from the population mean. This is especially true when the sample size is smaller (Bonita 2006: 51).

3.3.2 Sampling

Polit and Beck (2008:339) define sampling as a process of selecting a portion of the population to represent the entire population to make the inference about the population. In the fertility desire study, a probability sampling; specifically, stratified sampling followed by random sampling, was applied. Using the stratified sampling is helpful over the random sampling alone. This is because; dividing the population into distinct, independent strata enables to draw inferences about specific sub-group (Babbie 2008:224-27). During the current research,

the stratification was based on gender. Equal number of males and females was randomly selected from the three health facilities. The gender based stratified sampling would better lead to more efficient statistical estimate than only using random sampling. It also permits greater balancing of statistical process of test. However, it can be expensive to implement and isn't useful when there are no homogeneous subgroups (Polit & Beck 2008:246; Wikipedia [S.a]; William and Trochim 2008).

Subsequently, a sampling frame was prepared from patients list that were appointment on the dates of data collection. The date of appointment for each patient is electronically registered in the computer. It is from patients appointment list that random table was produced. Participants were selected randomly from the table using the lottery methods by computer. Therefore, a probability sampling was used. This forms a basis of random sampling (Babbie 2008:224). In this case, individuals in sampling frame would have equal chance of being chosen (Bonita 2006: 51). In the study, greater reliability is placed on the representativeness of probability sampling (Babbie 2008:210).

Inclusion Criteria

People living with HIV/AIDS in reproductive age group (18-49 years for women and 18-54 years for men) who had at least one visit to the selected three hospitals chronic HIV care units were the candidates. In addition, those who showed willingness to consent for participation in the study and those who could hear and speak Amharic were included. Eligibility criteria or inclusion criteria specify population characteristics which classify an individual as a member of the sample (Polit and Beck 2008:338).

Exclusion Criteria

A criterion can also be defined to exclude people as an exclusion criterion (Polit and Beck 2008:338). All PLHIV: who were unable to hear, mentally disabled, seriously ill and those younger or older than the age specified in the inclusion criteria were excluded from the study.

Sample Size

The sample size determination is based on the assumption that 50% of HIV positive individuals may desire and intend to have children with 5% margin of error and 95% confidence interval ($\alpha=0.05$). A non-response rate is assumed to be 20%. Thus, according to Daniel, WW (2009:192), the actual sample size for the study was determined using a formula for single population proportion.

$$n = \frac{(Z_{\alpha/2})^2 p(1-p)}{d^2} \qquad n = \frac{(1.96)^2 \times 0.5(1-0.05)}{(0.05)^2}$$

Where:

n=the required sample size

z= standard score corresponding to 95% CI

p= Assumed proportion of fertility needs

d= the margin of error 5%

None response rate = 20%

n= 384 + 20%

None respondent rate 20%= 77. Required sample size was 384 +77=461.

Based on the patient load, sample size of 290, 110, and 60 was obtained from Hawassa hospital, Adare hospital and Bushulo health centre respectively. Of course, the quotas for these health facilities were also in terms of equal number of males and females.

3.3.2.1 Procedure of enrolment and sampling

In each health facility the flow chart shown in figure 3.2 was used by data collectors. The sampling frame was prepared from the appointed and would be coming clients on the specified date of data collection. Stratification was done based on the sex from the sampling frame. From each male and female sampling frame lottery method was applied using computer.

In all the three health facilities there is a register data base installed on the compute. All the patients' information is available from this register data base including the appointment date of patients. Thus, those clients who would be coming on a certain date can easily be listed early in the morning of the date of appointment. This is a routine activity of every ART clinic. The list was made based on their pre-ART number and sex, not by their name. And it is from sex-based stratified frame that the participants were randomly selected using the computer.

The randomly selected PLHIV were approached till the intended numbers of males and females were selected. In all health facilities the assigned numbers of females were obtained earlier than the males. That is why the survey took more than two months though the data collection is divided into the three health facilities. Eligibility for the study participant was checked. Those who were found to be eligible were asked for both verbal and written consent

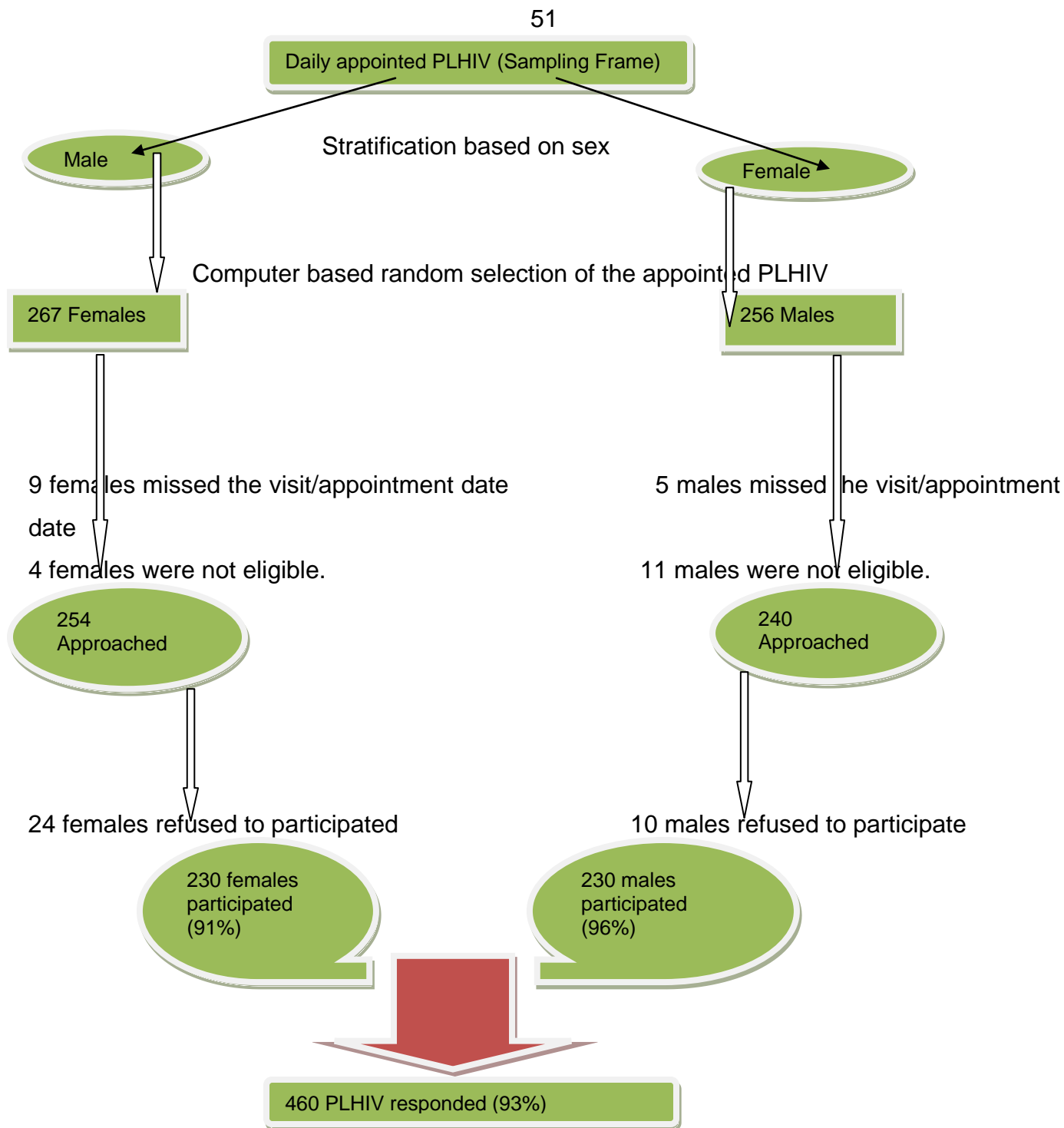


Figure 3.2: A flow chart and procedure of participant enrolment and sampling for the study.

As seen in the figure 3.2, 523 (267 female and 256 males) were randomly selected within the two months time. Fifteen were not eligible (4 females and 11 males), 14 did not show up though randomly selected. At end, 494 (254 females and 240 males) PLHIV were approached for interview where 34 (24 females and 10 males) of them refused to be part of the interview.

This makes the total response rate of around 93 percent, 91 percent in females and 96 percent in males.

Outcome Measures

The primary outcome measures for this study are fertility desire and fertility intention.

3.3.2.2. Ethical issues related to sampling

This study involves samples. The way one chose a sample can raise a number of ethical issues. The following key three items have to be considered whenever one thinks about the impact of sampling strategy on research ethics.

1. Sampling techniques

To get a sample it matters which unit to include or exclude. There is a need to be reasonable for the criteria. When probability sampling technique are used one need to obtain the right to access to study participants from IRB (Babbie 2008: 240).

In case non-probability sampling is used; example, convenient sampling, there is a threat that one unit is excluded unnecessarily. This might raise the ethical issue. To avoid such danger, using theory rather than practical reasons is preferred to determine the creation of a sample (Laerd Dissertation 2012). That is why all efforts were made by the researchers to perform probability sampling rather than a convenient sampling method in this facility based study.

2. Sample size

Both unnecessarily over-sized and under-sized samples put sample size in ethical issue. Over-sized sample can potentially expose an excessive number of people to a study.

Under-sized sample fails to answer research questions, not because the potential answer didn't exist but the sample size is too small. Therefore, a study should not expose excessive number of participants to unnecessarily distress. Computing sample size to estimate the sample size to achieve a goal is one way of minimizing an ethical issue concerning over-sized and under-sized samples (Laerd Dissertation 2012).

3. Gatekeepers

According to Burns and Grove (2005:189-190), there are cases when subject selection is base on beneficial treatment. They can also be selected for a reason related to their availability. Their compromised positions and easy manipulability might make them a 'victim' of easy selection. This is problem of gatekeepers where mangers have control over access to employees in an organization (Laerd Dissertation 2012). This can affect the representativeness of the sample, the reliability. Just as happened in this study, it is preferable

to perform random sampling of subjects after permission of IRB to avoid bias that might influence subject selection (Burns & Grove 2005:189-190).

Access to the participants was through three steps. Initially, ethical clearance was obtained from IRBs (UNISA of South Africa and SNNPR of Ethiopia). Then permission letter was written to health facilities from Health Bureau of Southern region. Eventually, both verbal and informed written consent was obtained from interviewees prior to every interview. Sample size calculation was also based on an evidenced formula of single population proportion. The inclusion and exclusion criteria were justified as well (See pages 9 & 10).

3.3.3. Data Collection

Structured data collection approach was used in the study. Cited in Polit & Beck (2008:433), and Babbie (2008:278) structured data collection is obtaining data by formal instruments and protocols that dictate what to collect and how to collect and record the needed information.

It also includes formulating a set of questions to be answered in specified sequence with predetermined response options. This helps to have an accurate, valid and interpretable data responding for research question (Polit & Beck 2008:414). Structured data collection is applied to collect very precise information to work with a large sample size. It is also used when one needs to be sure of what s/he wants to measure (Burns & Grove 2005:396; Polit & Beck 2008:414). In this study, numerical data was collected with same structured plan implemented in all the three health facilities. By doing so, all data were collected in exactly the similar way. It is the 'count' not the experience of fertility desire and intention that the study wants to obtain which makes structured data collection approach very appropriate for the study. Though quantitative data collection can take time and need effort, it yields data that are relatively easy to analyze (Polit & Beck 2008:371).

3.3.3.1 Development of Data collection Instruments

Babbie (2008:272) described questionnaire as document containing questions and other types of items designed to solicit information appropriate for analysis. Though producing a high quality structured data collection instrument is challenging and time taking, research requirements must be analysed, related construct need to be clustered into separate area of questions and the instruments must be made to reduce bias as well (Polit Beck 2008: 425). Questionnaire was developed after reviewing relevant literature on the phenomenon under

study with due consideration of the research problem and the research question. To ensure the reliability and full capture of information by the questionnaires, thorough conceptualization and operationalization of the construct was carried out. The conceptualization was mainly come from the exhaustive literature review, specifically the TDIB theory by Miller (1994). The logical flow of the questionnaire therefore is based on the TDIB theory. The questionnaire was originally prepared in English and then translated to the Amharic. Prior to data collection, the questionnaire was reviewed by experts. It was also piloted beforehand. In short the questionnaire used in this study was developed from literatures with similar studies which has used the TDIB theoretical frame work by Muller (2010) specifically from the Nigerian (Cooper 2009; Olufemi 2005) and Canadian study (Loutfy 2009), and EDHD(Central Statistical Agency [Ethiopia] and ICF International, 2012).

3.3.3.2 Characteristics of the Data Collection Instrument

All the questions are close-ended. This is because the close-ended questions provides a greater uniformity of responses and are more easily processed than open-ended ones (Babbie 2008:272). To ensure standardized recording, accuracy and usefulness of the data for data analysis (Polit & Beck 2008: 414), each category on the instrument were assigned a numeric value and responses were coded. All the variables on the questionnaires were also measured at the highest possible rating scale. See table below

3.3.3.3 Structure of the Questionnaires

The questionnaire used in this study is segmented into six sections.

Part I: Socio-demographic characteristics involving age, gender, ethnic group, religion, marital relationship, highest educational level, occupation, resident, average monthly income and family size in the household.

Part II: HIV and ART History section includes duration since HIV diagnosis and ART initiation, status of ART initiation, and health status after ART initiation

Part III: Fertility History section with total birth experienced thus far, number of births before and after HIV diagnosis, number of births before and after ART initiation.

Part IV: Characteristic of partners of study subjects. This part have duration in relationship, disclosure of HIV status to partner, whether partner was tested for HIV, partner HIV status and partner fertility desire.

TABLE 3.2: CATEGORY AND LEVEL OF MEASUREMENT OF STUDY VARIABLES

Variables	Category	Level of Measurement
<i>Independent</i>		
Age	Continuous numeric	Ratio
Gender,	Binomial	Nominal
Ethnic group, religion, marital status, resident	Categorical	Nominal
Average monthly income	Continuous numeric	Ratio
Family size, number of births	Discrete	Ordinal
Duration since HIV diagnosis, on ART and in relationship	Continuous numeric	Ratio
Use of family planning, status of disclosure and Start of ART status	Categorical	Nominal
<i>Dependent</i>		
Fertility desire, Fertility intention	Binomial	Nominal

Part V: History of Family planning: This part contains use of family planning by the respondents and by the partner, and type of contraceptive used by the study participants and their partners.

Part VI: Fertility desire, fertility intention and action taken to get pregnant or not by PLHIV The last part have got fertility desire, number of intended children, the reasons for desiring and not desiring for future fertility, and actions taken to get pregnant and not to get pregnant.

3.3.3.4 Approaches to data collection

In the fertility desire and intention study, structured and face-to-face interview was conducted. Polit and Beck (2008:756) defined interview as “ the data collection method in which an interviewer asks a question(s), either face-to-face or by telephone”. In structured interview, respondents are asked same question with same wording, same sequence following same structured format (Burns & Grove 2005: 396; Joubert & Ehrlich 2007:107; Polit & Beck 2008:371). To increase the reliability of the information obtained, structured face-to-face interview using close-ended questions was carried out (Babbie 2008:272). Burns and Groove (2005:396) state the advantage of structured interview as a high respondent rate where more representative sample can be obtained.

Probing technique is not used in the structured interview. According to Joubert & Ehrlich (2007:108), this is to prevent interviewers from placing their own interpretation. Verbal and non-verbal comment can cause bias and have an influence upon respondents' answer. These were prevented in the study by training and orienting the interviewers beforehand. Only repetitions of the question are adequate for those who don't understand the question (Burns and Groove 2005:396). There are occasions where structured interview responses are lengthy or complex. In this case printed card called 'show card' will be given to subjects for selection of a response (Burns & Grove 2005:397; Polit & Beck. 2008:429).

Subject bias is still a threat in structured interview especially in a multi-site study. To avoid these problems, role play and pilot test at the study health facilities in 10-20 patients prior to the main interview was practiced. Unbiased verbal and non-verbal manner was maintained. The interviewers were trained and informed to be dressed nicely. The space for the interview was quite, private and pleasant environment (Burns & Grove 2005: 397; Polit & Beck 2008:429).

3.3.3.5 Problems during data Collection

Burns and Grove (2005:433-37) list people problems, challenges of selecting samples, private room selection, subject mortality, subject as an object, researcher role conflict etc as problems during data collection. During the current study there were occasions where other staff members were trying to interfere with data collection for the sake of benefits. Also the computer based random sampling was also challenged with missed visits and thus it took a lot

of time to reach at the required number of sample size in the three health facilities. Moreover, a private area away from distraction was difficult to select at Hawassa and Adare hospitals for high patient load. The problems were analysed before hand and dealt with accordingly. Example, other hospitals staff members were communicated and explained about the purpose of the data collection and the procedure so that conflict of interest with data collectors and shortage of private room were resolved.

3.4 VALIDITY AND RELIABILITY OF MEASUREMENT

What the test or measurement strategy measures and how well it does so, according to Marczyk et al (2005:106), describes validity. The same authors indicate that validity seeks to answer the question: “Does the instrument or measurement approach measure what it is supposed to measure?”. Validity and reliability are therefore two important technical considerations in most researches to evaluate a research instruments in terms of adequacy and quality (Babbie 2008:157; Marczyk et al 2005: 103 & 104).

3.4.1 Reliability of a measurement

Reliability can be described as the consistency or dependability of a measurement (Marczyk et al 2005:103). As stated by Burns and Grove (2005:374) reliable instrument enhances the power of a study to detect significant difference or relationship occurring in the study population. Thus, responses to a question would give same data in repeated observations (Babbie 2008:157). Nevertheless, problems of reliability can crop up when different research workers or interviewers get different answers from due to their own attitudes and demeanours (Babbie 2008:158).

3.4.1.1 Strategies of improving the reliability of instruments

Marczyk et al (2005:104-105) mentioned the following techniques of increasing the reliabilities of a measurement and reducing the likelihood of measurement error or bias due to random factors.

1. Administration of standardized instruments: this allows the occurrence of measurements consistently across all participants.
2. Making sure that the instructions and the content of the instrument are well understood. This would easily avoid bias.

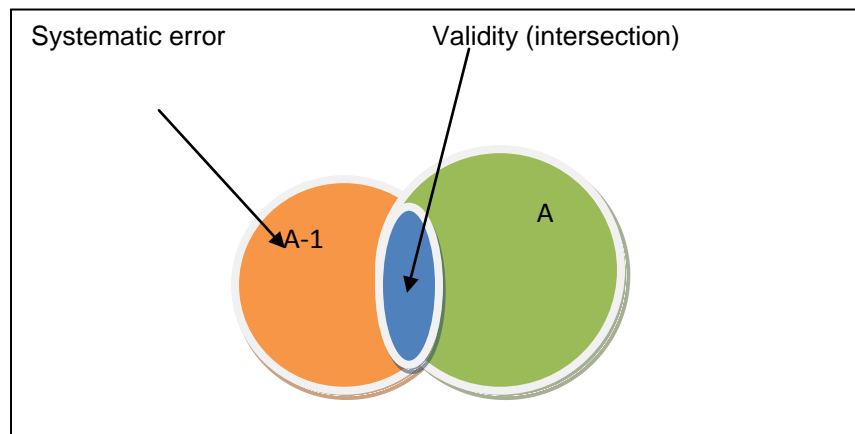
3. Training of researchers or data collectors in the use of the instruments. Ample practice and repeated training over the course of the study to maintain consistency is critical.
4. Ensuring that data are recoded, compiled and analysed accurately. Data entry should be closely monitored and audits should be conducted regularly yet total reliability does not ensure that one measures what one thinks they measure (Babbie E. 2008:159).

In this fertility desire and intention study repeated supervision by two supervisors were carried out daily in the three health facilities. Clarity on the questions in the questionnaire was dealt with during the training and orientation on the research, piloting and during data collection process. Specificity was given an emphasis to each question. The data collectors were made to practice data collection process before the real data collection on other PLHIV not involved in the study as well as among themselves. Uniform interview was conducted all over sticking to the protocol after the interviewers were prepared and trained on how to conduct the interview beforehand. The study was also piloted.

3.4.2 Validity of a measurement

Validity reflects the concepts it is intended to measure (Babbie 2998:160-161). Burns and Grove (2005:376) described validity as determination of the extent to which the instrument actually reflects the abstract construct being measured. The concept addresses the appropriateness, meaningfulness and usefulness of the specific inference made from instrument scores. Validity of the instrument is equated with the rigorousness of a study (Burns & Grove 2005:377).

Cited by Marczyk and his colloquies (2005:106), validity has to do with truth, strength and value. It can be inferred that if measurement of the concepts improves then validity also improves by reducing systematic error. Systemic error, as seen in the figure 3.3, is the extent to which the measurement instrument measures items other than the concept (Burns & Grove 2005:377).



Source: Burns & Grove (2005:377)

Figure 3.3: Representation of instrument validity

3.4.2.1 Content validity

According to Marczyk et al (2005:107) content validity is one of the commonly used strategy to ensure validity in cross-sectional studies. It is also applied in this study. Content validity starts with the development of questionnaires where experts have to review for appropriateness, accuracy and representativeness. Based on the 4 scale rating of the experts, the instrument could be 1 not relevant, 2 need modification, 3 relevant but need minor modification, or 4 very relevant and succinct (Marczyk et al 2005:107)

As determination of content validity starts with operationalization of the construct of instrument (Marczyk et al 2005:107), the fertility desire and fertility intention study has both conceptual and operational definitions based on the literature review and TDIB theory. Thus, it accurately captured the content of the construct. In this study the development of the questionnaire was not only preceded by extensive literature review but revised by three experts who did give their comment as scale rating of 3 where some modification per their comment was made. The questionnaires was also translated to Amharic and back translated to English.

3.5 PILOT STUDY: TESTING OF RELIABILITY AND VALIDITY OF DATA COLLECTION INSTRUMENTS

Cited by Burns and Grove (2005:42) pilot study is smaller version of a proposed study conducted to develop and refine a research treatment, a data collection tool, or the data collection process. Pilot study for 23 PLHIV at HAWASSA (11) and Adare (7) hospitals as well as at Bushulo (5) health centre was performed.

It was with a purpose of evaluating the appropriateness and quality of the instrument. Though findings from the study were not included in the final data analysis, the sequence of questions in the fertility desire and intention part of the instrument, the sequence of options/choices in the actions taken to get pregnant and not to get pregnant were also corrected. Moreover, the option of "others" were added for the other possible answers in the options.

In summary validity is an interconnected concept with reliability; measurement can't be valid unless it is reliable (Marczyk et al 2005:106). Therefore, reliability is a hallmark of validity. Yet a measurement can be reliable without being valid.

3.6 ETHICAL CONSIDERATION RELATED TO DATA COLLECTION

Research ethic is associated with morality governing research from inception to completion and publication of results (Babbie 2008:66-67). Rivera & Borasky (2009: 5-6) mentioned that the trust in research results on the trust in the integrity of researchers and the reliability of the result of their scientific works. Thus, if science is to remain trustworthy, researchers must observe basic moral principles in their work.

3.6.1 Fundamental Principles of Human Research Ethics

The three basic ethical principles guide all researches involving human subject. They are respect for person, beneficence and Justice (CIOMS/WHO 2002; Rivera & Borasky 2009: 5-9).

3.6.1.1 Respect for person

Respect for person involves autonomy, self-determination, capacity to decide, make choice, the dignity of people and the individuals (Rivera & Borasky 2009: 5). Sigh (2007:32) described the two moral requirements of respect for person; the need to acknowledge autonomy and the requirement to protect those with diminished autonomy. Autonomy person, cited by Sigh (2007:32), is an individual capable of deliberating about personal goals and acting under the direction of such deliberation. To show respect is to give weight to autonomous persons' opinions and choices. To deny individual respect is to show lack of the freedom to act on considered judgments and withhold information necessary to make judgments when there is no reason to do so, according to Sigh (2007:32).

During the data collection of this study participants were made clear as it was their full choice to participate in or refuse to take part in the study. It was with respect that they were

approached. It was also read for them that their opinion is autonomous. It was with their self – decision that they were part of the study.

3.6.1.2 Beneficence

Rivera & Borasky (2009:7) indicate that beneficence is risks reduced (non-mal-efficiency) to ensure physical, mental and social well-being. As complementary expressions of beneficence, Sigh (2007:32) formulates two general rules of beneficence; maximizing possible benefits and minimizing possible harms.

As this study was an observational study there was no risk full intervention made to the study participants. The way the outcome of the study could be beneficial for PLHIV was also explained to them before the interview.

3.6.1.3 Justice

According to this principle, all research participants should be treated equitably (Sigh 2007:33). It is also a fair recruitment of research participants and distribution of risks and benefits (Rivera & Borasky 2009: 9). This offers special protection for vulnerable groups.

Non-purposive sampling approach was applied which can ensure fair selection of the study participants. As the study is not an experimental type it was not worrisome concerning uniform distribution of the risks and benefits.

3.6.2 Informed Consent

3.6.2.1 Obtaining Informed Consent

One of the foundations of research ethics is the idea of informed consent. CIOMS/WHO Guideline 4 stated the informed consent as: "... for all biomedical research involving humans the investigator must obtain the voluntary informed consent of the prospective subject or, in the case of an individual who is not capable of giving informed consent, the permission of a legally authorized representative in accordance with applicable law. Waiver of informed consent is to be regarded as uncommon and exceptional, and must in all cases be approved by an ethical review committee."

Individual has to receive the necessary information should understand the information adequately and ought to arrive at a decision. This is usually regarded as an informed consent.

S/he ought not to be subjected to coercion, undue influence or inducement or intimidation (Rivera & Borasky 2009:26; Sigh 2007:35). Simply put, consent is a communication process between the researcher and the participants, usually starts before the research is initiated and continuing through the duration of the study (Laerd Dissertation 2012).

Essential information need to be addressed during the process of informed consent. These include the purpose of the research, the methods being used, the possible outcomes of the research, confidentiality, voluntary participation, associated demands, discomforts, inconveniences as well as risks that the participants may face (Laerd Dissertation 2012; Nuffield Council on Bioethics 2005:11-15; Sigh 2007:35). Whilst it is not possible to know exactly what information a potential participant would (or would not) want to know, one should aim not to leave out any material information. This is, the information that one feel would influence whether consent would (or would not) be granted (Laerd Dissertation 2012).

Another component of informed consent is the principle that participants should be volunteers, taking part without having been coerced and deceived. Where informed consent cannot be obtained from participants, you must explain why this is the case (Nuffield Council on Bioethics 2005 11-15; Laerd Dissertation 2012). Without exaggeration, reasonable benefits available needs to be described. One has to explicitly indicate person who may access to the information- degree of confidentiality. Study participants need to be told that there is no penalty for refusal to participate. Rather, there is absolute voluntary, the right to discontinue at any time (Nuffield Council on Bioethics 2005 11-15; Rivera & Borasky 2009:37).

In this study the development of the informed consent form is from previously carried out researches. It was translated to local language, Amharic. It was also pilot-tested. Subjects were made to participate in the study only after they have had read the statement for them and signed on it (Babbie 2008:47).

In addition, study participants were briefed on the aim and significance of the research. They signed informed written document prior to the interview. Verbal consent was obtained from those who cannot read and write. The participants were informed that the participation was absolutely voluntary and refusal was possible. They were also told that there would be no penalty for not participating. The information regarding the possibility and the right of refusal in the middle of the interview was issued.

3.6.3 Protecting Anonymity and Confidentiality

Protecting the anonymity and confidentiality of research participants is another practical component of research ethics. Study respondents shall be willing to volunteer information if the researcher keeps such information in confidence (Laerd Dissertation 2012). It is possible that research participants may be hurt in some way if the data collection methods used is insensitive (Babbie 2008:470-72). This occurs when data is not treated confidentially, whether in terms of the storage of data, its analysis, or during the publication process. It may be possible to disclose the identity and views of individuals at various stages of the research process (Laerd Dissertation 2012). Yet, permissions should be sought before such confidential information is disclosed (Sigh 2007:35-36).

In this study research participants were also told their name was anonymous. They were also informed that confidentiality of their information would be kept. So, unauthorized individuals won't access to the data. The data will be recorded electronically and back-up of multiple copies was kept in secured multiple locations for confidentiality (Sigh 2007:35-36).

To further ensure the confidentiality, individual identifiers (e.g., vernacular terms, names) were not taken during data collection (Laerd Dissertation 2012). Eventually, their willingness to participate in the study was asked. If they were willing to participate, they would be thanked. It was after they put their signature on the informed consent form that the interview was conducted. Otherwise, the patient is not forced to participate

3.6.4 The Institution/Site

Guideline 2 of CIOMS/WHO (2002) states: " All proposals to conduct research involving human subjects must be submitted for review of their scientific merit and ethical acceptability to one or more scientific review and ethical review committees. The review committees must be independent of the research team, and any direct financial or other material benefit they may derive from the research should not be contingent on the outcome of their review. The investigator must obtain their approval or clearance before undertaking the research. The ethical review committee should conduct further reviews as necessary in the course of the research, including monitoring of the progress of the study." Still, committees must be multidisciplinary and competent to review and approve scientific aspects of research

proposals. Scientific review must consider the study design, including the provisions for avoiding or minimizing risk and for monitoring safety (Rivera & Borasky 2009:52).

The ethical review committee is responsible for safeguarding the rights, safety, and wellbeing of the research subjects (CIOM/WHO 2002). Rivera and Borasky (2009:52-53) described that role of members of REC is not only limited to initial review and approval of a research but they are to conduct regular review of ongoing research, review all modification and amendments to approve research, monitor for active research studies for compliance and also investigate problem that could impact the safety of the participants.

The initial review of research protocol was conducted by Research Ethical Committee (REC) at UNISA. The REC approved the protocol after reviewing informed consent documentation and data collection instruments in addition to the research protocol. The committee also monitored and confirmed that the protocol was being followed as approved (Rivera & Borasky 2009:53). The approved protocol of this study was submitted to Institutes of Review Board (IRB) of SNNP research wing for a complementary local scientific review and permits to conduct the study. Then, letter from regional health bureau was obtained to communicate with the medical directors of Adare hospital, Bushulo health centre, and Hawassa hospital to collect data.

3.6.5 Scientific Integrity of the Research

Research results might be influenced by conflict of interests and the publication of fabricated data (Bonita & Beaglehole 2006:59). To maintain scientific integrity and eliminate the possibility of scientific misconduct and plagiarism, the researchers in this fertility desire and intention have taken the following steps:

- Observed principles of scientific work when obtaining, selecting and assessing scientific data, and at the same time take into account the specificity of the study.
- Accounted for the precision and objectivity of this research and recognized the limits of research methods used.
- Are responsible for the completeness and verifiability of the results in the dissertation for their undistorted interpretation.
- Refrained from falsifying or fabricating primary and secondary data sources which the researcher abstracted data from during the conduct of the research.

- Preserved primary data and documentation used during the study.
- Acknowledged the scientific contributions of predecessors and colleagues to the question studied to which the dissertation is linked directly.
- When citing ideas, words, processes, findings and results obtained by other authors, a clear reference was made to the respective source.
- Cite important results which are contrary to the researchers' results and conclusions.

(Bonita 2006; Burns and Grove: 2005:204-205; CIOMS/WHO.2002; Rivera & Borasky 2009: 61).

3.6.6 Scientific Integrity on the Part of the Researchers

Rivera and Borasky (2009:61) indicates that researchers are responsible for ensuring that no participant will be involved in the research before getting informed consent. The CIOMS guideline also states that the researcher has the duty to communicate to the prospective subject all the information necessary for adequately informed consent. Above all, the researcher has an obligation to protect the confidentiality of the study participants (Rivera & Borasky 2009:61).

By providing adequate training, orientation and on-job mentoring, the researcher can maintain the integrity of the study. S/he must abide by rules and regulations stipulated by RECs (CIOMS/WHO 2002; Bonita & Beaglehole 2006:60).

As a researcher, honesty was kept because collecting objective data in a socially responsible way is basic to scientific research. The integrity of the study was tried to be accomplished by training the staff in research ethics, by strict adherence to study procedures, and by being transparent in identification and management of conflict of interest (Rivera & Borasky 2009:60).

3.7 DATA ANALYSIS

Babbie (2008:443) defined a quantitative analysis as "the numeric representation and manipulation of observation for the purpose of describing and exploring the phenomena that those observations reflect". According to Marczyk et al (2005:198) the process of data analysis involves.

1. Data preparation and management
2. Analysis of the data and
3. Interpreting the data; testing the research hypothesis and drawing valid inference.

3.7.1 Data Preparation and Management

In addition to ensuring the confidentiality and security of personal data, Jobert (2007:128) suggested that the researcher should be able to track and enter the data, and organize the data into a data base. Setting up a data recruitment and tracking system on a computer data base, like in this study, provides with up to date information throughout the study, saves time and easily be ready for analysis (Jobert 2007:128-129)

3.7.1.1 Data Screening

Data checking or screening can be done manually or electronically (Marczyk et al 2005: 200) to ensure data accuracy and completeness (Joubert G.2007:128). In this study manual data checking was done soon after the data was collected to screen for plausible ranges; for instance of age, implausible codes for gender or area of residents. In case of inaccuracy, participants were contacted promptly. Per the recommendation by Marczyk et al (2005:2001), further data screening was done in the fertility desire study to ensure that responses were legible and understandable; the responses were within acceptable ranges, responses were complete and accurate.

3.7.1.2 Constructing a Data Base

Once corrections are made through data screening, data should be entered to a well structured data base (Marczyk 2005: 204). In this study data entry questionnaire format in the Epi-info version 3.5.3 of 2011 was prepared from pilot tested questionnaires.

3.7.1.3 The Bata Code

“ Data code is a written or computerized list that provides a clear and comprehensive description of the variable that will be included in the data base.” (Marczyk 2005: 204). In this study, with the inclusion of names descriptions and abbreviations of the variables codebook was developed before initiation of data collection based on researches performed before. See Chapter 4 page 92 for the details of coding.

3.7.1.4 Data Entry and Cleaning

Marczyk et al (2005:203) explained that one way of ensuring the accuracy of data entry is through double entry. In double data entry, data are entered into the data base twice and then compared to determine whether there are any discrepancies (International Household Survey Network (IHSN): [S.a.]).

Though time or cost ineffective, the identified discrepancies were resolved, corrected or simply treated as a missing data, per the recommendation of Marczyk et al 2005:204).

In this study two data entry clerks were recruited and involved in the data entry. One did the primary data entry and the second person did the second data entry. Double checking in same Epi-info data entry but after 20 questionnaires were entered had been performed.

After this double data entry, each questionnaire was stored in three folders per the name of the three health facilities. The data had been stored in PC. Second copy of data was filed as a backup data in CD-ROM. At end of the data entry the original data was coded for safeguard, as recommended by Burns and Grove (2005:452).

Epi –info statistical package of 2011 was used which assisted ignoring case in which variables are missed. Before analysis, variables were checked for normal distribution in order to avoid overestimation (Type I error) by examining skewness (Marczyk et al 2005:205). See figure 4.2 in Chapter 4.

3.7.2 Data Analysis

Once the data is screened, entered, cleaned and coded it is easy for analysis. According to Babbie (2008:448) data can be analyzed for a single variable (Univariate analysis), for two variables (Bivariate analysis) or for more than two variables (multivariate analysis).

In case of univariate analysis, commonly described as descriptive statistic; frequency distribution, central tendency and measures of dispersion were computed (Babbie 2008:448; Joubert 2007:128-137; Rosner 2006:7-18). This is aimed to accurately describe distribution of certain variables within specific data set.

Frequency distribution is delivered in a frequency table where all possible scores for a particular variable, with number of times (frequency) that each value appears in the data set

(Marczyk et al.2005:209). Frequency table is one of the most widely used to describe variables in this study. Categorical variables were also summarized by numbers and percentage (Joubert 2007:136)

3.7.2.1 Central Tendency

Central tendency used to report the overall distribution of values that defines the centre or middle of the sample (Rosner 2006:10). This includes mean (arithmetic and geometric), median, and mode. In this study numerical variables were summarized using means, median and mode based on the symmetry of the data.

3.7.2.2 Measures of Dispersion/Spread

Refers to the way values are distributed around some central values such as mean (Babbie 2008: 453). These are ranges, quintiles, variance and standard deviations which are used in the fertility study as well. In addition, graphic displays of the variables were also applied for description.

3.7.2.3 Bivariate Analysis

According to Babbie (2008:459) bi-variate analysis is an analysis of two variables simultaneously. It focuses on the variables and their empirical relationship rather than only describing. Bi-variate analysis commonly used contingency tables where values of the dependent variables are contingent (depends on) value of the independent variables (Rosner 2006:360-62). In association with the bivariate analysis odds ratios, correlation coefficient, chi-square and p-values are used to describe the variables relationships. Regression and correlation analysis could be applied in bi-variate analysis (Rosner 2006:426).

3.7.2.4 Multi-variable Analysis

It is analysis of the simultaneous associations among several variables. Here regression and correlation analysis is also applied. In this specific analysis stratification and multiple logistic regression is carried out to adjust or control for possible confounders.

In the fertility desire and intention study the data were analyzed using the Epi-info version 3.5.3 of 2011. Odds ratios, confidence intervals and a Chi-square test are used to assess the associations between independent variables with the outcome variables. The choice of

explanatory variables was guided by review of the available literature. The variables are tested for statistical significance using chi-square tests and/or odds ratio. Those variables which are significant in the bi-variate setup ($P < 0.25$) are included in the multivariate logistic regression.

In summary, the variables associated with fertility desire and intention at p -value < 0.25 during bi-variate analysis are involved in the multivariate logistic analysis. For variables associated with fertility desire and fertility intention, possible confounders, effect modifiers and mediator variables are identified. See chapter 4 for the detail of analysis and the procedure of the multivariable analysis.

3.7.3 Interpreting the Data; Testing the Research Hypothesis and Drawing Valid Inference.

See chapter 4.

3.8 STUDY VALIDITY

Validity is a key concept of a research. It refers to how close a study finding comes to the truth (Myer and Karim 2007:156). The essence of validity is because one needs to increase the accuracy and usefulness of findings by eliminating or controlling as many confounding variables as possible.

It deals with problems with systematic errors (Carlson and Morrison 2009:157). Epidemiologists used the term bias to refer to problems in the design or conduct of epidemiological studies that lead the study results to be invalid. Thus, a biased study finding does not represent the truth (Myer and Karim 2007: 160).

3.8.1 Factors that Influence Validity of Study Results: Bias

According to Babbie (2008:277) and Myer & Karim (2007:160) bias is any trend in the collection, analysis, interpretation, publication or review of data that can lead to conclusions that are systematically different from the truth. Myer and Karim (2007:160) have mentioned that a biased study finding is attributed to selection bias, information bias or confounding.

3.8.1.1 Selection Bias

Selection bias is where systematic error in selection of participants leads to unrepresentative nature of sample (Bonita & Beaglehole 2006:53). This can influence the true prevalence,

incidence, risk ratios, rate ratios or odds ratios (Myer and Karim 2007:160). Cross-sectional studies are a victim of sampling bias when participants with similar characteristics are selected; volunteer bias when only the volunteers are considered; non-response bias in which case a response rate should not be less than 80%.

The fact that random sampling was applied in this study could reduce the selection bias. In addition, the response rate was about 93% which is above the acceptable range making this study somehow safe of selection bias.

3.8.1.2 Information Bias

This is a bias where systematic error of data collection leads to errors in measurement of exposure of disease (Myer S, Karim SA. 2007:163).

Interviewers/observer bias is when the knowledge of the data collector about the exposure and outcome may influence the manner of interview proceeds including the response. Recall bias is when those with a particular outcome or exposure may remember events more clearly or amplify their memories (Bonita & Beaglehole, 2006:54). Reporting bias is also when for a variety of reasons, including issues of social desirability or sensitivity, study subjects may not be willing to report accurately (Myer Karim 2007:163).

Even though social desirability was inevitable as fertility desire among PLHIV can be a sensitive issue, the data collectors were trained well before interview how to be neutral. That is, no probing questions were allowed. Durations after HIV diagnosis and ART initiation were some of the items in need to recall which might make the study participants susceptible to recall bias.

3.8.1.3 Confounding

Confounding is when false inter-correlation of risk factors is due to distortion of exposure - disease relation by some other factor (Bonita & Beaglehole 2006:54). As shown in the figure below, three criteria are necessary for a variable to act as a confounder: it should be an independent risk factor for the outcome, the confounder must be associated with exposure and the confounder must not be a consequence of the exposure (Myer & Karim 2007:165).

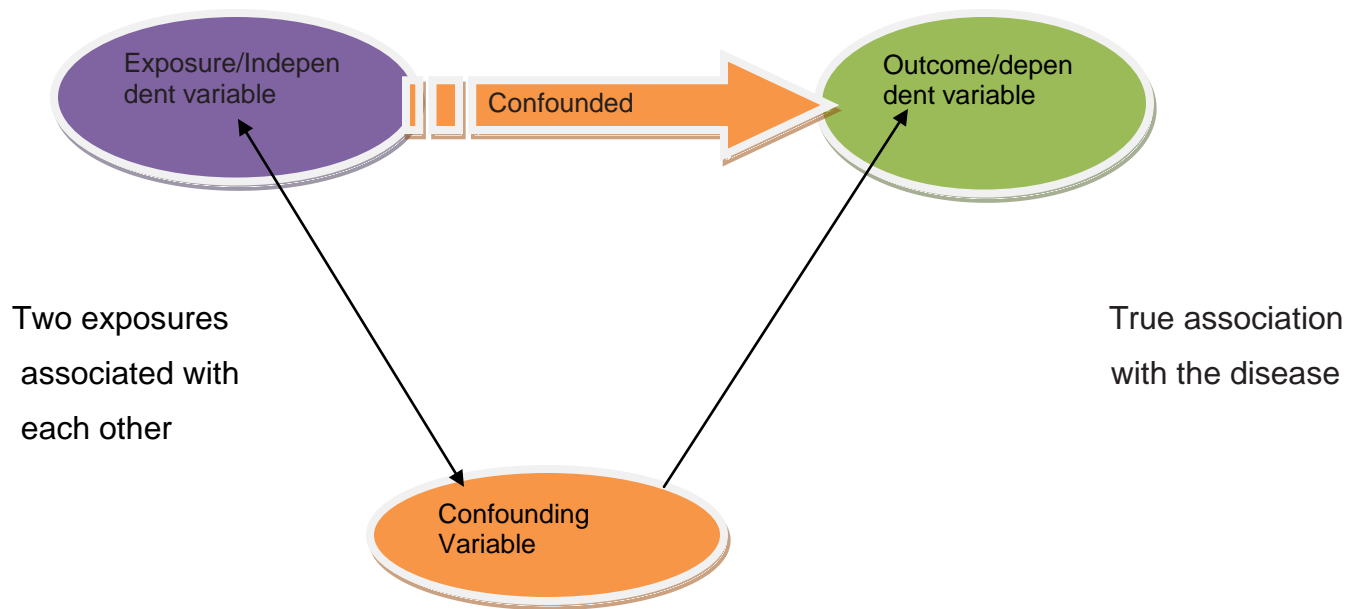


Figure 3.4: Graphic schema for confounding. (Source: Bonita R, & Beaglehole, R. 2006:55)

The control of confounding

Randomisation, matching and restriction can be tried at the time of designing a study to reduce the risk of confounding. At the time of analysis stratification and multivariable (adjusted) analysis can achieve the same. It is preferable to try something at the time of designing the study (Bonita & Beaglehole 2006:56). In this study, confounders were controlled using the stratification and multivariable analysis.

3.9 INTERNAL AND EXTERNAL VALIDITY OF THE STUDY

The quality of both observational and experimental studies can be evaluated in terms of internal and external validity (Carlson and Morrison 2009:81).

3.9.1 Internal validity

Internal validity is described by Bonita & Beaglehole (2006:58) as "... the degree to which the results of an observation are correct for the particular group of people being studied". Though it is a concern in all studies it has been addressed more commonly in experimental researches (Babbie 2008:254). Burns and Grove (2005:215) have also stated that the result findings are the true effect of the research rather than the possible explanation by extraneous variables, rival hypothesis. Thus, a researcher has to design the study in such a way to rule out

implausible alternative explanation of results demonstrating that the independent variable is solely responsible for the effect on the dependent variable (Marczyk et al 2005:159).

There are a lot of threats to internal validity as a possible other explanation for a cause which lead to internal invalidity. They are history, maturation, instrumentation, testing, statistical regression, attrition, diffusion of treatment (Marczyk et al 2005:159-169; Burns & Grove 2005:215-17; Babbie 2008: 254-57).

3.9.2 External validity

External validity or generalizability is the extent to which the results of a study apply to other conditions, participants, time and place (Bonita & Beaglehole 2006:58; Marczyk et al 2005:176). It also concerns inferences about the extent to which relationships observed in a study hold true over variations in people, conditions and settings as well as over variations in treatment and outcomes (Polit & Beck 2008: 301). Strong external validity is thus when one result of the study is generalized beyond the sample used in the study (Burn & Grove 2005:219; Marczyk et al 2005:174). On the other hand external invalidity, as described by Babbie (2008:257), is the possibility that conclusions drawn from experimental results may not be apply to the 'real' world.

There are a lot of factors stated as threats to external validity. Controlling the influences of these threats allows a researcher to be confident for generalization. These threats are over representation of a sample, multiple treatment interference, unique or novelty of the stimulus other than the intervention, awareness of being assessment, pre-test and post test sensitization, timing of measurement or assessment (Burn & Grove 2005:219; Marczyk et al 2005:180-187). Thus, the external validity of a study is supported if similar results are found in studies in other populations (Bonita & Beaglehole 2006:58).

3.9.3 Construct Validity

As described by Marczyk et al (2005:188) construct validity addresses whether the theory is supported by the explanation of study findings. It examines the fit between the conceptual definitions and operational definitions of variables (Burn N and Grove SK. 2005; 219:217). Thus improving the construct validity depends on the clarity with which the study is

operationalized and whether the underlying theory of the study should have a strong conceptual basis and well validated constructs (Marczyk et al 2005:190).

3.9.4 Statistical Conclusion Validity

Statistical validity address the question 'is the relationship or the difference, detected through the statistical analysis, accurate and real reflection of the real world?'(Burn N and Grove SK. 2005:214). It also concerns the validity of inferences that there truly is an empirical relationship or correlation between the presumed cause and effect (Polit & Beck 2008: 286).

Low statistical power, procedural and participants variability, unreliability of measures as well as the presence of multiple comparisons are the threats to statistical validity which need to be looked into before and during data analysis (Marczyk et al .2005:196). Otherwise a researcher will end up in false conclusions (Burn & Grove 2005:214).

In this study the purposive sampling methods used, stratified and random sampling, was one technique in support of ensuring external validity. In fact, interpretations and generalizations were made with care as there were limitations to the study. In addition to both conceptual and operational definitions, the explanation of the findings was also supported by the TDIB theoretical framework.

3.10 CONCLUSION

The fertility desire and fertility intention study is a quantitative cross-sectional study carried out in the Southern part of Ethiopia, Hawassa city, among 460 PLHIV with a respondent rate of 93 %. It was done among PLHIV who attended chronic HIV clinic in the three health facilities from June to August 2012. Goes with the quantitative paradigm, a probability sampling, random and stratified sampling methods is applied. TDIB based structured, close-ended pre-tested questionnaire is used for data collection. The study is performed sticking to the basis of ethical principles during sampling and data collection procedures. After IRB was obtained from UNISA and SNNPR research wing, letter of study permission was written to the facilities where written and signed informed consent was strictly used while cascading the structured interview procedure. Autonomy, confidentiality of the study participants were also taken cared. Data security and confidentiality were also dealt with using the back-up and security keys. Internal

and external validity, monitoring of study rigour, need to be secured to avoid the threats so that the finding is confidentially disseminated and generalized.

The tricky confounders and bias are the threat in need to be dealt with during the design, sampling, data collection and data analysis. Eventually, data analysis procedures; data preparation and management, data analysis using univariate, bivariate and multivariate analysis are cascaded. As could be well noted in chapter 4 the Microsoft Office Excel 2007 and 2011 Epi-Info version 3.5.3 have been applied both for descriptive and analytic data analysis. The researcher also consulted the Statistician for the support of the analysis and interpretation of the findings, which is the aim of the next chapter where findings are described thoroughly in detail.

CHAPTER 4

ANALYSIS, PRESENTATION AND DESCRIPTION OF THE RESEARCH FINDINGS

4.1 INTRODUCTION

Constructing a good Logistic Regression Model needs good modelling strategy. A good modelling necessitates; good choice of the variables included in the multivariate logistic regression model, good choice of the coding of variables, appropriate assessment of interaction terms and appropriate assessment of the confounder variables. While presenting the assessment of logistic regression results; researchers should include sufficient information to address the following: an overall evaluation of the logistic model, statistical tests of individual predictors, goodness-of-fit statistics and assessment of the predicted probabilities (CDC, 2008:93). This is the principle followed in this chapter during the data analysis especially in multivariate analysis which is based on the purposive models of variable selection. In short, detail procedure of data analysis of univariate, bivariate and multi-variable is presented. The findings are discussed comparing and contrasting to the literature already reviewed. The discussion also includes the correlation among the study variables.

4.2 MODEL BUILDING STRATEGY: INCLUDING VARIABLES IN A LOGISTIC REGRESSION MODEL

Researchers can have more potential predictor's variables that end up in the final model. The key challenges in many models building is to choose from a large set of co-variables that

should be included in the “best” model. The variable selection procedure determines as to which explanatory variables will be included in a model. It could also help to decreasing the number of independent variables in multivariate analysis. Variables must be selected carefully so that the model makes accurate predictions, but without over-fitting the data (Katz, MH.2003:648).

During variable selection possible confounders and variables with suppressor effect are taken into consideration (Katz 1999:11; Hosmer and Lemeshow 2000:17). According to Katz ([1999:11), a suppressor effect is when variable may be statistically important when a variable (or group of variables) is in the model and yet not a significant when the variable (or group of variables) is not in the model.

Potential confounders are usually selected using “10% change in estimate” variable selection rule: a confounder is included in the model if it changes the coefficient or effect estimate of the primary exposure variable by 10% (Kulkarni et al 2006). Ideally, models should include all variables that have been hypothesized on theoretical grounds. Variables that have been shown in previous research to be confounders of the relationship being studied or those with a biological rationale need to be part of the model (Katz 2003:647).

Hosmer and Lemeshow (2000:17-18) also considered variables having a relationship with an outcome variable at certain level and a multicollinearity when selecting variables in to multivariable logistic analysis. Some authors explained that it is better to see the association and correlation between independent variables and exclude one of the pair of highly correlated variables before conducting multivariate analysis. If the two explanatory variables are correlated with each other, they can have a problem during multivariable analysis because they explain almost the same variability in the outcome (Vittinghoff et al 2005:140).

In this study variables having an association with an outcome variable at p-value of 0.25 are included in the multi-variable analysis. A p-value of 0.25 is usually selected because the traditional level of p-value of 0.05 can fail in identifying variables known to be paramount (Bendel and Afifi 1977:46; Mickey and Greenland 1989:125). Vittinghoff and his colleagues (2005:140) explain that including only variables that are statistically significant at p-value of 0.05 or lesser are not recommended due to the substantial and potential residual confounding in such model.

Another important issue during variable selection is the need to consider intervening or intermediate variables. The intervening variables, unlike confounders, occur on the causal way to an outcome (Katz 2008:644). Adjusting the intervening variables in the case of confounders will adjust the effect away from the effect one is trying to demonstrate. Thus, one has to identify the intervening variable based on prior researches or biological plausibility (Katz 1999:10-11).

Based on Bursac, Z, Gauss, CH, Williams, DK and Hosmer, DW (2008:2), six methods of variable selection in multivariate logistic regression to control confounding are dealt with.

4.2.1 Forward Variable Selection

For forward stepwise selection, the variable with the strongest association with the outcome is entered first, followed by the next strongest, until all variables that are related to the outcome (at a significance level specified by the investigator) are entered into the model (Bursac 2008:2). Any variable that has been entered into the model but that is no longer significant when the other variables have been added to the model will be sequentially deleted (Katz 2003:648).

4.2.2 Backward Variable Selection

For backward deletion, all variables are entered into the model and are sequentially deleted starting with the variable having the weakest association with the outcome and continuing until the only variables left in the model are those related to the outcome (at a significance level specified by the investigator) (Katz 2003:648). This helps to detect the effect of suppressor variables as compared to the forward variable selection (Bursac 2008:10; Katz 2003:648). Yet, forward selection is preferred over backward selection when one's sample size is small. In both models a variable that is important in explaining an outcome could still be kicked out of the model (Katz 2008:648-649).

4.2.3 Stepwise Selection

According to Katz (2003:648), in the stepwise selection effects are entered into and moved from the model in such way that each forward selection step may be followed by one or more backward elimination steps. This is terminated when no further effect can be added to the model. Stepwise selection method is the most widely used technique in modelling applications.

But stepwise selection technique has serious drawbacks and often criticized severely for instability and bias in logistic regression coefficient estimates, their standard errors and confidence interval (Harrell 2001).

4.2.4 All Variable Model

The above variable selection methods produce models with a smaller number of independent variables. They have important limitations, however. They may not be able to tell whether all important confounders have been included in the model (Katz 2003:648).

To eliminate this possibility, the investigators should have rerun the analysis with all variables in the model (their sample size was large enough), named as “ all variable model” (Katz 2003:648). Including all variables into the model does not follow the aforementioned variable selection algorithm. All variables that are specified by the analysis will be entered simultaneously. According to Katz (2003:648-650), one won't worry about the possibility of missing suppressor effect or important changes in the coefficients caused by exclusion of the modest confounders. Katz (2008:648) also mentioned that in the above models the variables that are retained in the model are not necessarily clinically more important than the variables that are excluded.

4.2.5 Best-subset

In this model the subset of variables that maximizes the specifications chosen by the investigator are entered into the model (Katz 2003:648).

4.2.6 Purposeful Variable Selection

Hosmer and Lemeshow (2000) describe a purposeful selection of covariates algorithm within which an analyst makes a variable selection decision at each step of the modelling process. It is based on the following steps: (1) starts with a bi-variable analysis of with each covariate, (2) select as candidates for a multivariate model those significant at some chosen alpha level, (3) identify those variables that are not significant in the multivariate model at some arbitrary alpha level, (4) fit a reduced model and evaluate confounding by change in parameter estimates, (5) repeat steps 3 and 4 until the model contains significant covariates and/or confounders and (6) add back in the model, one at a time, any variable not originally selected, keep any that are

significant, and reduce the model following steps 3 and 4. At the end of step 6, the analyst will have a “main effects model.” According to Bursac et al (2008:12), this step can be helpful in identifying suppressor. Eventually, the analyst is left with the preliminary main effect model.

This method is usually used when one is interested in not only in predictor identification but also in risk factors. It retains both significant covariate and important confounding variables which makes it a rich model (Bursac 2008:5).

However, Sarkar SK, Midi H, and Rana S (2010:2813) showed that the purposeful selection of covariates does not provide efficient model in case of large number of covariates while mechanical stepwise and best subsets selection procedures still provide a useful and effective model selection tools.

4.3 CODING AND CATEGORIZING OF VARIABLES

The coefficient for a predictor variable depends on how that variable is coded (Bagley, White and Golomb 2001:983). Per the recommendation of Hatz (2008:646), to incorporate nominal variables into a multiple model many nominal variables are transformed into multiple dichotomous variables.

Accordingly, numerically coded nominal independent variables such as religion, highest educational level, average monthly income, partner fertility desire, participants' fertility desire and intention, use of contraceptive in this study were transformed to reflect a meaningful order. The data average monthly income was collected with 8 categories with detailed ranges of income. For the convenience of data analysis this was reduced to four categories (<1000 birr/\$56, 1000birr/\$56-2999 birr/\$167, >=3000/\$167 and no income or unknown income). Fertility desire and intention of participants and their partners were also coded as desires/intended fertility as ‘1’ and absent fertility desire/intention as ‘0’. This is also for the easy to compute the logistic regressions. Same code was applied for use of contraceptive (1) and non reported use of family planning (0) by both the participants and their participants.

While analyzing the data for categorical variables with contingency tables, particular attention was given to cells with low counts which were in need to be collapsed into categories in a sensible fashion; for instance; religion, knowledge of partner HIV status, fertility intention,

partner fertility desire, use of contraceptives. The Catholics and other minority religion reported were lumped up due their smaller number (17 for Catholics and 6 for other religions) and for easy of data analysis. Thus, the 5 categories of religion were reduced to 4 categories. Initially, the knowledge of partner HIV status was numerically recoded into “yes” and the separately collected and coded “no” and “I don’t know” categories were recorded to “no or I don’t know”. For the dependent variable, dichotomous variable were created.

The data of fertility desire was also initially collected and numerically coded as “yes”, “no”, “I don’t know” and “no response”. The respondents for the last two answers were 4 and 1 respectively which were lumped up to “no” response. Thus, the participants and their partners’ fertility desire were recorded into two easily analyzable outcome variable as “yes” (1) and “no” (0). The intended fertility was also numerically coded as “no intention”, “one”, “two”, “three” and “more than three” as 5 categories during data collection. Responses other than the “no intention” were categorized as “intended”. Again, as one of the outcome variable fertility intention was also recorded as “no intention” (0) and “intended” (1). Similarly, the numerically coded 3 categories of use of contraceptive was also recoded into “yes” and “no”. The initial three categories were reported use of contraceptive, no use of family planning and pregnant, and no use of contraceptive. The data for educational status was collected based on the Ethiopian ministry of Education policy classification (Grades; 1-4, 5-8, 9-10, 11-12, college/university). Based on the literature reviews and EDHS 2011 the four categories of educational level; unable to read and write, primary and junior, high school and college and University are used for descriptive part. This was again recoded and classified into below high school, and high school and above for easy of analysis.

On the other hand, other variables were categorized and coded based on the previous literature review, 2011 EDHS categories, the median or/and mean and percentile results. This was applied for numeric, discrete and continuous variables. They are the number of household family size, over all reported births during the survey, number of births experienced after HIV diagnosis and after initiation of ART, durations after HIV diagnosis, duration of ART and duration in relationships. Based on the EDHS 2011, family size in the household were categorized as 1-3, 4-6, and more than six (Central Statistical Agency [Ethiopia] and ICF International 2012:75). The other category was coded as 1-3 and more than 4 based on the literature review (Loutfy et al 2009:4). This category is used for analysis throughout the report.

The overall reported births were coded as no birth, one birth and two or more based on the EDHS 2011(Central Statistical

Agency [Ethiopia] and ICF International. 2012:73&84). The other category was 0-2 births and two or more than two was based on both the median (which was 2 births) and the literature review (Loutfy et al 2009:4). The codes and categories for number of births after HIV diagnosis and after ART initiation were based on whether there was birth experienced or not. This classification is used throughout the analysis as well.

Duration after HIV diagnosis (1-24 months, 25-38 months, 39-60 months and more than 60 months), duration on ART(1-20 months, 21-33, months, 34-48 months and 49 and more) and duration in relationship(1-6 years, 7-11 years, 11-15 years and 16 year and more) were categorized based on the their mean and percentiles. Based on literature review; however, duration after HIV diagnosis and after ART initiation were re-classified as less than 11(0) months and 12 months(1) and more and duration in relationship was re-categorized as 11 years (1) and 12 years and more (0) (Cooper et al 2009; Olufemi 2005).

4.4 ADDRESSING INTERACTION (EFFECT MODIFIERS)

Interaction means that the odds ratio (OR) for a variable varies with the value of another variable. Interaction must be addressed early in forming a model, because the model must contain all single variables that are found in significant interaction terms to be hierarchically well structured (Katz 1999:13). When one predictor is a risk factor, it is important to determine if interactions are presenting in a model. Interactions are specified by cross-products in logistic models (Peng and SO 2002:42). For example, if two explanatory variables are involved in a significant interaction, we can no longer talk of the “effect” of one without fixing the level of the other - the effect of one variable depends on the level of the other (CDC 2006:81-85). In short, the presence of interactions poses more of a challenge in interpreting the logistic regression model (Katz 1999:13).

As described well in chapter 3, uni-variable, bi-variable and multivariable analysis are performed stepwise in this study. Descriptive statistics are applied under uni-variable analysis.

Bi-variable analysis was performed with fertility desire and intention with all the independent variables. During the bi-variable analysis significant association were explained and related compared with other similar research findings. Stratification was carried out to look for possible confounding variables and effect modifiers during the bi-variable analysis. Associations between nominal variables were tested by chi-square and p-value. The relation between categorical and a continuous variable was assessed by t-test.

4.5 OVERALL MODEL EVALUATION: HOW GOOD IS THE MODEL?

A logistic model is said to provide a better fit to the data if it demonstrates an improvement over the intercept-only model (also called the null model). An improvement over this baseline is examined by using three inferential statistical tests: the likelihood ratio, score, and Wald tests (Peng and So 2002:43). According to CDC (2006:98), the likelihood ratio test is the more robust of the two and is generally to be preferred. It is the deviance without any predictor in the model minus the deviance with all predictor in the model. "The associated p-Value is calculated based on the Wald test. The Wald statistic is calculated from the coefficient divided by the standard error. This is a Z-statistic that, when squared, is a chi-squared statistic with one degree of freedom for which the p-value can then be determined" (CDC, 2006:98). The score test is based on the distribution of the deviation of the fitted model's likelihood function (Peng and So 2002:42).

4.5.1 Goodness-of-fit Statistics

The goodness of fit of a statistical model describes how well it fits a set of observations. Measures of goodness of fit typically summarize the discrepancy between observed values and the values expected under the model in question (Daniel 2009:597). Pearson's chi-squared test and p-value use a measure of goodness of fit (Peng and So 2002:43). Goodness-of-fit statistics assess the fit of a logistic model against actual outcomes (Daniel 2009:598).

4.5.2.1 The Likelihood Ratio Test

According to Peng and So (2002:42) likelihood ratio test is a statistical test used to compare the fit of two models, one of which (the null model) is a special case of the other (the alternative model). The test is based on the likelihood ratio, which expresses how many times

more likely the data are under one model than the other. This likelihood ratio, or equivalently its logarithm can then be used to compute a p-value (Peng and SO 2002:42-43). When the logarithm of the likelihood ratio is used, the statistic is known as a log-likelihood ratio statistic (CDC, 2006:101). According to Daniel (2009:199), the Likelihood Ratio Test statistic is a measure of the goodness of fit of a model, judged by whether an expanded form of the model provides a substantially improved fit.

4.6 LOGISTIC REGRESSION MODEL BUILDING STRATEGY: STEPS USED IN THE STUDY

In reality, there is no one supermodel which is good for all purposes. Even in the same study it might often need two types of models, one for interpretation and another for prediction (Sarkar, Midi and Rana 2010:5816).

In this study the purposive variable selection model is applied. Thus, the following procedure is followed during the variable selection and multi-variable analysis. This is to come up with the determinant and risk factors of fertility desire and intention study.

Step 1: Identify the variables to be considered through analysis of uni-variable, bi-variable and stratified analysis. Independent variables associated with the dependent variables (fertility desire and intention) are identified at $p\text{-value} < 0.25$.

Step 2: Independent variables related strongly to one another are found. There is an analytical simple stratified and logistic regression among the independent variables.

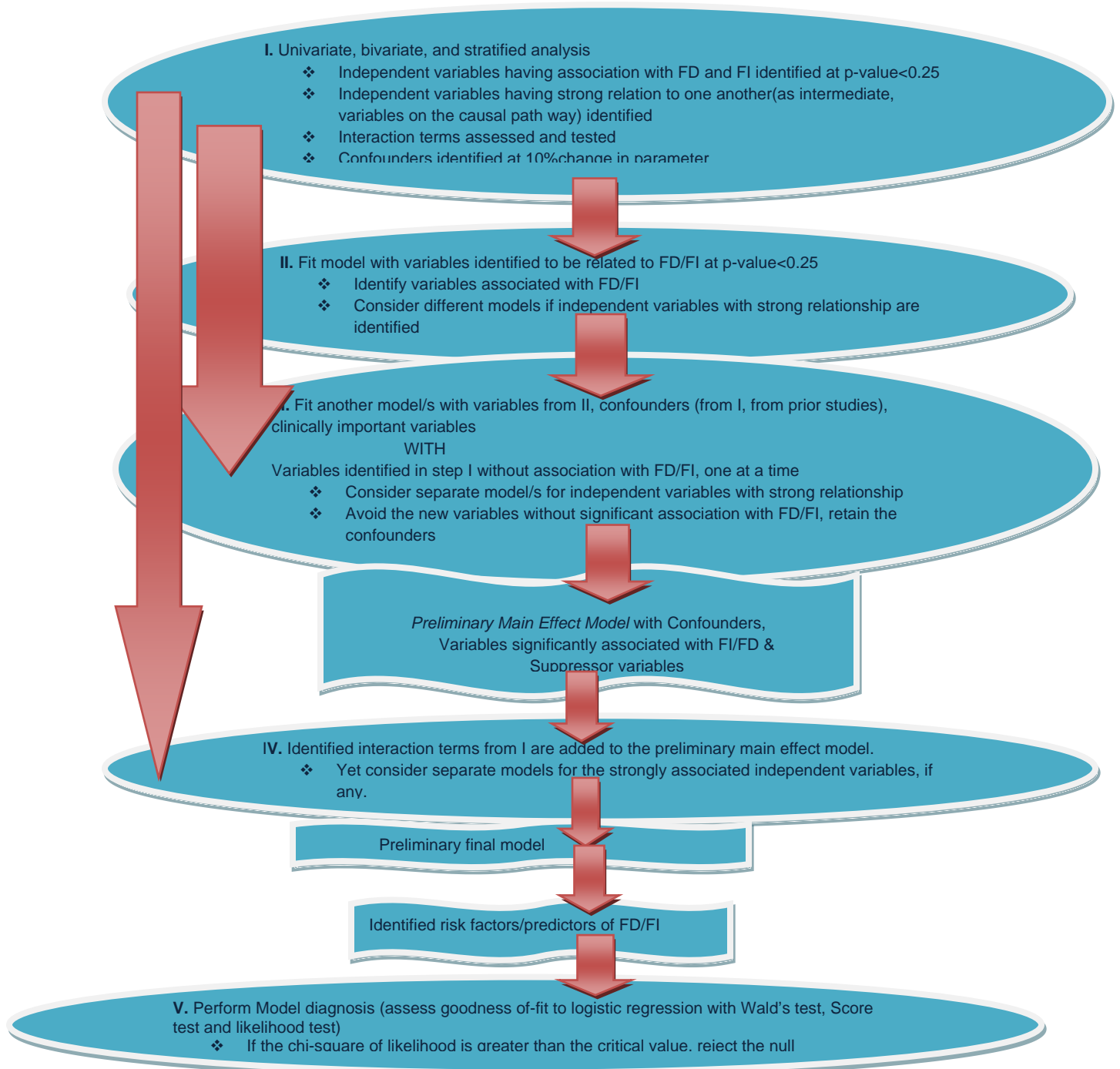


Figure 4.1: Flow chart of building model for multivariable logistic analysis based on the purposive variable selection.

Step 3: Fit a multiple logistic regression model using the variables selected in step 1.

Now a coefficient of the each variable with the coefficient from the model containing only that variable (null model or original mode without predictor) is compared. Any variable that doesn't appear to be important, and fit a new model is eliminated based on the Walds test (p-value

less than 0.25). This process of deleting, refitting and verifying was repeated until it appears that all the important variables are included in the model.

Step 4: the variables that were not selected in the original multiple model are added, one at a time. The joint significance of the variables that were not selected is assessed. This step was important as it helped to identify the confounding and suppressor variables. Variables with known clinical importance were also considered though not significantly associated with the fertility desire an intention. Eventually, variables left in these models at this level are the preliminary main effects model-- variables with significant association with fertility desire and intention and the confounders as well as suppressor variables.

Step 5: Evaluate the confounders at the 10% change in the co-efficient. In addition, variables which were possibly acts as a confounder from literature review are included in the model

Step 6: Check for interactions. Lists of possible pairs of variables in the main effects model having some scientific basis to interact with each other were created. Significance using the likelihood ratio test was assessed. Doing so the significant interaction terms were identified (CDC 2006: 81-85)

Step 7: Add the interactions found significant in step 4 to the main effects model and evaluate its fit. The Score and LR (likelihood rate) tests were looked at for the interaction terms. Any non-significant interaction terms were dropped. At the end, we got our preliminary final model.

STEP 8: Assess the overall goodness-of-fit of this model and perform model diagnostics. The fit statistics that are available for regression models was -2 log likelihood. This was done by Likelihood test, Walds and Score tests in the final models. If the chi-square of likelihood test is greater than the critical value the null hypotheses (the new model is same and not better than the original model without a predictor), is rejected.

All covariates were selected as a risk factor or predictor if statistically significant at p-value<0.05. Odds ratios were interpreted as adjusted odds ratios because there are multiple independent variables in the model.

Step 9: Compare results of bivariate and multivariate logistic regressions

To understand how much adjustment matters, it is helpful to compare the odds ratio from the bi-variable and multi-variable regression models using summary table comparing the differences between Crude Analysis (Bi-variable Logistic Regression) and Adjusted Analysis (Multivariable Logistic Regression) (CDC 2006: 98).

4.7 RESEARCH RESULTS: BIVARIATE ANALYSIS

4.7.1 Socio-demographic Characteristics of the Study Participants

4.7.1.1 Age of the Participants Based on Gender (N=460)

The mean and median age of the study participants were 33.42 years and 33.0 years respectively. The age range is 37 years (17-54 years). The mean age for male participants is 36 years with standard deviation of 5.88 years. For female the mean is 31 years with the standard deviation of 6.33 years. The mean difference in age for male participants as compared to the females is 4.94 years; male respondents older by 4.94 years on average at 5% level of significance (t-test=8.67 & p-value=0.00).

About 88.2% (406) of the study participants were in the age range of 25-44 years, 49.1% (226) in age range of 25-34 years and 39.1% (160) in age range of 35-44 years. A few of the other participants were either in the lower age range of 15-24years, 26 (5.7%), or in the higher age range of 45-54 years, 28(6.1%).

4.7.1.2 Age of the participants based on their area of residency (N=460)

TABLE 4.1: MEAN, MEDIAN, STANDARD DEVIATION AND RANGE OF AGE OF THE STUDY PARTICIPANTS STRATIFIED BY RESIDENTIAL AREA, HAWASSA 2012.

Residence	Mean	Median	SD	Range
Rural (N=69)	35.57	35	7.33	24-54
Urban (N=391)	33.04	32	6.38	17-54
Total (N=460)	33.42	33	6.59	17-54

The mean and the median age of rural participants were 35.57 years and 35 years respectively with standard deviation (SD) of 7.33 years. These figures are 33.04 years and 32 years for the urban study participants with the SD of 6.38 years. The age range for the rural dwellers was 30 (24-54) years. For the urban it was 37 (17-54) years. See table above. The mean difference in age for rural participants compared to urban participants was 2.53 years; urban respondents were younger by 2.53 years on average at 5% level of significance (t -test=2,96 & p -value=0.003).

4.7.1.3 Gender of the study participants (N=460)

A total of 460 PLHIV from the three health facilities in Hawassa city with chronic HIV care were interviewed. Equal number of males (230) and females (230) involved in the interview. As can be seen in the figure below the majority of the study subjects (291, 85%), reported to come from urban areas while 69(15%) of them said that they were from rural area.

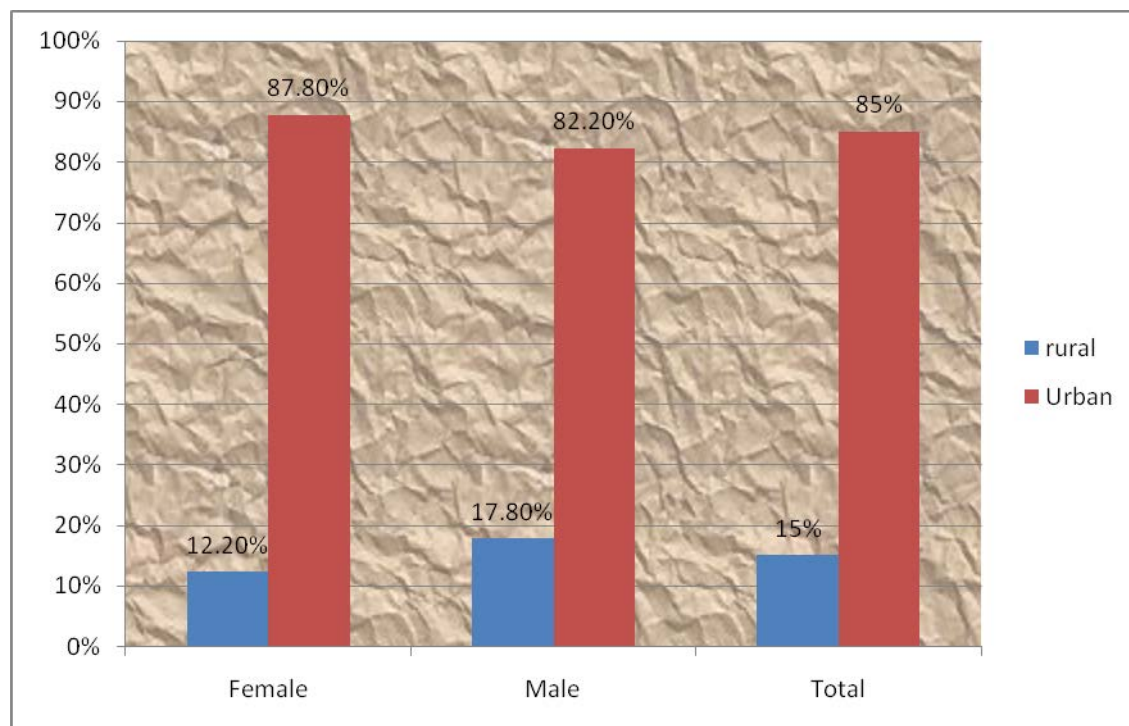


Figure 4.2: Bar graph showing the proportion of gender stratified by residence (Rural: N=391; Urban: N=69) in Hawassa city, 2012.

Twenty-eight (12.2%) of the females and 41(17.8%) of the males participants were reported to be from rural areas. About 88 % of females (202) and 82.2% of males (189) participants were reported to be from urban areas. Proportion of males in rural residents (59.4 %, 41) exceeded the male urban proportion of 48.3 % (189); whereas, the proportion of female participants in rural area (40.6% 28) less than the proportion in the urban (51.7% 202) though not statistically significant at 5% significant level(chi-square= 2.88 & p-value=0.09).

4.7.1.4 Ethnic Group of the study participants (N=460)

There were a number of ethnic groups involved in this study. Sidama (23.30%) and Amhara (23.50%) were the major tribes' participated. This was followed by Wolayita (18%), Oromo (15.70%) and Guragie(7.2%). Kambata, Hadiya, Gamo and Gedo had attributed to 2.2%, 2.0%, 1.0% and 0.7% respectively. Tigre, Burji, Seltie, Halaba etc were combined under the category of "other" which were computed to be 6.1%.

4.7.1.5 Religious Affiliation (N=460)

Orthodox (206, 47.0%), and protestant (204, 43.0%) were the two major religion groups reported by the participants. Muslim and Catholic participants had attributed to 5.2 % and 2.6% respectively. In the reported rural areas, Protestant accounted for 63.8% (63.4% for males and 64.3% for females). The Protestants accounted for 41.0 % (160) in those participants from urban (41.8% for males and 40.2 % for females). Orthodox accounted for 49.9 % (195) in urban participants (male: 47.6 % & female: 52 %) and only 16.0 % (11) (females: 10.7 % & males: 19.5 %) in those from the urban.

TABLE 4.2: SHOWING THE DISTRIBUTION OF RELIGION OF THE PARTICIPANTS BASED ON THE RESIDENT AND GENDER AT HAWASSA CITY, 2012 (Urban: N=391; Rural: N=69 Total=460).

Category of Religion	Rural		Urban		Total
	Female	Male	Female	Male	
Orthodox	3	8	105	90	206 (47.0%)
Protestant	18	26	81	79	204 (43.0%)
Muslim	1	1	11	14	27 (5.2%)
Catholic	3	6	3	5	17 (2.6%)
Others	3	0	2	1	6 (2.20%)

4.7.1.6 Marital relationship of the study participants (N=460)

Three hundred and fourteen participants (68.3%) reported that they were married. Those who were never married singles, widowed, divorced and non-married partners accounted for 31(6.7%), 53(11.5%), 50(10.9%) and 12 (2.6%) respectively. Near to 326 (70.9 %) of study subjects were in relationship, either married or non-married partners. One hundred thirty-four (29.1 %) of them were not in any form of relationship; divorced, widowed or never married singles.

The proportion of study participants in a relationship in rural area (79.7%) is more than their proportion in the urban (69.3 %) though not statistically significant at 5% significant level (Chi-square=3.03 p-value=0.08). More of the males participants 183(79.6%) were in relationship as compared to the 143 (62.2 %) of the female and it is significant at 5 % level (Odds Ratio (OR): 2.7 95% CI 1.56-3.60, p-value=0.00).

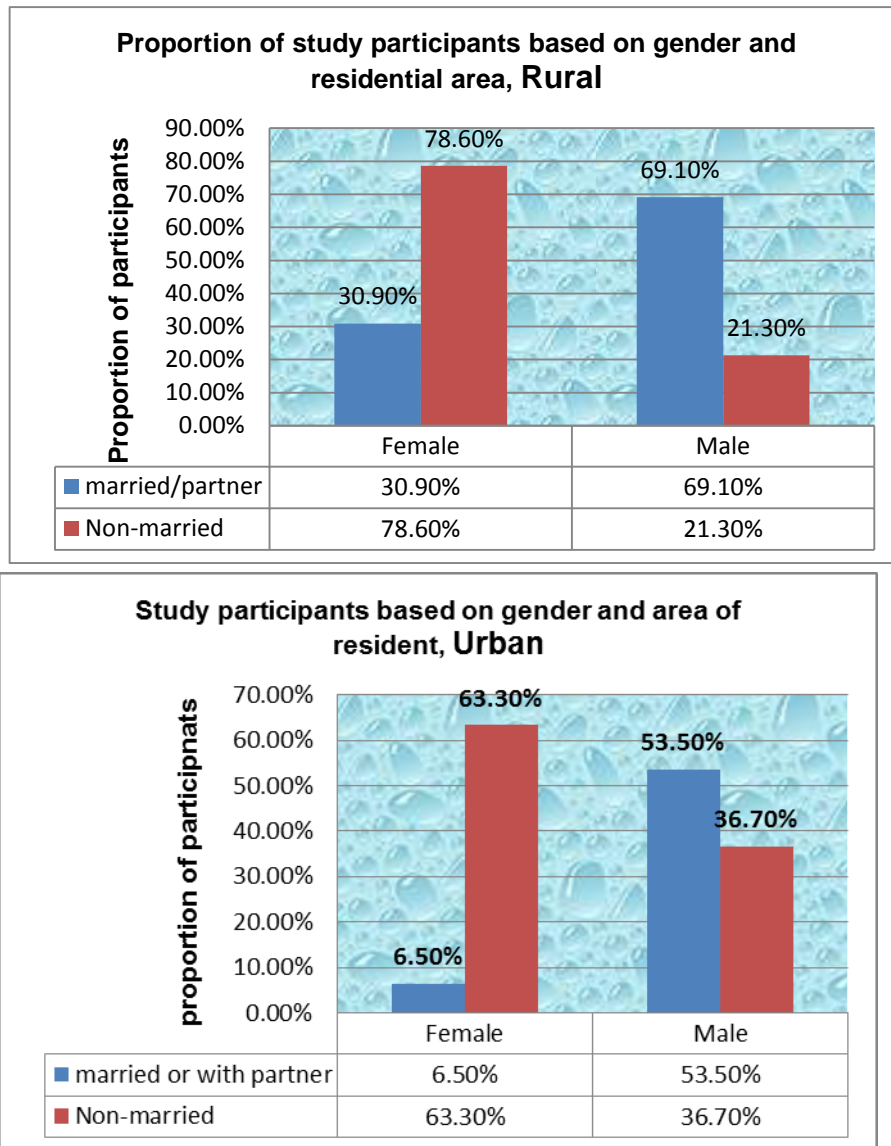


Figure 4.3: Sex and residence stratified marital relationship of the study participants (Rural: N=69, urban: N=391) in Hawassa city, 2012.

In both rural and urban, female were more likely to be in no relationship (never married single, divorced or widowed) as compared to the male. Females are 2.3 times more likely not to be not in relationship as compared to the males (Odds ratio(OR):2.31 95% CI 1.53-3.53, p-value=0.001).

4.7.1.7 Educational Level of Study Participant (N=460)

The majority of the study participants (88.7%) had reported to attend at least a primary school (literate). About 11 % of the participants (52) were illiterate, could not read and write.

Forty-five percent of the participants reported they had attended 1-8 grades (Primary & Junior School). High school and college or University level of education were reported to be attended by 30% and 14% of the respondents respectively. See table below.

TABLE 4.3: EDUCATIONAL LEVEL OF STUDY PARTICIPANTS BASED ON GENDER IN HAWASSA CITY, 2012 (N=460)

Education level	Male	Female	Total
	Number (%)	Number (%)	Number (%)
Unable to read and write	13(5.7)	39(17)	52(11.3)
Primary & Junior School	95(41.30)	111(48.3)	206(44.8)
High School	75(32.6)	63(27.4)	138(30)
College & University	47(20.4)	17(7.4)	64(13.9)

Female and rural respondents were more likely to attend 8th grade and lesser educational levels as compared to the males and urban participants. That is male respondents were more likely to attend a high school or college/university as compared to the females (OR= 2.12 95% C.I. 1.46-3.08 p-value= 0.0001). Rural men were also reported to be more likely to attend secondary and higher education as compared to the rural women though the proportion is low (18 % versus 11%). The proportion of urban participants who reported to attend at least a high school (47.6%) were greater than that of the rural respondents (23.2%)(Odds ratio(OR): 3.01 95%CI 1.67-5.44, p-value=0.0003).

4.7.1.8 Occupation of the Participants (N=460)

Ninety three of the participants (20.3%) were merchants. About 34 % of the respondents had already been employed (governmental, private or house maid). However, 43(9.4%) of them were not employed and 79(17.2%) were housewives. Peasants, daily labourers, commercial sex workers and student accounted for 5.2 %, 10.9 %, 0.9 %t and 0.7 % respectively. Ninety three (40.43%) and 53(23.04%) of the male and females were reported to be employed

somewhere, and unemployed males and females were computed to be 52(22.61%) and 26(11.3%) respectively (Chi-square = 100 p-value=0.00).

4.7.1.9 Residence of the Study Subjects (N=460)

Three hundred and ninety-one of the participants (85%) were reported to dwell in the urban area and 69 (15%) said they were living in rural areas. It can be seen in figure below that 52% and 48% of the urban resident were females and males respectively. Rural participants were composed of 28 (41%) of males and 41(59%) of females.

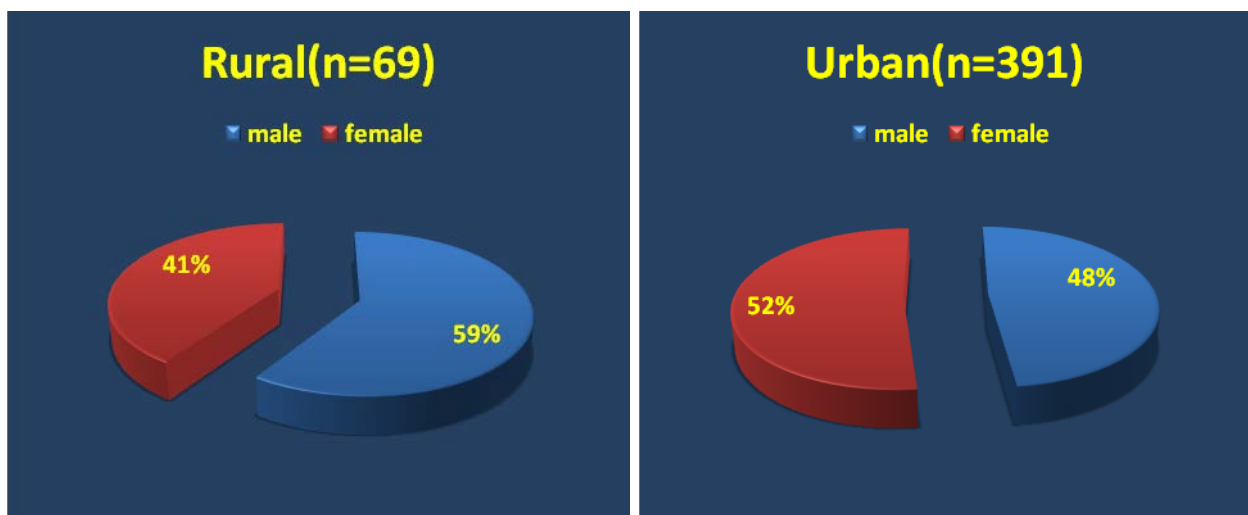


Figure 4.4: Pie chart showing distribution of residence of study participants based on their sex in Hawassa city, 2012.

4.7.1.10 Income of the Study Participants (N=460)

Estimating the valid average monthly income was difficult. Some people has got different source of income yearly or quarterly. Specifically, estimating the average monthly income of a farmer, daily laborer, and merchant was not easy. That is why in the 47.5% of the participants the income is either unknown (15.5%), the participants reported to have no income (32%) or be dependent like when their profession is housewife , student etc.

This is very significant among the rural participants where 52(75.4%) reported that their average montly income is unknown or with no incomer as compared to their urban counter parts 166 (42.6%) (chi-square=25.53; p-value=0.0000).

TABLE 4.4: AVERAGE MONTHLY INCOME OF A HOUSE HOLD OF THE PARTICIPANTS STRATIFIED BY SEX IN HAWASSA CITY, 2012 (N=460).

Average Monthly Income in Household	Male Number (%)	Female Number (%)	Total Number (%)
No income or Unknown	100(43.5)	119(51.5)	219(47.5)
<1000Birr(\$56)	60(26.1)	77(33.6)	137(29.8)
1000-2999(\$56-166.62)	58(25.2)	29(12.7)	87(19)
>=3000(\$167)	12(5.2)	5(2.2)	17(3.7)
Total	230(0100.0)	230(100)	460(100)

As expected a higher proportion of males (30.4%) reported to earn at least \$56 per month as compared to the 14.9% of the females with same income (Chi-sqaure=16.14, p-value=0.001).

4.7.1.11 Family Size in the Household (N=460)

The median number of reported family size was 4 ranging from 1-14. The median number in rural and urban was 5 and 4 respectively. At 5% significant level, there is a significant mean difference of family size in rural and urban (t-statistic= 5.36; p-value=0.00); the mean for rural (5.7) is higher than the mean of urban (4.2). However, there is no significant mean difference in the family size among females and males (t-statistic=1.63; p-value=0.1). As seen in table below, more than half (50.8%) of the participants have 4-6 family size in a house hold.

TABLE 4.5: FAMILY SIZE OF PARTICIPNTS' HOUSEHOLD BASED ON RESIDENT AND GENDER IN HAWASSA CITY, 2012 (N=460).

House Hold Family size	Rural		Urban	
	Female	Male	Female	Male
one –three	6	4	81	69
four –six	14	27	99	96
more than six	8	10	22	24
Total	28	41	202	189

4.7.2 HIV and ART History

4.7.2.1 Duration after HIV diagnosis (N=460)

Close to 49% of the respondents had already known their HIV status at least for the last 48 months (4 years), 40.90% of them for at least 12 months. About 10.40% of them had known their status very recently (less than 11 months). Most of them (89.6%) had known their HIV status for last one year.

The average duration after HIV diagnosis in the participants was 45.74 months with SD of 30.34 months. The median of this duration is 38 months, 45 months for females and 36 for males. There is a bigger inter-quartile range of 167 months which is of also of the range for males; 1-168 months (see Table below). Yet there is no evidence that the average duration after HIV diagnosis was different between male and female (t-test=0.599, p-value=0.5495). Nearly 87.45% of males and 91.74% of females had already known their HIV status more than a year ago during the survey but with no significance difference between the two proportions (Odds ratio (OR):0.6241 95%CI 0.3392-1.1485; Chi-square =2.321, p-value=0.1276).

TABLE4.6: DURATION AFTER HIV DIAGNOSIS OF THE STUDY PARTICIPANTS BASED ON RESIDENT AND GENDER IN HAWASSA CITY, 2012 (N=460).

Duration after HIV Diagnosis (in months)	Rural		Urban	
	Female	Male	Female	Male
Mean	28.82	38.07	49.05	46.37
SD	21.5	20.2	31.22	31.36
Median	24	36	48	40
Range	95 (1-96)	95 (1-96)	142(2-144)	167(1-168)
	t-test=1.82 p-value=0.07		t-test=0.84 p-value=0.40	

The median duration after HIV diagnosis is 36 months for rural and 48 months for urban. There is an evidence that the mean difference in the duration after HIV diagnosis among the rural and urban is significant at 5% level (t-statistic= 3.43 and p-value=0.0007).

4.7.2.2 Status of ART Initiation (N=460)

Three hundred sixty-nine (80.2%) of participants interviewed had been already put on Anti-retroviral Therapy (ART) during the study period while 91(19.80%) of them were not. When disaggregated by sex, 80.4% of the females and 80.0% of the males were on ART. There is no significant difference between male and female participants based on their status of ART initiation (Chi-square= 0.0137, P-value=0.9068)

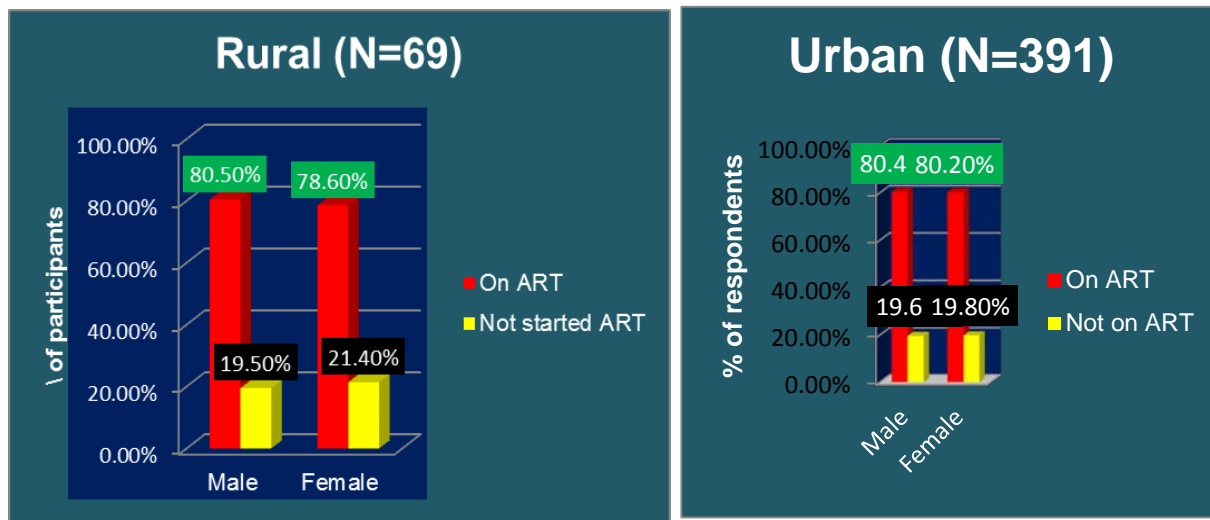


Figure 4.5: proportion of study participants who have started on ART and not started on ART disaggregated by their sex and area of residence in Hawassa city, 2012 (N=460).

As can be seen in the above figure, 80.5 % of rural males and 78.6 % of rural female reported to be taking ART during the study period. In the urban participants, 80.2 % of female and 80.4% of males reported to be on ART. However, there is no significant difference in the proportion of participants who were on ART based on their gender (Chi-square=0.014, p-value=0.91) and place of residence (Chi-square=0.013, p-value=0.91).

4.7.2.3 Duration since ART Initiation (N=366)

About 313 (79.6%) of the participants had taken ART for at least 12 months. Fifty three (11.5%) had taken ART for less than 11 months. Three participants started on ART on the date of the interview. The median duration since ART initiation was 33 months.

The average difference between duration after HIV diagnosis and duration on ART was computed to be 11.87 months (14.58 months for females and 9.18 months for males). The

median for this change is 6 months. Yet the mean difference is not significantly different between males and females (T-statistic = 1.8639, P-value = 0.0631).

4.7.2.4 Health status after initiation of ART (N=460)

Ninety-four percent (346/460) of the participants reported to be improved after ART initiation during the survey and there is no evidence that there is a difference between males and females with regards to their health status after ART initiation (Odds ratio (OR):0.43 95%CI0.43-2.40, p-value=0.98), 94% females responded improved and 94.1% of males also responded the same.

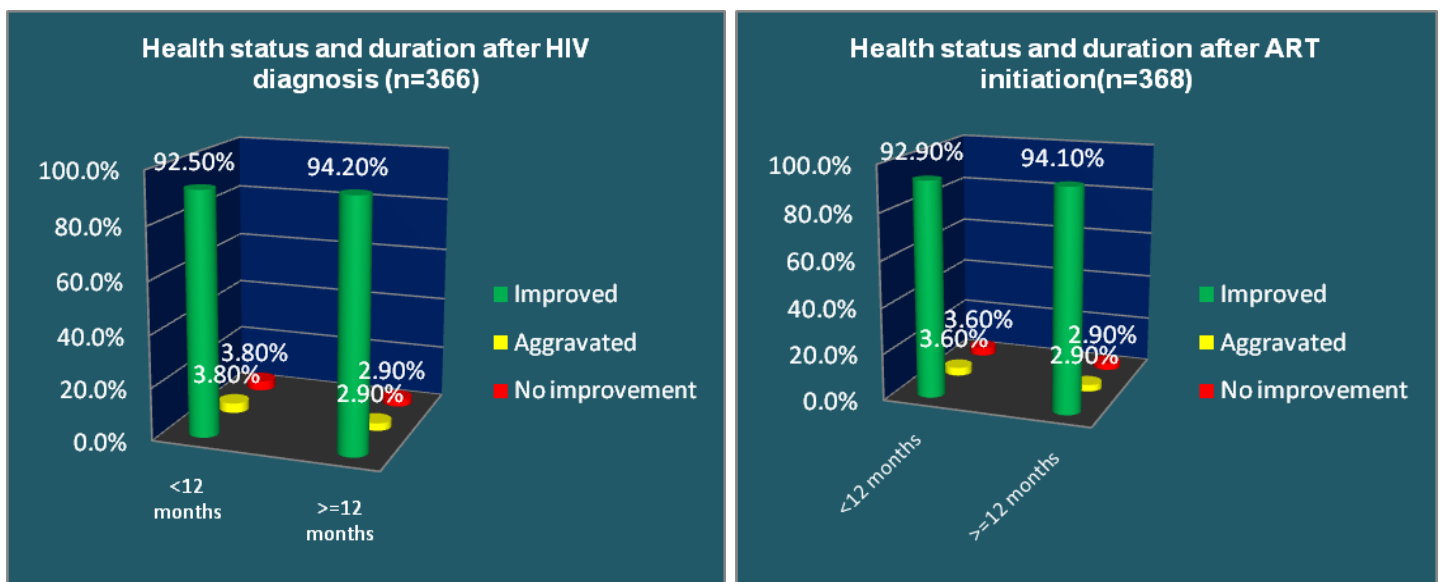


Figure 4.6: Health status of participants who had already been on ART during the survey disaggregated by duration after HIV diagnosis and ART initiation

As can be noted in the figure above, the reported proportion of improved health after ART is also higher irrespective of duration after HIV diagnosis (Adjusted odds ratio (AOR):1.23 95% CI 0.27=5.56; p-value=0.79) duration after ART initiation (Adjusted odds ratio (AOR):1.34 95% CI 0.43-4.12; p-value=0.61). Only 3.6 % of the rural and 6.4 % of the urban participants responded to be not improved or even aggravated after ART initiation. In addition, there is no evidence that the reported health status of the participants differed based on their area of residence (Adjusted odds ratio (AOR):55 95% CI 0.13-2.43; p-value=0.43).

4.7.3 Fertility History

4.7.3.1 Total/Overall births reported by the study participants (N=444)

Thirty-six (8.1%) of the respondents reported that they had no birth experienced thus far. Eighty-eight (19.8%) of them had reported to have one birth. Two and three births were reported by 24.8% and 18 % of the participants respectively. Around 29.3% of them said to have at least 4 children during the study period. In short, 72.1% of the respondents reported at least 2 children during the study period.

The mean of total births reported was 2.8 with standard deviation of 2.2. The median and the mode of the total births reported by the participants were same, 2 births and it ranges from 0-13 births. The mean for males and females was 2.8 and 2.9 births respectively with no significant statistical difference (t-statistics=0.62, p-value=0.53).

As expected the mean births of the rural respondents (4.5) is more than the mean birth (2.5) in the urban participants. The estimated mean difference in the number of births for rural compared to urban participants is 1.93; rural participants have higher number of births by 2 on average at significant level of 5 % (t-statistic=7.14, p-value=0.00). This can also be more evidenced where significant proportion of rural participants, 72.1% (49), reported to have already experienced more than two births as compared to the urban, 42.8 % (161) (Odds ratio (OR): 3.44 95% CI 1.95-6.08; p-value=0.00).

Participants with older age (Odds ratio(OR):1.13 95% C I 1.07-1.19; p-value=0.00), who attended 8th grade or less (Odds ratio(OR):0.52 95% CI 0.30-0.90; p-value=0.02) and higher family size (>four) (Odds ratio(OR):.41 95% CI 3.16-13.02; p-value=0.000) are more likely to have more births (>2 births).

4.7.3.2. Births after HIV diagnosis (N=444) and after ART Initiation (N=419)

Three hundred and thirteen (70.5%) of the respondents said that they did not have a birth after they were diagnosed with HIV infection. About 131 (29.5%) of them reported birth experience after HIV diagnosis. Overall, 159 births were reported after HIV diagnosis.

TABLE 4.7: FREQUENCY OF RESPONDENTS FOR NUMBER OF BIRTHS AFTER HIV DIAGNOSIS AND ART INITIATION IN HAWASSA CITY, 2012.

No of births	After HIV Diagnosis		After ART initiation	
	frequency	Percentage	Frequency	Percentage
0	313	70.5%	349	83.3%
1	109	24.5%	62	14.8%
2	16	3.6%	6	1.4%
3	6	1.4%	2	0.5%
Total respondents	444	100.0%	419	100.0%

About 83.3 % of the respondents responded that they had not had a birth after they started ART. About 70 (17%) of them reported that they had experienced at least a birth after ART initiation. It can also be computed that out of the totally reported 159 births after HIV diagnosis, 80 (50%) births were after ART initiation. See table above.

4.7.4 Partner Characteristics of Study Participants

4.7.4.1 Duration in Marriage or in Relationship (N=334)

Participants who were in relationship during study period reported to be together for the average of 10.88 years, with SD of 7.21 years ranging from 1 year to 37 years. The median and mode is the same, 10 years. The average duration in relationship reported by male respondents was 11.75 years which is greater than the 9.80 years report by the female respondents (t-test=2.48 and p-value =0.0137). Near to 40% of the respondents were reported to be in relationship with their current partner for the last more than 11 years and the rest (60%) lived together for 1-10 years.

4.7.4.2 Disclosure of HIV Status to Partner (N=331)

Out of the 331 participants responded to the disclosure of their HIV status to their partners, a significant proportion of them (96.4%) reported to tell their HIV status to their partner. Participants who had taken ART for more 12 or more months 223 (89.2%) were more likely to disclose their HIV status to their partner as compared to those who were on ART less than 12 months, 27(10.8%)(Odds Ratio (OR): 4.72, 95% CI 1.30-17.18, p-value=0.0186).

4.7.4.3 Knowledge of HIV Status of a Partner (N=331)

About 93% (308) of the respondents had reported that their partners were also tested for HIV. Near to 7% (23) answered their partner were not tested for HIV or they didn't know whether their partner was tested for HIV or not. Out of 328 participants, 237 (72.3%) reported an HIV+ve concordant result. Seventy (21.3 %) of them responded that their partner were HIV-ve discordant, and 21(6.4%) did not know their partners' HIV status. On aggregate, 93.6% of the participants knew the HIV status of their partner.

The longer period reported by the participants after their HIV status, the moiré likely that their partner were reported to be HIV +ve (Odds Ratio (OR):2.42, 95%CI 1.38-4.25, p-value=0.002). All those who disclose their HIV status had a concordant HIV positive partner.

4.7.4.4 Partner Fertility Desire (N=328)

About 40% (136) did respond that their partner wanted to have a child and 44.8 %(147) reported the opposite. The rest 13.7% (45) did response that they were not sure. Study participants with a younger age group were more likely to report that their partner desire to have a child in the future (Odds Ratio (OR):1.12, 95% CI 1.07-1.16, p-value=0.0000). About 90% (122) of the participants of urban residents reported that their partner desire to have a child 2.5 times more likely as compared to the 10.3% (14) of the rural (Odds Ratio(OR):2.5 95%CI 1.3-4.8 p-value=0.0043).One hundred four (76.5%) of participants who reported to live together for 1-10 years were more likely to report that their partner had a desire to have a child as compared to only 32 (23.5%) of those who lived together for more than 11 years (Odds Ratio(OR):0.28, 95% CI 0.17-0.46, p-value=00).

4.7.5 History of Family Planning

4.7.5.1 Use of Contraceptive by the Study Participants (N=460)

Nearly 54.0% (248) of the study participants reported that they had been using one of the family planning (FP) methods during the study period. About 45.2% (208) reported that they were not using any form of contraceptives, 4 were pregnant and reported not to using contraceptive. See the figure below.

Only 44.2% of female participants were responded to use a contraceptive as compared to 54.8% of the males. In general, males were 1.5 times more likely to use one of the contraceptive as compared the females (Odds Ratio (OR):1.5 95%CI 1.05-2.20; p-vale=0.025).

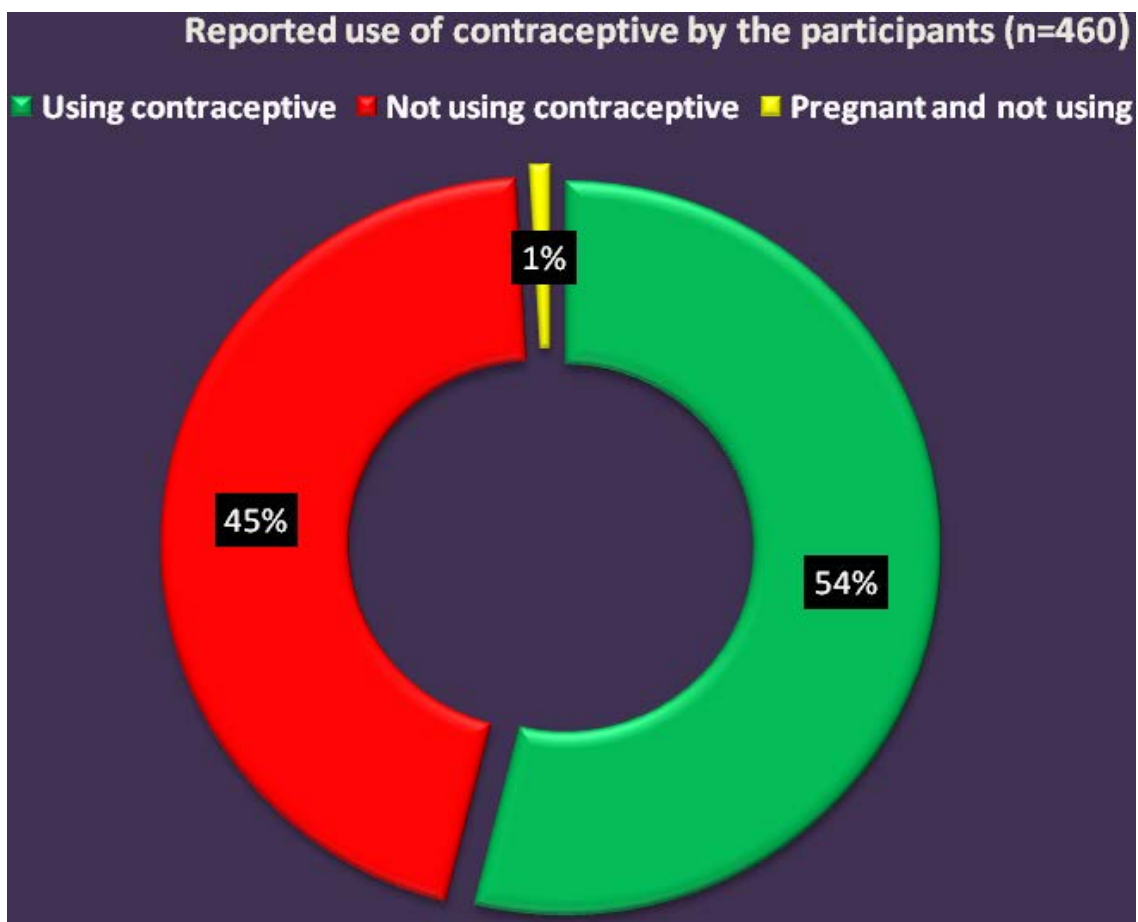


Figure 4.7: Doughnut chart showing status of reported contraceptive use by the study participants in Hawassa, 2012

Two hundred twenty-seven (69.6%) of those who were in relationship said to use one of the modern family planning as compared to only 21(15.7%) of those who reported not to establish any relationship (Odds Ratio(OR):12.34, 95% CI 7.32-20.80, p-value=0.00). One hundred fifty-seven (49.2%) of those who had no birth after they knew their HIV status were found to use one of a modern contraceptives. But the higher proportion, 92(70.2%), of those who had already a birth after HIV diagnosis reported to use a contraceptive. Moreover, respondents who had birth after ART initiation were twice likely to use a family planning (Odds Ratio (OR):1.88, 95% CI 1.09-3.22; p-value=0.023).Participants with partner who reported to desire

for childbearing were less likely to use family planning as compared to those whose partner were not willing to have a child in the future (Odds Ratio (OR):0.43, 95%CI 0.26-0.69, p-value=0.0005).

4.7.5.2 Use of Contraceptive by the Partner of the Study Participants (N=329)

It was also reported that 329 of the interviewees had answered whether their partners were using a contraceptive or not; 65.7% reported that their partners were also using a contraceptive. About 29 % of them said their partners were not using any form of contraceptive. Also 3.3 % partners of the study partners were not known whether using FP or not. Near to 136 (63.0%) male respondents reported that their partner were using a contraceptive as compared to 80 (37.0%) of females who said their partner were also using one of the family planning ((Odds Ratio (OR): 2.3, 95%CI 1.45-3.66, p-value=0.0004).

4.7.5.3 Types of Contraceptive Used by the Study Participants (N=270) and their Partners (N=222).

Condom alone was reported to be the method most commonly used in both the participants (67%) and their partners (55 %). Neither the participants nor their partners reported to use IUCD. Double contraceptive (a condom and one of the hormonal contraceptive) were reported by the 10.7% of the participants and 28.4% of their partners. Almost same proportion of respondents and their partners computed to use only injectable hormonal contraceptive (10.4% versus 10.8%). See table below. Moreover, not insignificant number of participants said that they were also abstaining, 9.3% among the respondents and 3.2% by their partners. Long standing contraceptives (injectables, Implants and sterilization) were shown to be used by 12.7% of the participants and 11.7% of their participants.

TABLE 4.8: THE REPORTED FREQUENCY OF TYPES OF CONTRACEPTIVES USED BY THE STUDY PARTICIPANTS AND THEIR PARTNERS IN HAWASSA CITY, 2012

No.	Types of Contraceptive	Used by respondents		Used by their partners	
		Frequency	%	frequency	%
1	Oral contraceptive	1	0.4	4	1.8
2	Injectable	28	10.4	24	10.8
3	IUCD	0	0	0	0
4	Implant	5	1.9	2	0.9
5	Abstain	25	9.3	7	3.2
6	Condom	181	67	122	55
7	Double contraceptive	29	10.7	63	28.4
8	Sterilization	1	0.4	0	0
Total		270	100	222	100

4.7.5.4 Condom Use by the Study Participants (N=270)

As noted above condom alone (67%) as well as together with others, double contraceptive (10.7%), was reported to be one of the mainly used contraceptives during the study period. In aggregate, 77.7 % of the study respondents were using condom as one of the modern family planning during the data collection period.

It seems that older aged participants were more likely to use condom as compared to the young (Odds Ratio (OR):1.08, 95% CI 1.03-1.135, p-value=0.0009). As expected, more male participants reported to use condom as compared to the females (Odds Ratio (OR): 7.05, 95% CI 3.53-14.09, p-value=0.000).Unexpectedly, participants from rural area reported to use condom about 7 times more likely than the urban respondents (Odds Ratio (OR): 7.25 95% CI 1.7-30.90, p-value=0.0074). Study participants who responded to attend at least a high school educational were three times more likely to use condom as compared to those attended lower educational level (Odds Ratio (OR): 3.2, 95% CI 1.6-6.33, P-value=0.001).

Eventually, it is also computed that 197 (84.2%) of those respondents who disclosed their HIV status to their partner reported to use condom as compared to only 3 (42.9%) of those who fail to disclose their HIV status to their partner (Odds Ratio (OR): 7.10, 95% C.I. 1.53-33.03, p-value=0.0125). About 53 % (194) of participants on ART were using condom as compared to 59.3 %t (54) of those not put on ART.

4.7.6 Fertility Desire (N=460)

The question “ Would you like or desire to have a child in the future?” was reflected by all the respondents. Two hundred and fifty-four (55%) of the participants reported that they would not like to have a child or another birth in the future. The number of participants who reported that they would desire to have a child in the future were 202 (43.9%). Only 5 (1.1%) of the study participants said that they could not tell or they preferred not to respond to the question. See figure below.

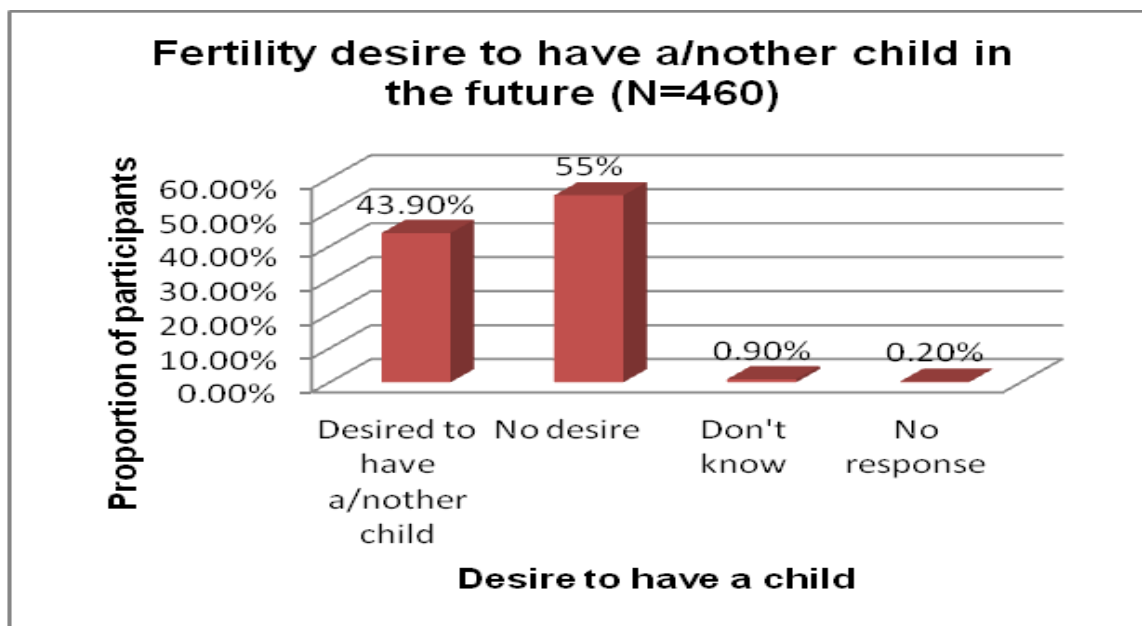


Figure 4.8: Bar graph showing proportion of respondents for fertility desire, Hawassa 2012.

4.7.7 Fertility Desire and Socio-economic Characteristic of the Study participants

4.7.7.1 Fertility Desire and Age of the Study Participants (N=460)

Fertility desire was reported by the high proportion of respondents in the age group of 25-34 years, 115 (56.9%). One hundred fourteen (44.2%) who responded not to desire to have a child

were from age group of 35-44 years. As the age category goes from 35-44 years to 45-54 years, the response for fertility desire fell from 66 (32.7%) to 6 (3%). See table below.

TABLE 4.9: FREQUENCY OF FERTILITY DESIRE BASED ON AGE CATEGORY OF THE PARTICIPANTS IN HAWASSA CITY, 2012 (N=460)

No.	Age Category	No desire		Desired		Chi-square	df	P-value
		Frequency	%	Frequency	%			
1	15-24	11	4.3	15	7.4	16.0495	3	0.0011
2	25-34	111	43	115	56.9			
3	35-44	114	44.2	66	32.7			
4	45-54	22	8.5	6	3			
5	Total	258	100	202	100			

There computed a negative association between fertility desire and age of the respondents (Odds Ratio (OR):0.93, 95% CI 0.91-0.96, R= -0.07, p-value=0.00). Study participants in the age ranges of 35-44 years and 45-54 years are 57.54 % and 80 % less likely to desire for a child in the future as compared to respondents within age range of 15-24 years.

4.7.7.2 Fertility Desire and Sex of the Study Participants (N=460)

Out of the 202 respondents who reported that they would like to have a birth in the future, 98(42.6%) were female and 104 (45.2%) were male. Though high proportion of female respondents (56.5%) seem to respond not to desire for a child in the future as compared to their male counterparts (53.5%), there is no evidence that there is statistical association between fertility desire and sex of the study respondents (Odds ratio (OR): 1.11, 95% CI 0.77-1.61, p-value=0.57). It can also be computed that fertility desire of the partners of males (37.5%) is less than the partner of females (46.5 %).

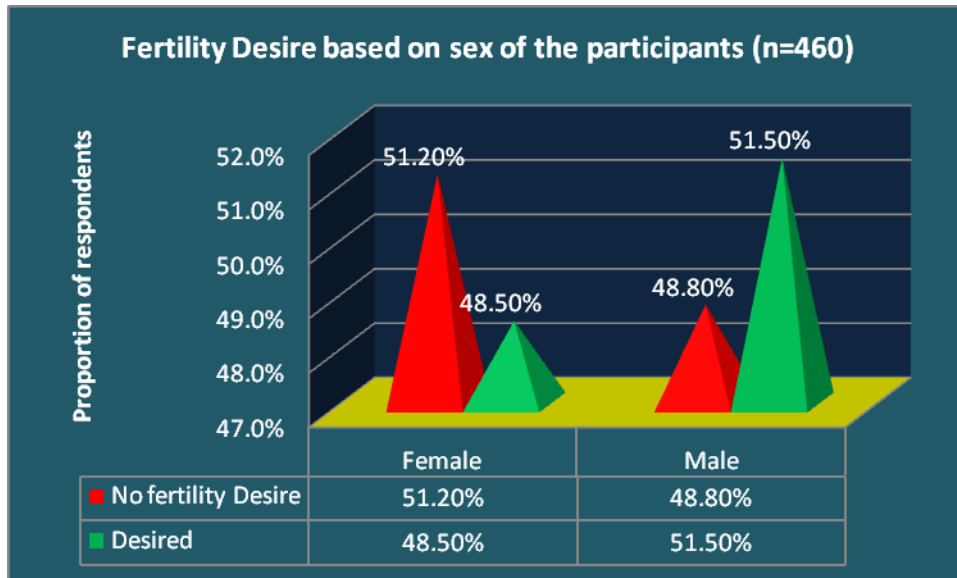


Figure 4.9: Bar graph showing fertility desire of study participants based on gender, Hawassa 2012.

4.7.7.3 Fertility Desire and Ethnic Category of Study Participants (N=460)

Forty-six (22.8%) of the desire to have a child was responded by the Amahara ethnic group followed by the 44 (21.8%) of Wolayita, the 42 (20.8%) of Sidama , the 29 (14.4%) of Oromo and the 14 (6.9%) of Guragie ethnic group. The least to respond were Tigre (4%), Kambata (2.5%), Gamo (1.6%), Hadiya and Siltie 1% each, Gedo (0.5%) and other ethnic groups (3.5%). Siltie(0.4%), Gedo(0.8%), Gamo(1.6%), Kambata(1.9%), Hadiya(2.7%), Tigre(3.1%), and other ethnic group(1.2%) shared the lower proportion to respond that they would not like to have a child in the future. However, Sidama (25.2%), Amhara (24%), Oromo (16.7%), Wolayita (15.1%), Guragie (7.4%), had relatively taken the higher proportion responding that they would not like to have a birth in the future. Yet there is no association between fertility desire and ethnic category of the study participants (Chi-square=10.14, p-value=0.52).

4.7.7.4 Fertility Desire and Religion of the Study Participants (N=460)

Eventhough the total number of participants with Catholic and other minor religions (23) was smaller, most of them (82.6%) responded that they did not desire for a/nother child. On the other hand, 14 (51.9%) of Muslim participants said that they did want to have a birth in the future whereas 98 (48%) of the Protestants and 86 (41.7%) of the Ortodox religion replied to have a/nother child in the future.

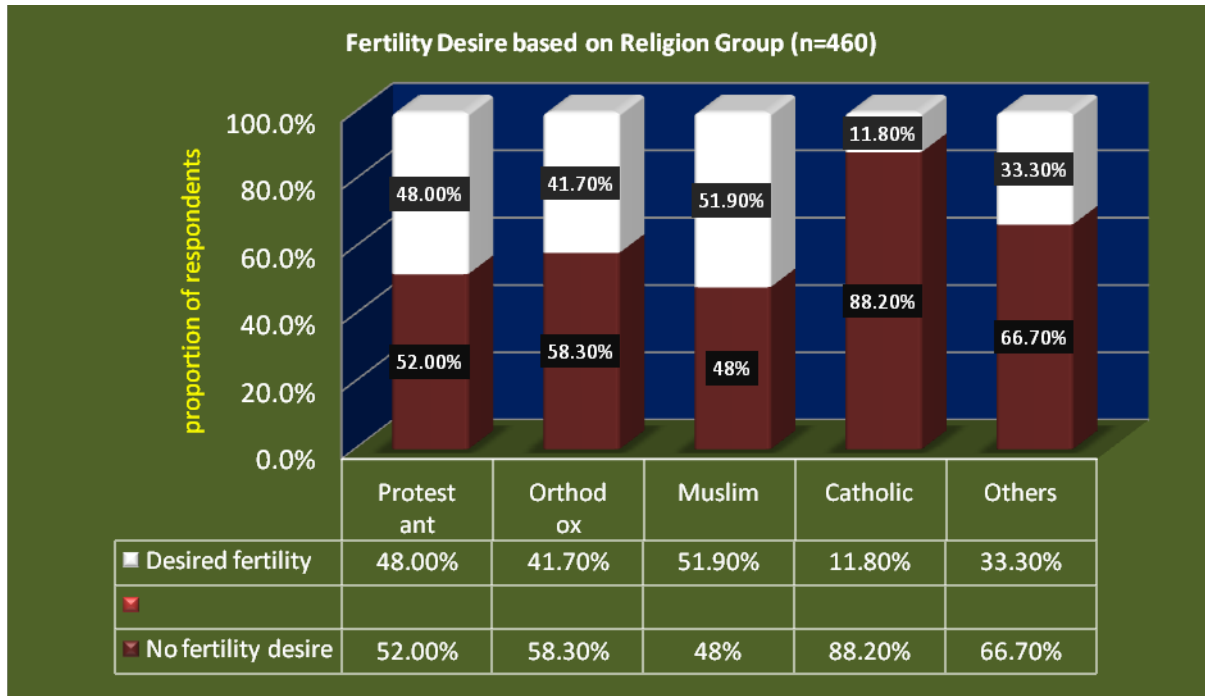


Figure 4.10: Proportion of fertility desire based on religion affiliation of the study respondents, Hawassa 2012.

Bivariate analysis showed that there is an association between religion of the participants and fertility desire. As compared to Catholic and other religions; Muslim, Protestants and Orthodox participants are more likely to respond to have a birth in the future. See table below.

TABLE 4.10: BIVARIATE ANALYSIS RELATING FERTILITY DESIRE AND RELIGION HAWASSA, 2012.

Term	Odds Ratio	95% C.I.	Co-efficient	S. E.	Z-Statistic	P-Value
Religion						
Muslim/Catholic and Others	<u>5.1154</u>	<u>1.3717</u> <u>19.0763</u>	1.6323	0.6715	2.4306	<u>0.0151</u>
Orthodox/Catholic and Other	<u>3.4042</u>	<u>1.1183</u> <u>10.3623</u>	1.225	0.568	2.1569	<u>0.031</u>
Protestant/Catholic and Others	<u>4.3915</u>	<u>1.4435</u> <u>13.3604</u>	1.4797	0.5677	2.6066	<u>0.0091</u>
CONSTANT	*	* *	-1.5581	0.5501	-2.8325	<u>0.0046</u>

However, this relation is computed to be confounded by the partner fertility desire.

4.7.7.5 Fertility Desire and Marital Relationship of the Study Participants (N=460)

As anticipated more proportion of never married single respondents (67.7%) and non-married partners (83.3%) responded willing to have a child in the future. The least proportion of fertility desire was reported by participants who were widowed (18.9%). In fact, the highest number of married participants (139) responded that they would like to have a child in the future. About 44% of divorced participants would like to have a birth in the future. See table below.

TABLE 4.11: FERTILITY DESIRE AND MARITAL RELATIONSHIP OF THE STUDY PARTICIPANTS IN HAWASSA CITY, 2012.

No.	Marital Status	No fertility desire		Desired fertility		Chi-square	df	P-value
		Frequency	%	Frequency	%			
1	Married	175	55.7	139	44.3	28.23	4	0.0000
2	Never married	10	32.3	21	67.7			
3	Single	43	81.1	10	18.9			
4	Widowed	2	16.7	10	83.3			
5	Divorced	28	56	22	44			

4.7.7.6 Fertility Desire and Highest Educational Level Attended by the Study Participants (N=460)

A higher proportions of illiterate participants, 37(71.2%), reported not to desire for childbearing as compared to the 34 (53.1%) of participants with college or university level of education. Respondents who could not read and write are 64% less likely to show childbearing desire compared to those who attended college or University (Odds Ratio (OR): 0.46, 95% CI 0.2116-0.9975, p-value=0.049).

So, it is high likely that those with an educational level of high school and above are more likely to desire for a child as compared to those who reported to attend below high school. Illiterate mother had already enough children; about 26 (50%) of them had four and more children, as compared to only 15 (24.6%) of college level educated participants who had at least four children.

However, it was found that residential area is the effect modifier of the relation of educational level and fertility desire (Crude Odds ratio(COR):1.55, p-value=0.02; Adjusted Odds Ratio (AOR) for rural: 1.95, p-value=0.29; Adjusted Odds Ratio (AOR) for urban:1.34, p-value=0.15

and the test for effect modification p -value=0.57 which is greater than 0.05. Moreover, the relation between educational level and fertility desire is confounded by partner fertility desire (Crude Odds Ratio(COR):1.55, Adjusted Odds Ratio (AOR) for failure of fertility desire by partners: 0.94, p -value=0.87 and Adjusted Odds Ratio (AOR) for desired fertility by partners: 1.02, p -value=0.96).

4.7.7.7 Fertility Desire and Occupation by the Study Participants (N=460)

Fifty-six (70.9%) of female participants who reported that they were housewife said they would not like to have a birth in the future. This was followed by unemployed (59%), employed (53.4%), daily laborer (52.5%) and merchants (48.4%). Relatively the higher proportion of merchants 48 (51.6%) reported they desire to have a child whereas housewife were the least proportion to report for childbearing desire(29.1%).

TABLE 4.12: RELATIONSHIP OF FERTILITY DESIRE AND OCCUPATION OF THE STUDY PARTICIPANTS, HAWASSA 2012 (N=460)

No.	Occupation	No fertility desire		Desired fertility		Chi-square	df	P-value
		Frequency	%	Frequency	%			
1	Employed	78	53.4	68	46.6	10.25	4	0.0364
2	Unemployed	46	59	32	41			
3	Housewife	56	70.9	23	29.1			
4	Merchant	45	48.4	48	51.6			
5	Daily labourer	31	52.5	28	47.5			
	Total	256	56.3	199	43.7			

The bivariate analysis showed that reported housewife were noted to be less likely to desire for a child as compared to dialy laborers (Odds ratio (OR): 0.4547 95% C.I. 0.2247 p -value=0.0284). This relation is confounded by family size, total birth owned and partner fertiltiy desire, however.

4.7.7.8 Fertility Desire and Area of Resident by the Study Participants (N=460)

As can be seen in the firgure below, 78.3% of the rural participants responded they would not like to have a child in the future as compared to 52.2 % of the urbans. However, only 21.7 %

of the rural responded 'yes' to fertility desire whereas 47.0 % of the urban reported to desire for a child in the future.

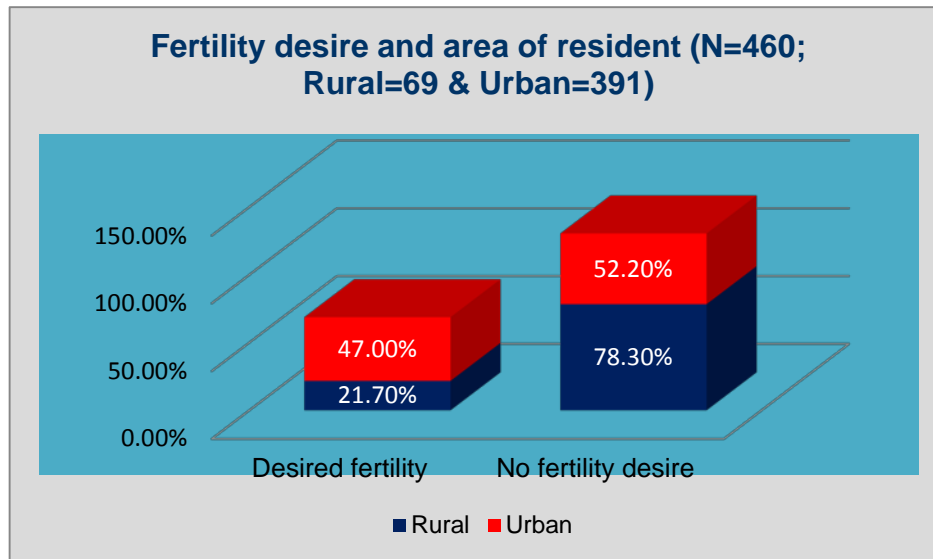


Figure 4.11: A bar graph with fertility desire diaggreted by area of resident, Hawassa 2012.

The bivariate analysis showed that urban participants reported to desire a/nother birth 3.3 times more likely as compared to the rurals (Odds Ratio(OR): 3.3, 95%CI 1.8-6.05, p-value=0.0001). However, the relationship between area of resident and fertiltiy desire is confonded by partners' fertilty desire (Crude Odds Ratio (COR):3.30, p-value=0.0001;Adjusted Odds Ratio (AOR): 2.38, for no partner fertility desire OR=2.04, p-value=0.25; for desired fertility by partners OR=2.67, p-value=0.07).

4.7.7.9 Fertility Desire and Monthly Income of the Study Participants (N=460)

Though the data for the average montlhy income was difficult to estimate and collect, most of the respondents who responded to desire for a child (45.5%) were those who said that they either have no or unknow income. The higher portion of same participants (49%) were also reported to not to have a birth in the future. Otherwise, there was no associatation noted between average monthly income and fertilty desire (Chi-sqaure=0.76, p-value=0.86)

4.7.7.10 Fertility Desire and Family Size in Household of the Study Participants (N=460)

Ninty-seven (60.6%) of participants with 1-3 family size had reported future childbearing as compared to 92 (39%) and 13(20.3%) of those who had 4-7 and more than 7 household family size respectively. As also seen in the table below there was a decreasing proportions of

participants failed to show a desire of future birth as their reported family size was decreasing; 79.7% for more than 7, 61% for 4-7 and 39.4% for 1-3 family size.

TABLE 4.13: FREQUENCY OF FERTILITY DESIRE BASED ON THE HOUSEHOLD FAMILY SIZE OF THE STUDY PARTICIPANTS IN HAWASSA, 2012 (N=460)

Household family size	No fertility desire		Desired fertility		Chi-square	df	P-value
	Frequency	%	Frequency	%			
one to three	63	39.4	97	60.6	34.95	2	0.00
Four to seven	144	61	92	39			
More than seven	51	79.7	13	20.3			
Total	258	56.1	202	43.9			

In the bivariate analysis participants with a higher family size were less likely to report to have a birth in the future. Thus, the respective participants with more than 7 and with 4-6 family size are 83.44% and 58.52% less likely to desire for a child in the future as compared to respondents with 1-3 family size.

In summary, bivariate analysis showed that fertility desire has an association with the socio-demographic characteristics of the participants such as age, religion, marital status, educational level, occupation, area of resident and house hold family size. However, association was not noted with gender, ethnic group and average monthly income of the respondents. Single or never married partners who were young daily laborer residing in urban and non-Catholics having fewer than three household family size and attended at least high school are noted to desire for a child in the future.

4.7.8 Fertility Desire and Participants HIV and ART history

4.7.8.1 Fertility Desire and Duration after HIV Diagnosis (N=460)

On average about 55.6% of respondents in each category of duration after HIV diagnosis reported that they had not had a desire to have a child as compared to the average proportion of 44.5% of those who reported they did want to have a child. There is no significant difference

regarding fertility desire based on the duration after HIV diagnosis (Odds Ratio (OR): 0.999, 95% CI 0.993-1.005, p-value=0.7441). See table below

TABLE 4.14: FREQUENCY OF FERTILITY DESIRE AND DURATION AFTER HIV DIAGNOSIS, HAWASSA 2012 (N=460)

No	Duration after HIV diagnosis	No fertility desire		Desired fertility		Chi-square	df	P-value
		Frequency	%	Frequency	%			
1	1-24 months	83	55.3	67	44.7	1.585	3	0.662
2	25-38 months	41	51.3	39	48.8			
3	39-60 months	82	59.9	55	40.1			
4	>=61 months	52	55.9	41	44.1			
5	Total	258	56.1	202	43.9			

It was also found that equal number and proportion of participants, 24 (50%), who had known their HIV status less than 12 months responded to desire and not to desire for fertility. On the other hand, 234 (56.8%) and 178(43.2%) of those who had known their HIV sero-status 12 months or more were responded not to desire and to desire for future childbearing respectively. Yet, there is no statistically significant difference between fertility desire and duration of HIV diagnosis when categorized as less than 12 months and 12 months and above (Odds Ratio (OR): 0.76, 95% CI 0.42-1.38, p-value=0.37).

4.7.8.2 Fertility Desire and Status of ART Initiation (N=460)

Two hundred and ten (56.9%) of respondents who were on ART reported not to desire for a birth in the future during the data collection. The figure is 159 (52.7%) for those who were not be put on ART. See figure below.

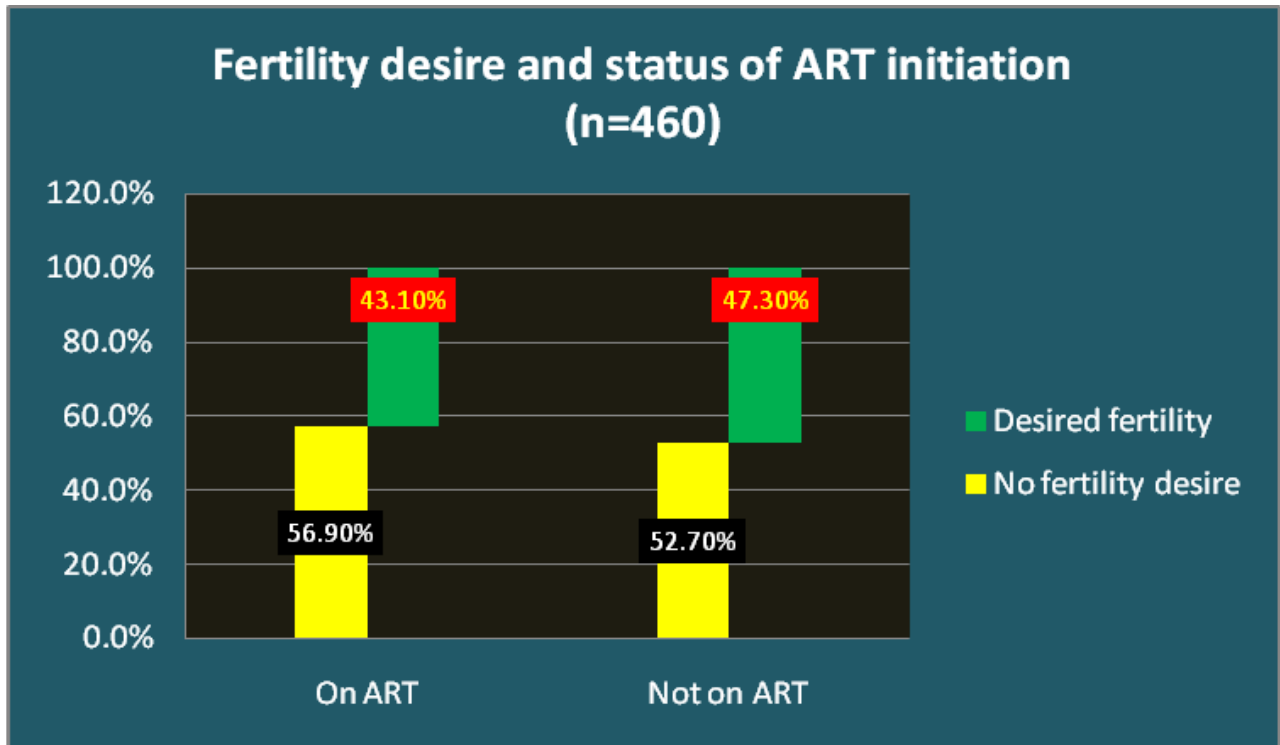


Figure 4.12: Bar chart showing fertility desire based on the status of ART initiation

Fertility desire is not significantly different based on participants status of ART initiation. The 43.1% fertility desire reported in patients on ART is not significantly different as compared to the 47.3% of desired fertility reported by those clients not started on ART (Odds Ratio (OR) 0.85 95% CI 0.53-1.34, p-value=0.47).

4.7.8.3 Fertility Desire and Duration after ART Initiation(N=366)

An average of 52 (56.92%) of respondents in each category of duration after ART initiation responded that they would not like to have a pregnancy in the future. Similarly, about 39 (43.5%) of respondents in each duration after ART initiation category on average responded that they would like to have a child in the future. As can be seen in the table below there is no significant statistical association between duration after ART initiation and desire for fertility.

TABLE 4.15: FERTILITY DESIRE BASED ON DURATION AFTER ART INITIATION, HAWASA 2012 (N=366)

Duration after ART initiation (months)	No fertility desire		Desired fertility		Chi-square	df	p-value
	Frequency	%	Frequency	%			
1-20	62	59	43	42	2.63	3	0.451
21-33	41	49.4	42	51			
34-48	59	59	41	41			
>=49	47	60.3	31	40			
Tota							
I	209	57.1	157	43			

4.7.8.4. Fertility Desire and Health Status after ART Initiation (N=368)

As can be seen in table below, the higher proportions of respondents who reported to be well after ART initiation said not to desire for childbearing, 197(56.9%). About 149 (43.1%) of them, however, would like to have a birth in the future. Though the absolute number is smaller, 8(72.7%) of those with aggravated health status after ART initiation were not like to have a child in the future. Five (45.5%) and 6 (54.5%) of participants who reported to be with out a change in thier health statu after ART reported not desiring and desiring for future fertility respectively. Yet there is no sighnificant asscotion noted between health status after ART and the desire for fertility .

TABLE 4.16: FREQUENCY OF FERTILITY DESIRE BASED ON THE HEALTH STATUS OF STUDY PARTICIPANTS, HAWASSA 2012

No	Health status after ART	No fertility desire		Desired fertility		Fisher Exact test	df	p- value
		Frequency	%	frequency	%			
1	Improved	197	56.9	149	43.1	1.71	2	0.43
2	Aggravated	8	72.7	3	27.3			
3	No change	5	45.5	6	54.5			
4	Total	210	57.1	158	42.9			

4.7.9 Desire for Childbearing and Participants' Fertility History

4.7.9.1 Fertiltiy Desire and Reported Total Births

A wish to have a birth in the future was reported in 31(86.1%) of those with no births during the data collection period. A desire to have a child in the future was also reported in the respective 44(40%), 28(35%), and 28(21.5%) of participants who responded to have 2, 3 and more than 3 children during the study period. Thus, it can be noted from table below that there is an increasing pattern of proportion of those participants who wouldn't like to have a child in the future as their total number of children reported during the data collection period were increased from no child to more than three children. In other words, the lesser birth experienced by the study participants the high likely that they reported the desire to have a child in the future.

TABLE 4.17: FREQUENCY OF FERTILITY DESIRE AND OVERALL BIRTHS REPORTED BY THE RESPONDENTS, HAWASSA 2012 (N=344).

No	Total births	No fertility desire		Desired fertility		Fischer Exact test	df	p- value
		Frequency	%	frequency	%			
1	None	5	13.9	31	86.1	73.22	4	0.0000
2	One	30	34.1	58	65.9			
3	Two	66	60	44	40			
3	three	52	65	28	35			
4	more than three	102	78.5	28	21.5			
5	Total	255	57.4	189	42.6			

There is strong relationship between reported total number of birth experienced by the study participants and their desire for future childbearing. As compared to participants with more than three births, respondents with no birth, one birth, two births and three births were about 23, 7, 2.4 and 2 times more likley to desire for future childbearing. See table below.

TABLE 4.18: RELATING FERTILITY DESIRE AND TOTAL REPORTED BIRTHS OWNED, HAWASSA 2012.

Term	Odds Ratio	95%	C.I.	S. E.	Z-Statistic	P-Value
Total births (No births/more than three)	<u>22.5857</u>	<u>8.0404</u>	<u>63.4443</u>	0.527	5.9155	<u>0.0000</u>
Total births (one/more than three)	<u>7.0429</u>	<u>3.8361</u>	<u>12.9304</u>	0.31	6.2971	<u>0.0000</u>
Total births(Two/more than three)	<u>2.4286</u>	<u>1.3789</u>	<u>4.2773</u>	0.2888	3.0725	<u>0.0021</u>
Total births (three/more than three)	<u>1.9615</u>	<u>1.0539</u>	<u>3.6508</u>	0.317	2.1256	<u>0.0335</u>
CONSTANT	*	*	*	0.2133	-6.0594	<u>0.0000</u>

4.7.9.2 Fertility Desire and Reported Number of Births after HIV Diagnosis (N=444)

As seen in figure below, proportion of participants responded for desiring not to have a /nother child/ren is decreasing as the number of reported births after HIV diagnosis is decreasing from 2 and more births to no birth. Sixteen (72.7%) of participants with more than one births, 69 (63.3%) respondents with one child and 170 (54.3%) of them with no births responded that they would not desire to have a child.

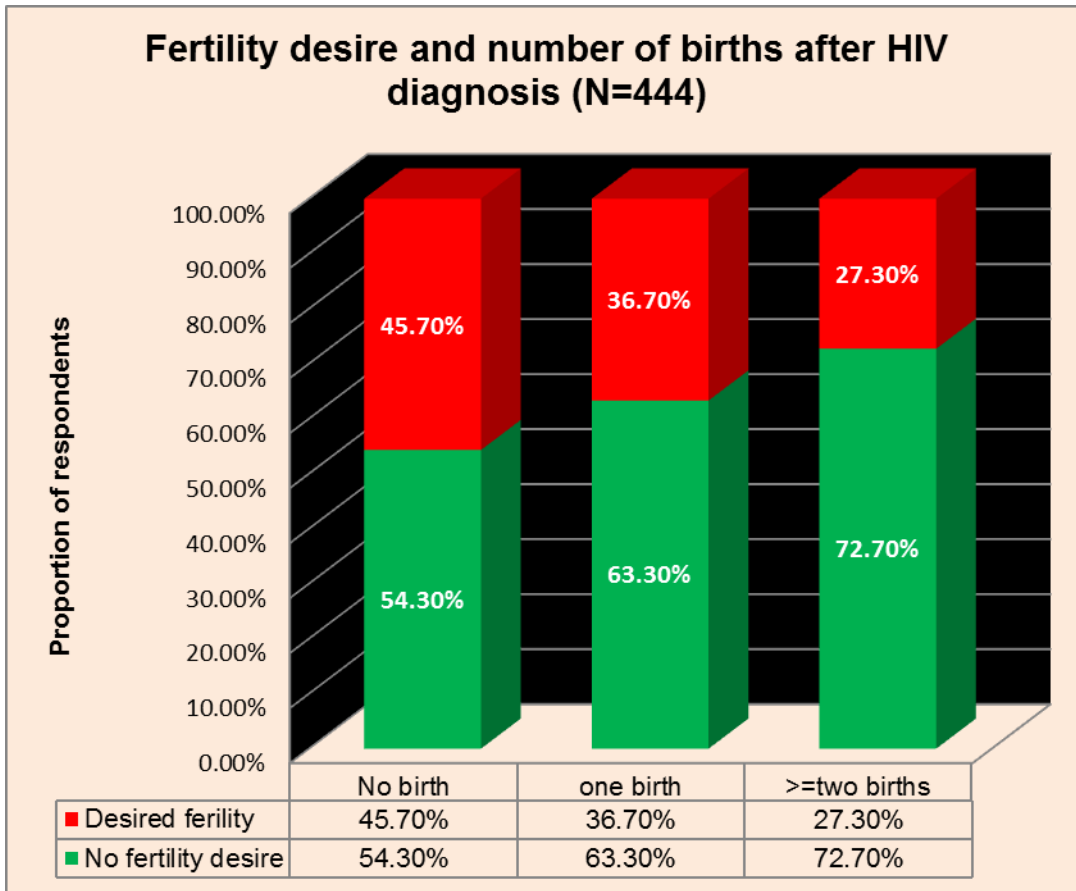


Figure 4.13: A bar graph showing the desire for childbearing disaggregated by number of births after HIV diagnosis.

There is also an increasing proportion of participants responding to have a birth as the overall reported child is becoming smaller. For example, 6 (27.3%) of respondents with more than one children, 40 (36.7%) with only one birth and 143 (45.7%) with no child reported to desire a future pregnancy. So there is a negative association between experience of birth after HIV diagnosis and desire to have a child in the future: participants who had a prior birth experience reported to desire childbearing less likely as compared to those with no previous birth experience (Odds Ratio (OR) 0.64 95% CI 0.42-0.98, p-value=0.04).

4.7.9.3 Fertility Desire and Reported Number of Births after ART Initiation (N=419)

It is shown in figure below that 6 (75%) of respondents with more than one child after ART initiation responded not to have a future pregnancy as compared to 2 (25%) of those with 2 or more child after ART initiation who responded that they would like to have a child. Similarly, 37 (59.7%) of respondents with one child did not like to have a child as compared to 25 (40.3%) of

those with one child but desired to have a child. Also 202 (57.9%) of those participants with no child after ART reported they wanted to have a child as compared to 149 (42.1%) those with no birth experience after ART but desire to have pregnancy in the future.

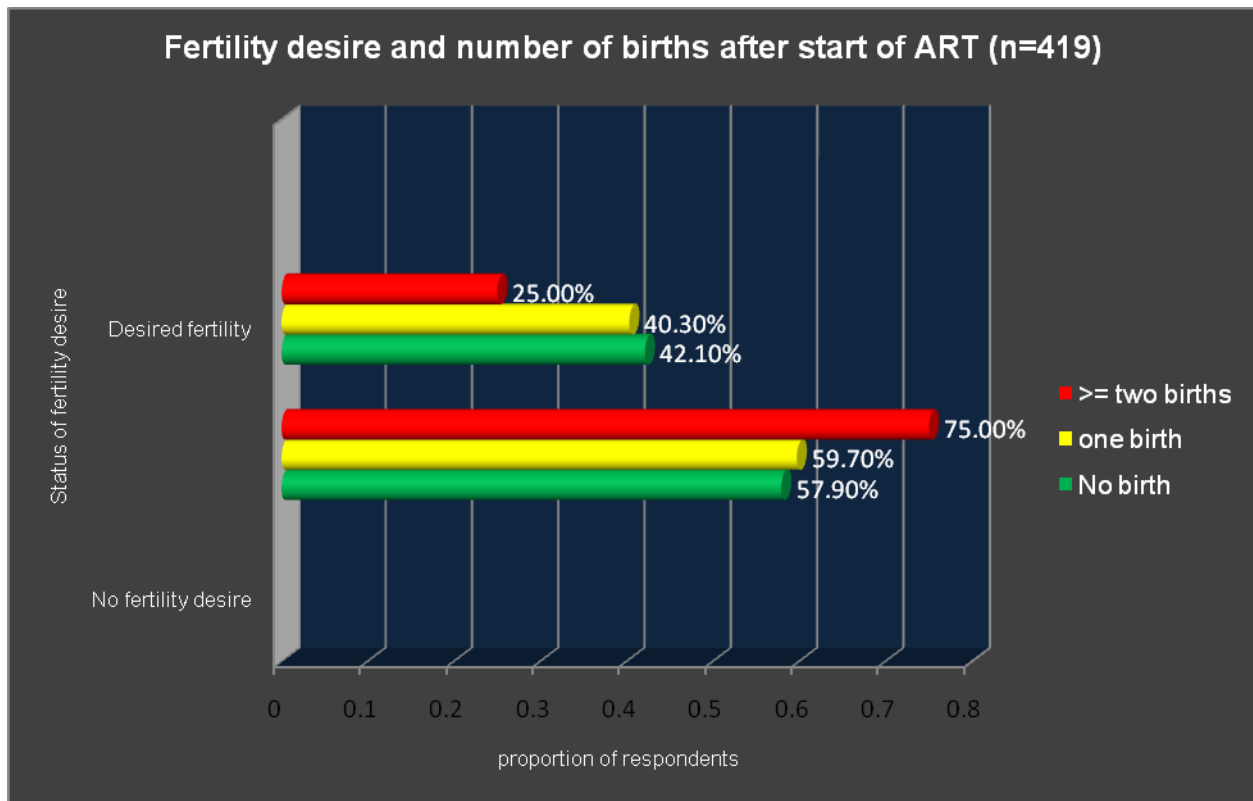


Figure 4.14: A Bar graph showing fertility desire based on number of births after initiation of ART

It seems that as the number of reported births after ART initiation is decreasing the desire to have a birth is getting higher. Yet, there is no statistically significant association between number of births after ART and a desire to have a child at significance level of 5% (p -value=0.58).

Therefore, participants with a higher total births and more births after HIV diagnosis are negatively associated with fertility desire. Respondents who reported a need to have a child were those with a lesser number of births especially after HIV diagnosis. Nevertheless, the association is not noted between fertility desire and experience of birth after ART initiation.

4.7.10 Fertility Desire and Participants' Partner Characteristics

4.7.10.1 Fertility Desire and Duration in Relationship with Partner (N=334)

The proportion of respondents who wanted to have a child was decreasing from 62 (59.6%) to 19 (25.3%) as the duration in the relationship is increasing from 1-6 years to 16 years or more.

As the duration in relationship is decreasing from 16 years or more to 1-6 years the proportion of respondent not desiring a future pregnancy was increasing from 56 (74.7%) to 42 (40.4%). See table below.

TABLE 4.19: FREQUENCY DISTRIBUTION OF FERTILITY DESIRE BASED ON DURATON IN RELATIONSHIP OF THE STUDY PARTICIPANTS, HAWASSA 2012

No.	Duration in relationship	No fertility desire		Desired fertility		Chi-square	df	P-value
		Frequency	%	frequency	%			
1	1-6 years	42	40.4	62	59.6	21.18	3	0.0001
2	7-10 years	52	54.2	44	45.8			
3	11-15 years	35	59.3	24	40.7			
4	>=16years	56	74.7	19	25.3			
5	Total	185	55.4	149	44.6			

It can also be computed that 106 (53%) of participants reported in relationship for 1-10 years responded they would like to have a birth as compared to only 43 (32.1%) of those participants who were in relationship for 11 years or more, and this is statistically significant (Odds Ratio (OR):2.40, 95%CI 1.5-3.77, p-value=0.0001). That is participant who were in relationship for longer period of time were less likely to desire for a child as compared to those who had relatively been in relationship for shorter period of time (Odds Ratio (OR): 0.91, 95%CI 0.87-0.94, p-value=0.0000). This relationship is confounded by partner fertility desire (Crude Odds Ratio (COR): 2.4, p-value=0.0004 and Adjusted Odds Ratio (AOR): 1.22, P-value=0.50), however.

4.7.12.2 Fertility Desire and Disclosure of HIV Status to the Partner (N=331)

As seen in the figure below 178 (55.8%) participants who did tell to their partner that they are HIV positive would not like to have a child in the future as compared to 141 (44.2%) of participants who disclosed their HIV status but desired to have a birth. The majority of those who had not disclosed their HIV status, 9 (75%), reported to show the desire to have a future pregnancy as compared to 3 (25%) that did not disclose their HIV status but wanted to have a child.

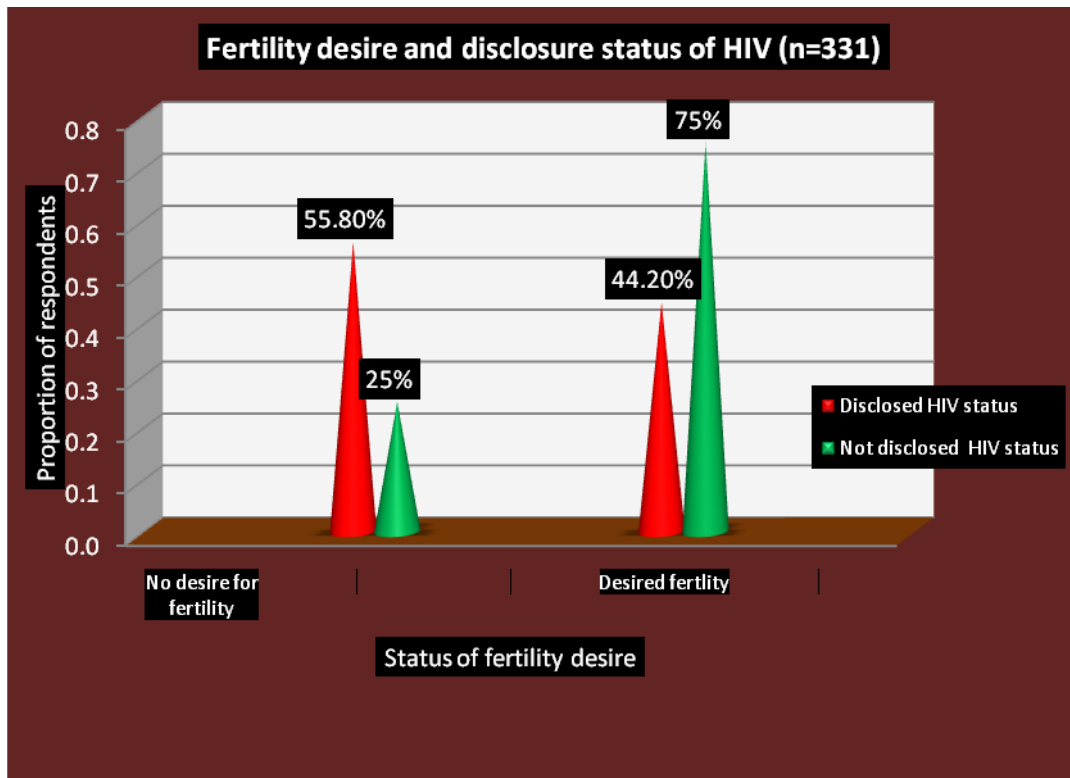


Figure 4.15: Childbearing desire based on the status of disclosing HIV sero-status to partner

Though weak at 5% significance level, there is an association between fertility desire and disclosing ones' HIV status to partner. Those who did disclose their HIV status to their partner were 73.6% less likely to desire for a birth in the future as compared to those who fail to do so (Odds Ratio (OR) 0.264 95% CI 0.07-0.99, p-value=0.488). It was also computed that the relationship between disclosure status of study participants and fertility desire is confounded by the household family size (Crude Odds Ratio (COR): 0.2640, p-value=0.0488; Adjusted Odds Ratio (AOR):0.4958, p-value=0.3262).

4.7.10.3 Fertility Desire and Knowledge of Partner's HIV status (N=328)

As noted in the table below 12 (57.1%) of respondents who did not know their partners HIV serostatus said that they wanted to have a child in the future as compared to 9 (42.9%) of them who responded not to desire for a birth. On the contrary, 129 (54.4%) of respondents who reported that their partner were HIV positive responded they did not want to have a fertility in the future. This figure is 43 (61.4%) for those whose partners were HIV negative.

TABLE 4.20: THE FREQUENCY OF PARTNER FERTILITY DESIRE DISAGGREGATED BY PARTNER HIV STATUS, HAWASSA 2012 (N=328)

No.	Partner HIV status	No desire for fertility		Desired fertility		Fisher exact test	Df	p-value
		Frequency	%	Frequency	%			
1	HIV positive	129	54.4	108	45.6	2.45	2	0.294
2	HIV negative	43	61.4	27	38.6			
3	Unknown	9	42.9	12	57.1			
	Total	181	55.2	147	44.8			

More over, there were 172 (56%) of participants who knew their partners' HIV status but did not want to have a child in the future as compared to 135 (44%) of those who did know their partners HIV status and desire to have a birth. Nine (42.9%) and 12 (57.1%) of participants who did know their partners HIV status reported not to desire and want to have a child in the future respectively. Yet there is no statistically significant association between fertility desire and knowledge of partner's sero status (OR=0.5887 95%CI 0.24-1.44 p-value=0.24). Categorizing the partner HIV status into HIV positive and HIVnegative/unknown was also computed to be without association with fertility desire (OR=1.116 95%CI 0.6855-1.92 p-value=0.6583).

4.7.10.4 Fertility Desire of Study Participants and of Their Partners (N=328)

It shown that a higher proportion of participants, 130 (88.4%), who responded not to desire for future births reported that their partner did not want to have a child as well. Similarly, a significant proportion of respondents, 112 (82.4%), with a fertility desire reported that their partner did also want to have a child.

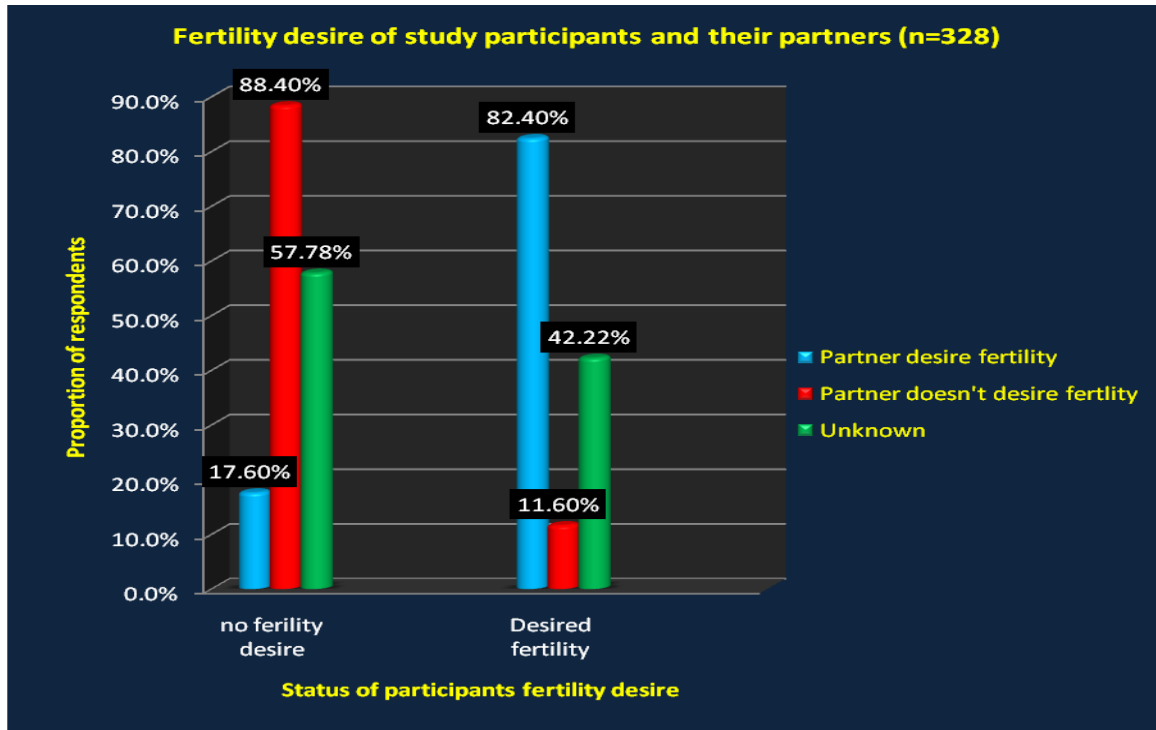


Figure 4.16: A bar graph indicating fertility desire of the study participants and their partners

There is strong association between fertility desire of the participants and their partner. Participants whose partner wanted to have a child and unknown desire of fertility are about 36 and 6 times more likely to have a child as compared to those participants whose partners did not want to have a child in the future. See table 4.44 below.

It can also be computed that 17 (39.5%) HIV positive female with negative partner (discordant couples) reported that their partner also wanted a child. This is 15 (31.9%) for HIV positive males but there is no statistically significant difference.

TABLE 4.21: A BIVARIATE ANALYSIS INDICATING THE RELATIOSHIP BETWEEN FERTILITY DESIRE OF THE PARTICIPANTS AND THEIR PARTNERS, HAWASSA 2012 (N=328)

Term	Odds Ratio	95% C.I.	Co-efficient	S. E.	Z-Statistic	P-Value	
Partner fertility desire							
Unknown/no	<u>5.5882</u>	<u>2.5665</u>	<u>12.1675</u>	1.7207	0.397	4.3342	<u>0.0000</u>
yes/no	<u>35.6863</u>	<u>18.2477</u>	<u>69.7903</u>	3.5748	0.3422	10.446	<u>0.0000</u>
CONSTANT	*	*	*	-2.0343	0.2579	-7.8878	<u>0.0000</u>

In short, there is strong association between fertility desire and duration in relationship and their partners fertility desire. On the other hand, there is a weak and negative association between fertility desire and disclosure of HIV status. That is participants who had been together for shorter period of time having a partner with fertility desire to whom they did not disclose their own HIV status were more likely to desire for future chilbearing.

4.7.11 Fertility Desire and History of Family Planning

4.7.11.1 Fertility Desire and Ue of Contraceptive

About 107(50.5%) of study participants who reported not to use contraceptive were found to have a desire for childbearing whereas a few (39.1%, 97) of them using contraceptive had no willing for fertility desire. That is, 49.50% of the respondents who were not using a family palnning aslo want to have a child in the future. See figure below.

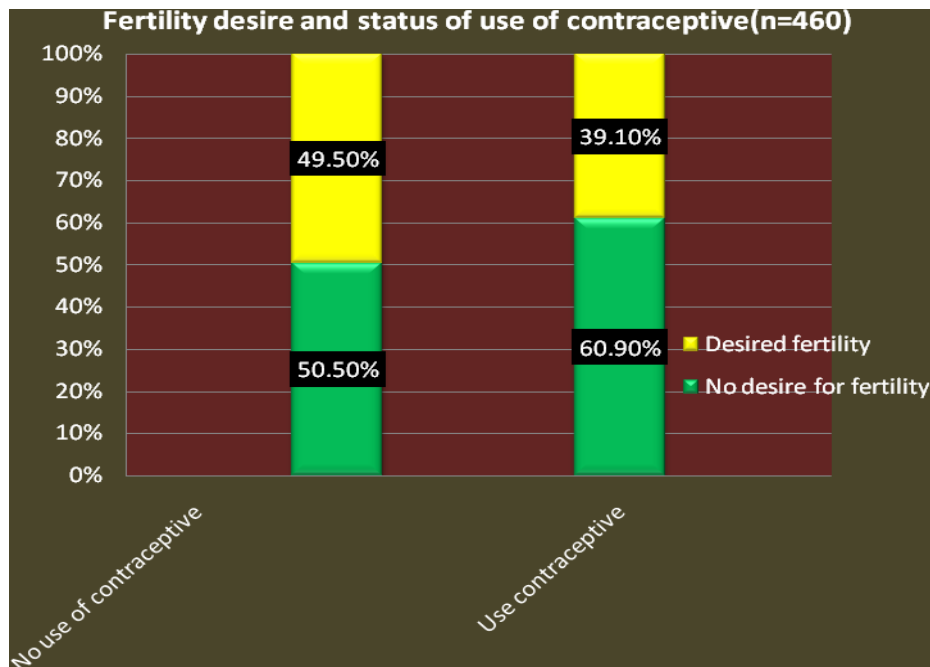


Figure 4.17 A bar graph showing use of contraceptive and fertility desire.

Unmet need of family planning in this study was computed to be 32.4%; 11 out of 34 married women participants who were not using any form of contraception did not have a desire to have a child in the future. However, 74.2% (98) of married female participants were using at least one of the contraception in this study.

The bivariate analysis showed that there is a negative association between fertility desire and the use of modern family planning. Participants who were using contraceptive were less likely to desire for future birth (Odds Ratio (OR): 0.6546 95% CI 0.4518-0.9485, p-value=0.0251). In the other words, respondents who did not use a birth control were 1.5 times more likely to desire for a future birth (Odds Ratio (OR): 1.5276, 95%CI 1.0543-2.2134, p-value=0.025).

4.7.11.2 Fertility Desire and Use of Contraceptive by the Partners of Study Participants(N=319).

Relatively, lower proportion of participants whose partner reported to use contraceptive 94 (43.5%) would like to have a child as compared to those whose partner were not using any family planning or unknown whether using or not 54(47.8%). In fact, there was no statistically significant association between the use of contraceptive by the partners of the participants and fertility desire (Odds Ratio (OR): 0.84 95% CI 0.53-1.33, p-value=0.46).

4.7.11.3 Fertility Desire and Use of Condom by Study Participants (N=270)

The higher proportion of participants (70%, 42) who were not using condom would not like to have a children in the future whereas the lower proportion (30%, 18) who were not using contraceptive reported childbearing in the future. Yet there is no association between use of condom and fertility desire at significant level of 5%.

TABLE 4.22: FERQUENCY OF FERTILITY DESIRE BASED ON THE USE OF CONDOM , HAWASSA 2012

No	Use of condom	No fertility desire		Desired fertility		Chi-square	Df	p-value
		Frequency	%	Frequency	%			
1	Yes	126	60	84	40	1.9853	2	0.16
2	No	42	70	18	30			
3	Total	168	62.2	102	37.8			

Bivariate analysis thus has shown that here is a negative association between fertility desire and use of contraceptive use. However, no association noted between fertility desire and partner use of family planning and use of condom at 0.05 significant level.

4.7.11.4 Summary of Fertility Desire and Associated Factors from Bivariate Analysis

With the exception of partner fertility desire (having positive association with fertility desire); age , highest educational level,use of contraceptive, family size in the household, total births owned, births experience after HIV diagnosis, duration in relationship, disclosure of HIV status to partner are associated negatively with the desire to have a child in the future. Marital status, religion, residential area, occupation are also found to have an association with fertility desire in bivarible analysis at significant level of 0.05. Statistically significant association with the variables; gender, ethnic group, monthly income, duration after HIV diagnosis and ART initiation, health status after HAART initiation, birth experience after ART, and knowledge of partner HIV status is not appreciated during the bivariate analysis at significant level of 0.05.

Therefore, a non-Catholic younger participants from urban area who were never married single or non-married but having a partner and whose partner also desired to have a child in the

future showed a desire of childbearing in the future. Moreover, participants who had attended at least high school education and failed to disclose their own HIV status to partner were also found to desire for a/nother child/ren. On the contrary, future childbearing is less likely reported by respondents who were from a higher household family size of more than four, having not less than three children, with an experience of a birth after HIV diagnosis, and using one of the modern contraceptives.

4.8 RESEARCH RESULTS: MULTIVARIABLE LOGISTIC REGRESSION ANALYSIS OF FERTILITY DESIRE

4.8.1 Fit model with variables identified to be related to fertility desire at p-value<0.25

It is necessary to have a separate model for family size, total births owned, and births after HIV diagnosis. This is due to the fact that one is the subset of the other; all births are under family size and births after HIV are also included in the overall number of births. If included in a model, they unnecessarily affect the odds ratio and coefficient of one another. Same works for use of contraceptive and use of condom as well as duration after HIV diagnosis and duration on ART. Thus, one variable at a time is included in a model if these variables are to be included in the model.

Thus, 6 models were built when modelling for variables having an association with fertility desire during bi-variable analysis; three each for family size, total births and births after HIV diagnosis under use of contraceptive and condom use.

In the six models partners' fertility desire is persistently associated with fertility desire of the study participants. In each model where family size, total births and births after HIV diagnosis were included all of these variables remained to be significantly associated with the reported fertility desire at significant level of 0.05. Use of family planning and residential area are also consistently significant at p<0.25 level in all models containing these variables. Use of condom was significant at p<0.25 in two of the models out of the three models where condom use was included. In addition, in the two out of the three models containing age and marital status these variables were found to be associated with fertility desire at p<0.25.

Per the purposive variable selection method the next step of multivariate logistic analysis is to include variables which were initially found to be not associated with fertility desire during bivariate analysis and excluded in the above fit model. These are gender, ethnic group,

average monthly income, duration after HIV diagnosis and ART initiation, ART initiation status, health status after ART, birth after ART and partner use of family planning . Partner fertility desire, total births and family size are also identified to be a confounding variables in need to be included in a model in this study. Moreover, variables which are potentially confounders from the previous literature are age, gender, educational status and residential areas. Of course, residential area and age have already been identified as variables having an association with fertility desire (at $p < 0.25$) which should be involved in every model.

Hence, age, gender, educational level, residential area, partner fertility desire have to be included in all models as confounders and variables having association with fertility desire. But there will be separate models based on family size, total births, births after HIV diagnosis and ART initiation, use of contraceptive and condom use. Gender, ethnic group, average monthly income, duration after HIV diagnosis and ART initiation, ART initiation status, health status after ART, birth after ART and partner use of family planning are included in the models one at a time making a total of 26 models.

After this serial modelling the following variables were still associated with fertility desire; partner fertility desire, family size, total births, births after HIV diagnosis and use of contraceptive at 5% significant level. This is a model with preliminary main effect model.

The next procedure is identification of interaction terms and adding them to the preliminary main effect model.

It has already been identified that total births is an effect modifier for the relation between use of contraception and fertility desire; residential area modifies the association between educational level and fertility desire; residential area modifies the association between partner fertility desire and fertility desire. The following table shows the summary of identified interaction terms. Interaction with educational level was dropped. The evaluation with likelihood is significant ($P = 0.000$) for all interaction model.

TABLE 4.23: THE INTERACTION TERMS IDENTIFICATION

Term	Odds Ratio	95% C.I.	Co-efficient	S. E.	Z-Statistic	P-Value	
Educational level							
High school and above/Below High school	1.9545	0.5537	6.8999	0.6702	0.6436	1.0413	0.2977
Resident							
Urban/Rural	<u>3.4325</u>	<u>1.6357</u>	<u>7.2029</u>	1.2333	0.3782	3.2612	<u>0.0011</u>
Educational Level * Resident	0.6837	0.1821	2.5662	-0.3803	0.6749	-0.5635	0.5731
CONSTANT	*	*	*	-1.4586	0.3511	-4.1547	<u>0.0000</u>
Partner fertility desire							
Yes/No	<u>24.375</u>	<u>5.1721</u>	<u>114.874</u>	3.1936	0.791	4.0375	<u>0.0001</u>
Resident							
Urban/Rural	2.6667	0.887	8.0174	0.9808	0.5616	1.7464	0.0807
Partner fertility desire * Resident	0.765	0.1441	4.0602	-0.2679	0.8516	-0.3146	0.7531
CONSTANT	*	*	*	-2.2773	0.525	-4.3376	<u>0.0000</u>
Use of Contraceptive							
yes/No	0.7776	0.42	1.4398	-0.2516	0.3143	-0.8003	0.4235
Total births							
0-2 births/>2 births	<u>3.8608</u>	<u>2.123</u>	<u>7.0211</u>	1.3509	0.3051	4.4272	<u>0.0000</u>
Use of Contraceptive * total births	0.8751	0.3904	1.9617	-0.1334	0.4119	-0.324	0.746
CONSTANT	*	*	*	-0.869	0.2336	-3.7195	<u>0.0002</u>

There fore, total births, use of contraceptive, residential area and partner fertilty desire are involved in the next model in addition to the “use of contraceptive * total births” and “ resident * partner fertilty desire” as interaction terms. In the last model, the preliminary main effect model, variables identified are partner fertilty desire, family size, total births, births after HIV diagnosis and use of contraceptive to be dealt with the intraction terms. Thus, residential area, family size, total births, births after HIV diagnosis, partner fertilty desire, use of contraception and the interaction terms (“use of contraceptive * total births” and resident * partner fertilty desire) will be included in the last model. Yet, three models will be created each for family size, total births and births after HIV diagnosis.

TABLE 4.24: PRILIMINARY FINAL MODEL OF FERTILITY DESIRE WITH FAMILY SIZE(FMODEL1)

Term	Odds Ratio	95% C.I.	Coefficient	S. E.	Z-Statistic	P-Value
Use of contraceptive						
Yes/No	0.5418	0.2888 1.0164	-0.6129	0.321	-1.9094	0.0562
Partner fertility desire						
Yes/No	<u>17.8955</u>	<u>3.6838</u> <u>86.9348</u>	2.8846	0.8064	3.5769	<u>0.0003</u>
Resident						
Urban/Rural	2.3278	0.7635 7.0976	0.8449	0.5688	1.4855	0.1374
Family size						
more than 3/1-3	<u>0.4344</u>	<u>0.2194</u> <u>0.8602</u>	-0.8337	0.3485	-2.3922	<u>0.0167</u>
Partner fertility desire						
* Resident	0.9097	0.166 4.9844	-0.0946	0.8679	-0.1091	0.9132
CONSTANT	*	*	-1.0301	0.655	-1.5727	0.1158
Convergence:	Converged					
Iterations:	6					
Final -2*Log-Likelihood:	297.2331					
Cases included:	328					
Test	Statistic	D.F.	P-Value			
Score	138.7966	5	0.0000			
Likelihood Ratio	154.3446	5	0.0000			

As can be seen in the last model with family size partner fertility desire, household family size were significantly associated with a desire for childbearing at significant level of 5%. Use of contraceptive is significantly associated with desire for fertility desire at $p < 0.1$. The test for goodness of fits of the model is well demonstrated by likelihood test ratio which is significant (p -value= 0.0000).

TABLE 4.25: PRILIMINARY FINAL MODEL OF FERTILTIIY DESIRE WITH BIRTH AFTER HIV DIAGNOSIS (FMODELII)

Term	Odds Ratio	95% C.I.	Co-efficient	S. E.	Z-Statistic	P-Value
Use of contraceptive						
Yes/No	0.5598	0.2995 1.0464	-0.5801	0.3191	-1.8177	0.0691
Partner fertility desire						
Yes/No	<u>23.8901</u>	<u>4.9384</u> <u>115.5715</u>	3.1735	0.8043	3.9456	<u>0.0001</u>
Resident						
Urban/Rural	2.5874	0.8495 7.881	0.9507	0.5683	1.6729	0.0944
Birth after HIV diagnosis						
Yes/No	<u>0.4817</u>	<u>0.2564</u> <u>0.9047</u>	-0.7305	0.3216	-2.2712	<u>0.0231</u>
Partner fertility desire *						
Resident	0.8255	0.1518 4.4888	-0.1917	0.864	-0.2219	0.8244
CONSTANT	*	* *	-1.6332	0.5771	-2.8301	<u>0.0047</u>
Convergence:	Converged					
Iterations:	6					
Final -2*Log-Likelihood:	294.2816					
Cases included:	327					
Test	Statistic	D.F.	P-Value			
Score	139.9436	5	0.0000			
Likelihood Ratio	155.7007	5	0.0000			

The priliminary final model II involving births after HIV diagnosis aslo shows that partner fertiltiy desire and biths experience after HIV diagnosis is strongly asociated with a desire for future childbearing at 5% significant level. When p-value set at 0.1 significant level residential area and use of family planning have aslo related with the desire for fertiltiy desire. As also clearly noted, the test for goodness of fits is well shown by the p-value of 0.0000 of liklihood test.

Eventaully, model III with overall births indicates that total births and parner fertiltiy desire are strongly associated with fertility desire at significant level of 5 %. See table 4.61.

TABLE 4.26: PRILIMINARY FINAL MODEL OF FERTILTIY DESIRE WITH OVERALL BIRTHS (FMODELIII)

Term	Odds Ratio	95% C.I.	Co-efficient	S. E.	Z-Statistic	P-Value
Use of contraceptive						
Yes/No	0.6408	0.2551 1.6096	-0.445	0.4699	-0.9471	0.3436
Partner fertility desire						
Yes/No	<u>17.2502</u>	<u>3.493</u> <u>85.1906</u>	2.8478	0.8148	3.4949	<u>0.0005</u>
Resident						
Urban/Rural	2.0401	0.6581 6.324	0.713	0.5772	1.2352	0.2167
Total births						
0-2 births/>2 births	<u>3.5473</u>	<u>1.1989</u> <u>10.4962</u>	1.2662	0.5535	2.2877	<u>0.0222</u>
Use of contraceptive * total births	0.6255	0.1725 2.2684	-0.4692	0.6573	-0.7138	0.4753
Partner fertility desire *	0.9539	0.1707 5.3288	-0.0472	0.8777	-0.0538	0.9571
Resident	*	* *	-2.1719	0.645	-3.3671	<u>0.0008</u>
CONSTANT						
Convergence:	Converged					
Iterations:	6					
Final -2*Log-Likelihood:	289.2841					
Cases included:	327					
Test	Statistic	D.F.	P-Value			
Score	143.1806	6	0.0000			
Likelihood Ratio	160.6982	6	0.0000			

4.8.2 Summary of the Multivariable Analysis of Fertiltiy Desire

The number and experiences of births after HIV diagnosis is found to be negatively associated with fertilty desire. Study participants who reported to have at least a birth after they were diagnosed to be infected with HIV are less likely to desire for a/nother birth in the future (Adjuted Odds ratio (AOR): 0.4817, 95% CI 0.2564-0.9047, p-value=0.0231).

Variables	Categories	Bivariate			Multivariable		
		OR (95%CI)	Co-efficient	p-value	AOR (95%CI)	co-efficient	p-value
Age		0.93 (0.9-0.96)	-0.07	0.0000	0.96(0.91-1.02)	-0.04	0.1997
Religious affiliation							
	Muslim/Catholic and others	5.12(1.37-19.08)	1.63	0.0151	1.42(0.14-14.42)	0.35	0.768
	Orthodox/Catholic and Others	3.40(1.12-10.36)	1.23	0.031	0.70(0.10-5.0)	-0.3614	0.7187
	Protestant/Catholic and Others	4.40(1.44-13.36)	1.48	0.0091	1.56(0.23-10.62)	0.44	0.6513
Marital/relationship status							
	Never married single/Married	2.64 (1.21-5.80)	0.97	0.0152	0.00(0->1.0E12)	-13.21	0.9766
	Widowed/Married	0.29(0.14-0.60)	-1.23	0.0009	N/A	N/A	N/A
	Non-married partner/Married	6.30 (1.4-29.20)	1.84	0.0188	0.91(0.11-7.57)	-0.09	0.9322
	Divorced/Married	0.99 (0.54-1.80)	-0.04	0.9718	0.00(0.00->1.0E12)	-14.34	0.9746
Educational level							
	High school and above/Below high school	1.55(1.07-2.26)	0.44	0.0202	0.83(0.46-1.90)	-0.07	0.8359
Occupation							
	Employed/Daily laborer	0.97 (0.53-1.77)	-0.04	0.9088	0.84(0.27-2.60)	-0.18	0.76
	Housewife/daily laborer	0.45(0.22-0.92)	-0.79	0.0284	0.59(0.20-1.80))	-0.5212	0.3584
	Merchant/Daily laborer	1.18(0.61-2.27)	0.17	0.6177	0.68(0.23-2.03)	-0.39	0.4889
	Unemployed/Daily labourer	0.77(0.39-1.52)	-0.26	0.4528	0.84(0.24-3.00)	-0.1733	0.7881
Resident							
	Urban/Rural	3.3 (1.80-6.05)	1.19	0.0001	2.04(0.66-6.32)	0.71	0.2167
Household family size							
	More than 3/1-3	0.35 (0.24-0.52)	-1.05	0	0.43 (0.22-0.86)	-0.83	<u>0.0167</u>
Total births							
	0-2 births/>births	3.62 (2.43-5.41)	1.29	0	3.55(1.20-10.5)	1.27	<u>0.0222</u>
Birth after HIV diagnosis							
	Yes/No	0.64(0.42-0.98)	-0.44	0.0406	0.48 (0.26-0.90)	-0.73	<u>0.0231</u>
Duration in relationship with partner							
	>=11 years/1-10 years	0.42(0.27-0.66)	-0.87	0.0002	0.94(0.45-1.95)	-0.06	0.8663
Disclosed HIV status to partner							
	Yes/No	0.26 (0.07-0.99)	-1.33	0.0488	2.27(0.76-6.78)	0.82	0.141
Partner fertility desire							
	Yes/No or unknown	20.22(11.43-35-78)	3.01	0	17.25(3.50-85.19)	2.85	<u>0.0005</u>
Use of Contraceptive							
	Yes/No	0.65(0.45-0.95)	-0.42	0.0251	0.64 (0.26-1.61)	-0.45	0.34
Use of Condom							
	Yes/No	1.56(0.84-2.88)	0.44	0.1607	1.94(0.66--5.7)	0.66	0.2283

The over all total birth reported by the respondents is also strogly associated with participants fertiltiy desire. Adjusted for possible confounders study participants who had had 2 or less total births are 3.55 times more likely to desire for future birth (Adjsted Odds Ratio (AOR): 3.55, 95% CI 1.20-10.50, p-vaule=0.0222). Or else, the high overall births experined by the participants the less likely they want to have a future pregnancy.

Adjusted for possible confounders the multivariable analysis involving family size has shown that it is negatively and strogly related with fertiltiy desire (Adjuted Odds Ratio (AOR): 0.43, 95 % CI 0.22-0.86, p-value=0.0167). In other words, controlled for possible confounders study participants who reported to have a household family size of 4 or more are 56.56% less likely to desire for future childbearing.

The reported partner fertiltiy desire by the study participants is posetively and strongly associated with fertiltiy desire (Adjusted Odds ratio (AOR):17.25, 95% CI 3.50-85.20, p-value=0.0005). Or else, partner fertilty desire is a stronger predictor of fertiltiy desire in PLHIV.

The above table is a summary of bivaraitte and multivariable logistic analysis. Variables having an associtation with fertility desire during the bivariable analysis at p-value<0.25 are involved in the multivariable analysis. Due to the confounding and effect modifiers only household family size, total birth, birth experince after HIV diagnosis and partner fertility desire remained to be significantly associated with fertility desire at 5% significant level. In short, the researchers in the fertility desire & intention study have found out that experience of births after HIV diagnisis, total births owned, household family size, and partner fertilty desire were independently associated with a desire to bear a child in Hawassa city. Study participants who reported to live with at most 4 family members, having 2 or less births but with no experience of birth after they were aware of their HIV sero-status, and whose partner reported to wish for a child in the future are found to desire for a/nother in the future. How many children they desire or inted for? This will be answered in the next section of fertiltiy intention.

4.9 FERTILITY INTENTION (N=450)

Four hundred fifty participants had responded for the question "How much children do you intend to give?". Almost all of those who responded to desire (99%) for a child also reported to intend for at least a child. Thus, among those desiring children, only 1% did not intend to bear

any children in the future. An aggregate of 45 % (202/450) participants reported they intended to have a child during the data collection period. See figure below.

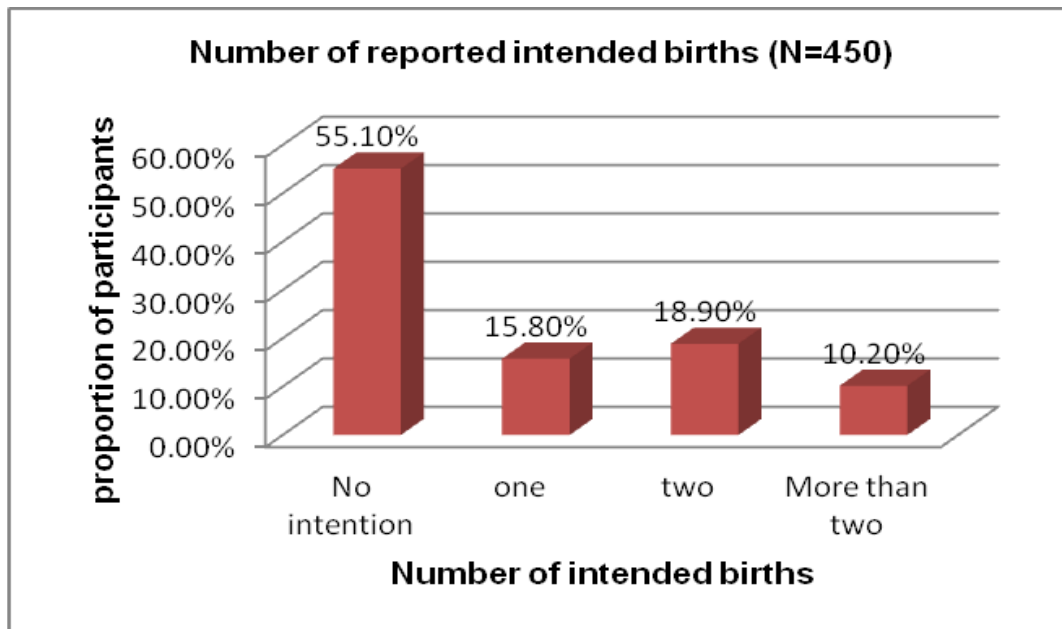


Figure 4.18: Bar graph showing proportion of respondents for fertility intention, Hawassa 2012.

The reported overall median number of intended children was 2.

4.9.1 Fertility Intention and Socio-demographic Characteristic of the Study Participants

4.9.1.1 Fertility Intention and Age of the Study Participants (N=450)

As the age of the participants goes up, the proportion of respondents intended not to have birth seems increasing from 10(40%) in age category of 15-24 years to 21(77.8%) in the age group of 45-54 years. Participants in the age category of 25-34 took a higher proportion to intend for two births (25.7%) and a higher number (23) to intend for more than two births. Respondents in the age group of 45-54 years were the least to intend, 6(22.2%). They were those in the age group of 15-24 years that had got the highest proportion (60%) of intending at least one birth in the future. See table below.

TABLE 4.28: FREQUENCY OF NUMBER OF INTENDED PREGNANCY BASED ON THE AGE CATEGORY OF STUDY PARTICIPANTS, HAWASSA TOWN 2012

No.	Age Category in years	No intention frequency (%)	One birth frequency (%)	Two births frequency (%)	More than two births Frequency (%)
1	15-24	10(40)	7(28)	5(20)	3(12)
2	25-34	107(48.2)	35(15.8)	57(25.7)	23(10.4)
3	35-44	110(62.5)	27(15.3)	22(12.5)	17(9.7)
4	45-54	21(77.8)	2(7.4)	1(3.7)	3(11.1)
5	Total	248(55.1)	71(15.8)	85(18,9)	46(10.2)

It can also be computed that there is an association between the number of intended children and age of the participants. Intention to have a child has got an inverse relation with age of the participants. Respondents in the age range of 45-54 years and 35-44 years are 81% and 60% less likely to intend at least one child in the future as compared to participants in the age ranges of 15-24 years respectively. It could also be said that respondents with younger age are less likely not to intend for a birth in the future (Odds ratio(OR):0.93; 95% CI, 0.9-0.96, p-value=0.0000).

4.9.1.2 Fertility Intention and Gender (N=450)

Equivalent number and proportion of male and female participants were found to intend for future births. See table below. Around 35 (15.5%) of female participants and 36(16.1%) of male respondents did intend to have one birth. So there is no difference in the number of intended children in the future reported by male and female participants (Odds Ratio (OR): 1.13 95%CI 0.78-1.64, p-vlaue=0.5133).

TABLE 4.29: FREQUENCY OF FERTILITY INTENTION BASED ON GENDER, HAWASSA 2012

No.	Gender	No intention	One birth	two births	More than two births	Chi-square	df	P-value
1	Female	128 (56.6)	35(15.5)	44(19.5)	19(8.4)	1.76	3	0.62
2	Male	120(53.6)	36(16.1)	41(18.3)	27(12.1)			
3	Total	248(55.1)	71(15.8)	85(18.9)	46(10.2)			

It can also be computed that 63(23.9%) of the females and 68(30.4%) of the men intend to have 2 or more than 2 children.

4.9.1.3 Fertility Intention and Ethnic Group of Study Participants (N=450)

From the major tribes, 44 (53.7%) Wolayitas intend to have at least a birth as compared to 29 (40.3%) of the Oromos who did plan to have at least a child in the future. One hundred and six Amhara respondents had responded for the fertility intention; 60(56.6%) of which did not intend to have a child whereas 46(43.4%) of them reported having a plan to have at least a birth in the future. Sixty-two (59.6%) of the Sidamas responded they did not plan to have a child whereas 42(40.4%) of them did respond as they have a plan to have a birth in the near future. There is no statistically significant association noted between the number of intended children and the ethnic group of the study participants (p-value 0.92).

4.9.1.4 Fertility Intention and Religion of the Study Participants (N=450)

A higher number of Catholic and the others, 19 (82.6%), responded not to intend for a birth in the future. On the contrary, 14(53.8%) of the Muslims did plan to have one or more births, the highest proportion out of the four religious categories. In addition, quite more than half (57.4%) of the Orthodox did respond having no plan to have a birth in the future.

There is an association between fertility intention and religion of the study participants where the majority of Catholic and other minor religious groups did not plan to have a child ($P < 0.05$). The majority of Muslim did rather intend to have one or more births in the future. However, the

association between fertility intention and religion affiliation of the study participants is computed to be confounded by partner fertility desire.

4.9.1.5 Fertility Intention and Marital Status of Study Participants (N=450)

The following table indicates that the majorities of participants who reported to be widowed, 40(80%), and divorced, 27(55.1%), said that they didn't have an intention of having a child in the near future. In fact, the highest number of married participants, 170(55%), responded they had no intention of childbearing.

Though the absolute number is smaller, 21(70%) of single and 10(83.3%) of non-married partner had responded to plan for future childbearing.

TABLE 4.30: FREQUENCY OF FERTILITY INTENTION BASED ON THE MARRITAL STATUS OF THE PARTICIPANTS, HAWASSA 2012

No	Marital Status	No intention Frequency (%)	One birth Frequency (%)	Two births Frequency (%)	More than two births Frequency (%)
1	Married	170(55)	49(15.9)	53(17.2)	37(12)
2	Single/never married	9(30)	8 (26.7)	12 (40)	1(3.3)
3	Widowed	40(80)	6(12)	1(2)	3(6)
4	Non-married partner	2(16.7)	3(25)	4(33.3)	3(25)
5	Divorced	27(55.1)	5(10.2)	15(30.6)	2(4.10)
6	Total	248(55.1)	71(15.80)	85(18.9)	46(10.20)

The marital status is shown to have an association with fertility intention. There is a negative association between fertility intention and the widowed and divorced partners. However, there is a positive association between fertility intention and those participants who were never married single and non-married partners. Thus, as compared to married respondents widowed participants are less likely to intend to have a birth. Yet, those who were single and non-

married partners were found to intend for a childbearing 3 and 6 times more likely as compared to those who were married. See table below.

TABLE 4.31: THE ASSOCIATION BETWEEN FERTILITY INTENTION AND MARRITAL STATUS OF THE STUDY PARTICIPANTS, HAWASSA 2012

Term	Odds Ratio	95% C.I.	Co-efficient	S. E.	Z-Statistic	P-Value	
Marital relationship Status							
Single/Married	<u>2.8537</u>	<u>1.2665</u>	<u>6.4303</u>	1.0486	0.4145	2.5299	<u>0.0114</u>
Widowed/Married	<u>0.3058</u>	<u>0.1476</u>	<u>0.6334</u>	-1.185	0.3716	-3.189	<u>0.0014</u>
Non-married							
partner/married	<u>6.1151</u>	<u>1.3181</u>	<u>28.37</u>	1.8108	0.783	2.3127	<u>0.021</u>
Divorced/married	0.9965	0.5437	1.8266	-0.0035	0.3091	-0.0112	0.991
CONSTANT	*	*	*	-0.2013	0.1144	-1.7606	0.0783

However, this relationship is confounded by the household family size and total births reported.

4.9.1.6 Fertility Intention and Highest Educational Level of the Study Participants (N=450)

Thirty-six (70.6%) participants who could not read and write reported no intention of childbearing followed by 115 (57.2%) of those who attended primary and junior school. On the contrary, 81(52.2%) of those who had attended high school and 30(48.9%) of those already attended college or University reported the plan to have at least a birth in the future.

In general, there is an evidence that participants with high school or higher educational level intends to have more births as compared to those with below high school (Odds Ratio(OR):1.56, 95% CI 1.07-2.27, p-value=0.021).

It was also computed that residential area is found to be an effect modifier between fertility intention and educational level of the participants (Crude Odds Ratio (COR): 1.56, Adjusted Odds Ratio(AOR): for rural: 2.1 and for urban: 1.32, p-value for test of effect modifier=0.50 ($p>0.05$).

4. 9.1.7 Fertility intention and occupation of the study participants (N=445)

Fifty-seven(72.2%) respondents who said that they were housewives didn't plan to have a birth in the future followed by the 43(56.6%) of the unemployed, 30 (52.6%) of the daily laborer and 75(52.4%) of the employed participants. Forty-nine (59%) participants who were merchants by profession planned to have at least one child in the future.

4.9.1.8 Fertility Intention and Residential Area of the Study Participants (N=445)

As can be seen in the figure below 52 (78%) rural residents reported not to intend a birth as compared to the 196 (51.2%) of the urban counterparts. In other words, the proportion of urban dwellers (49.8%, 187) is higher than the rural (22%, 15) who planned to have at least a birth in the future.

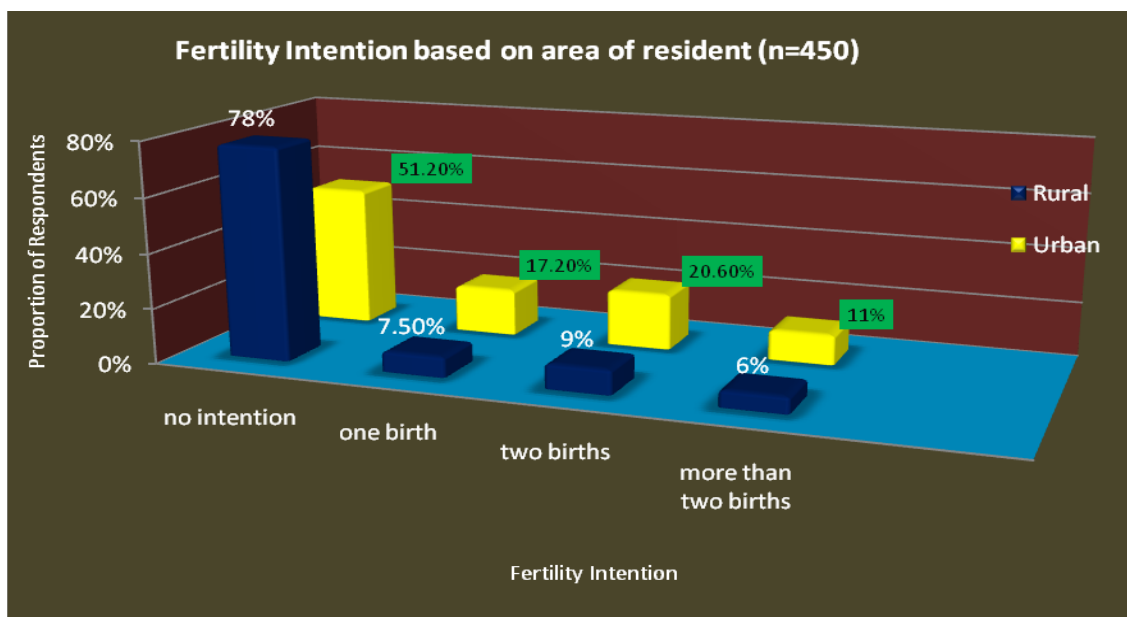


Figure 4.19: A bar graph with proportion of fertility intention stratified by area of resident

It was also found that there is a positive association between fertility desire and being an urban resident. Participants residing in the urban area are about 3 times more likely to plan for childbearing in the future (Odds Ratio (OR) 3.3 95% CI 1.8-6.1, p-value=0.0001). However, this association is confounded by reported total births (COR: 3.1, AOR: 2.60) and partner fertility desire (COR: 3.1, AOR: 2.4). The household family size was also found to be an effect modifier of the relationship between fertility intention and residential area (COR: 3.1 AOR for 2 or more family size: 4.01 and less than 2 family size: 1.57 and test of effect modifier=0.42 ($p < 0.05$)).

4.9.1.9 Fertility Intention and Average Monthly Income of the Study Participants (N=445)

As the income of study participants is increasing the intention to have two births is decreasing from 21.1% to 6.7%. However, as the income is increasing the intention for more than two births is increasing from 8% to 26.7%. Such pattern is not noted in the no intention and one birth intention. The least to intend was reported in no income or unknown income category. See table below.

TABLE 4.32: FREQUENCY OF FERTILITY INTENTION AND AN ESTIMATED MONTHLY INCOME, HAWASSA 2012

No.	Monthly Income	No intention frequency (%)	Onebirth frequency (%)	Two births frequency (%)	More than two births frequency (%)
1	No income or unknown	120(56.3)	31(14.6)	45(21.1)	17(8)
2	<1000	73(53.70)	24(17.6)	24(17.60)	15(11)
3	1000-2999	47(55.30)	13(15.3)	15(17.6)	10(11.8)
4	>=30000	7(46.7)	3(20)	1(6.7)	4(26.7)
5	Total	247(55%)	71(15.80)	85(18.9)	46(10.2)

Still, there is no statistically significant association between average monthly income and fertility desire (p -value=0.61).

4.9.1.10 Fertility Intention and Family Size in the Household of the Study Participants (N=445).

About 189 (64.3%) of participants with at least four family size in the household had responded that they had no plan to have a child as compared to only 59 (37.8%) of those with a family size of 1-3 responding. As it could also be seen on the following figure 83(53.2%) respondents with a family size of 1-3 were intending to have one or two births as compared to only 73(24.8%) of participants reporting a family size of more than three.

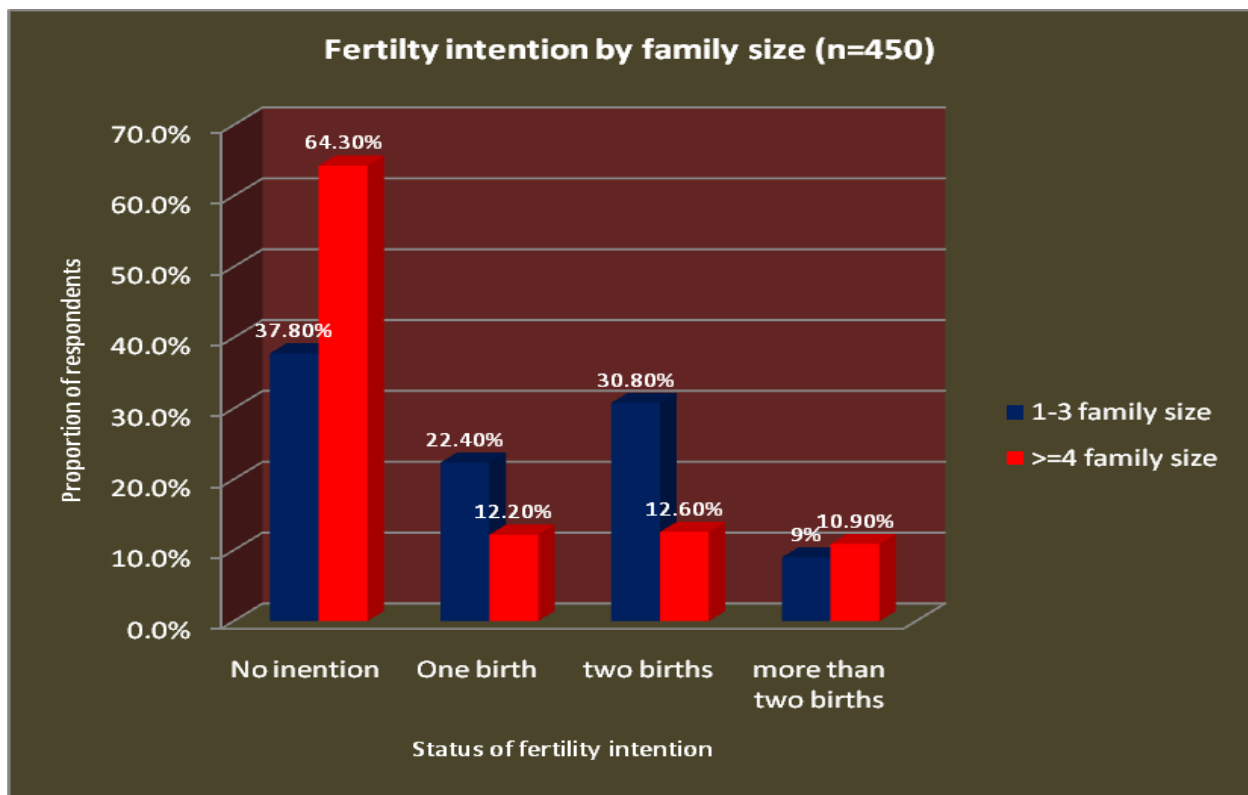


Figure 4.20: A bar graph indicates proportion of fertility intention based on household family size

There is statistically significant association between fertility intention and household family size. Study participants with four or more family size in the household were less likely to intend for extra one or more children as compared to those with fewer than three family size (Odds ratio(OR):0.3379, 95%CI 0.2261-0.5051, p-value=0.0000). Compared to participants with a family size of 1-3, respondents with a family size of 4-6 and more than six were found to be 60% and 84% less likely to intend for a child in the future.

Out of the socio-demographic variables, fertility intention has no statistically significant association with respondents sex, ethnic group and average monthly income. Nevertheless, there is a relation between fertility intention and respondents age, religion, occupation, marital status, educational level, residential area and family size in the household. It means that a single or non-married younger daily laborer participants who were non-Catholic residing in urban area having a fewer than three family size and who attended at least high school were more likely to plan to have at least a child in the future.

4.9.2 Fertility Intention and HIV and ART History

4.9.2.1 Fertility Intention and Duration after HIV Diagnosis (N=450)

Close to 56% (227) participants who had known their HIV status for 12 months or more reported not to have a child as compared to 21 (47.7%) of those who had known their HIV serostatus less than 12 months age. Twenty (45.4%) of participants who knew their HIV status for less than 12 months intended to have one and two births whereas 136 (33.5%) of the respondents who had known their HIV status 12 months or more planned to have one or two births in the future. Forty-three (10.6%) of the participants who had already known their sero-status 12 months or more intend to have more than two children as compared to 3(6.8%) of those who had known to live with the virus less than 12 months.

TABLE 4.33: FREQUENCY OF FERTILITY INTENTION STRATIFIED BY DURATION AFTER HIV DIAGNOSIS, HAWASSA 2012.

No.	Duration after HIV diagnosis	No intention frequency (%)	Onebirth frequency (%)	Twobirths frequency (%)	Morethan two births (%)	Chi-square	Df	p-value
1	<12 months	21(47.7)	10(22.7)	10(22.7)	3(6.8)	2.9085	3	0.406
2	>=12 months	227(55.9))	61(15)	75(18.5)	43(10.6)			
3	Total	248(55.1)	71(15.8)	85(18.9)	46(10.2))			

However, there is no statistically significant association between fertility intention and duration after HIV diagnosis (p-value=0.3).

4.9.2.2 Fertility Intention and Status of ART Initiation (N=357)

The majority of participants who started ART (55.8%) and not started ART(52.2%) did report not to intend for a birth. However, 63(17.5%) of participants who had already started on ART and 22(24.4%) of those who had not been put on ART plan to have two births. The lower proportion of those on ART (11.4%) and not on ART (5.6%) intend to have more than two births. Yet there is no statistically significant association between status of ART initiation and fertility intention. See table below

TABLE 4.34: FREQUENCY OF FERTILITY INTENTION BASED ON STATUS OF ART INITIATION, HAWASSA 2012

No.	Have you started ART?	No intention frequency (%)	One birth frequency (%)	Two births frequency (%)	More than two births (%)	Chi-square	df	p-value
1	Yes	201(55.8)	55(15.3)	63(17.5)	41(11.4)	4.6905	3	0.1959
2	No	47(52.2)	16(17.8)	22(24.4)	5(5.6)			
3	Total	248(55.1)	71(15.8)	85(18.90)	46(10.2)			

4.9.2.3 Fertility Intention and Duration after ART Initiation(N=357)

More than half of those who had been on ART for less than 12 months (54%) and those who were on ART for 12 months or more (56.4%) were found to intend no birth in the future. Two births was found to be planned in 11(22) % of those who had been on ART for less than 12 months and in 52(16.9%) of those who had been on ART for 12 months or more. A fewer proportion of those who had been on ART less than 12 months (12%) and for 12 months or more (11.4%) were reported to plan for more than two births in the future.

TABLE 4.35 FREQUENCY OF FERTILITY INTENTION STRATIFIED WITH DURATION AFTER ART INITIATION, HAWASSA 2102

No.	Duration on ART	No intention frequency (%)	One birth frequency (%)	Two births frequency (%)	More than two births (%)	Chi-square	df	p-value
1	<12 months	27(54)	6(12)	11(22)	6(12)	0.9974	3	0.80
2	>=12 months	173(56.4)	47(15.3)	52(16.9)	35(11.4)			
3	Total	200(56)	53(14.80)	63(17.6)	41(11.5)			

No association has been noted between fertility desire and duration after ART initiation (p-value=0.8). When the bivariate analysis is done for no intention and intended for birth per each month, there is no statistically significant association was also found (Odds Ratio(OR):1.0002, 95%CI 0.9911-1.0094, p-value=0.9636).

4.9.2.4 Fertility Intention and Health Status after ART Initiation (N=359)

The majority of participants in all the category of health status after ART planned not to have a birth in the future. See table below. So there is no association between the fertility desire and status of health after ART initiation (p-value=0.6).

TABLE 4.36: FREQUENCY OF FERTILITY INTENTION AND HEALTH STATUS OF STUDY PARTICIPANTS, HAWASSA 2012

No.	Health status after ART	No intention frequency (%)	One birth frequency (%)	Two births frequency (%)	More than two births (%)	Chi-square	Df	p-value
1	Improved	188(55.8)	50(14.8)	59(17.5)	40(11.9)	4.54	6	0.6
2	Aggravated	8(72.7)	1(9.1)	1(9.1)	1(9.1)			
3	No change	5(45.5)	3(27.3)	3(27.3)	0(0)			
4	Total	201(56)	54(15)	63(17.5)	41(11.4)			

In summary, variables in the HIV/ART history were not associated with fertility intention.

4.9.3 Fertility Intention and Fertility history

4.9.3.1 Fertility Intention and Total Births Reported by Participants (N=434)

As the reported number of children owned by the study participants is increasing the plan not to have a birth is also increasing from 8.8% in participants with no birth to 78% of respondents with more than three births. They were participants already having no child (17.6%) or one child (12.5%) that plan to have more than two. Nearly 59% of respondents with no child planned to give births to two births and only 8.8% of them have with out an intention to have a birth in the future. Most participants with one child (27.3%), two children (17.4%) and more than three children (7.9%) planned to have one birth.

There is strong statistically significant association between total number of birth reported to be experienced by the respondents and their fertility intention. As can be seen in the table below, the plan to have a birth in the future is increasing 2 times in those participants having three births to 37 time in those with no birth experience as compared to participants with more than three birth experiences. Thus, participants reported to have no child or fewer children are more likely to plan to have more or extra children in the future (Odds Ratio (OR):3.56, 95%CI 2.38-5.33, p-value=0.0000).

TABLE 4.37: ASSOCIATION BETWEEN FERTILITY INTENTION AND TOTAL BIRTHS REPORTED BY THE STUDY PARTICIPANTS, HAWASSA 2012.

Term	Odds Ratio	95% C.I.	Co-efficient	S. E.	Z-Statistic	P-Value	
Total births Owned							
No births/more than three	<u>36.5357</u>	<u>10.3933</u>	<u>128.43</u>	3.5983	0.6414	5.61	<u>0.0000</u>
one/morethan three	<u>6.8357</u>	<u>3.7197</u>	<u>12.562</u>	1.9222	0.3105	6.1912	<u>0.0000</u>
Two/morethan three	<u>2.3934</u>	<u>1.3565</u>	<u>4.2229</u>	0.8727	0.2897	3.0125	<u>0.0026</u>
three/morethan three	<u>2.0625</u>	<u>1.1017</u>	<u>3.8613</u>	0.7239	0.3199	2.2627	<u>0.0237</u>
CONSTANT	*	*	*	-1.2629	0.214	-5.9002	<u>0.0000</u>

4.9.3.2 Fertility Intention and Number of Births after HIV Diagnosis (N=434)

As the number of births experienced after HIV diagnosis is increasing, the plan not to have a child is increasing from 9.4% for those with no births after HIV diagnosis to 71.4% for those who had already experienced more than 2 children after HIV diagnosis. On the other hand, the number of participants planned to have one birth in the future is decreasing as the experienced number of child after HIV diagnosis is increasing from no birth (47) to more than 2 children(3). Most participants with no births after HIV diagnosis (21.5%) planned to have 2 births in the future whereas respondents with only one child after HIV diagnosis (13.2%) intended to have more than 2 children in the future. See table below.

TABLE 4.38: FREQUENCY OF FERTILITY INTENTION BASED ON THE NUMBER OF BIRTHS AFTER HIV DIAGNOSIS, HAWASSA 2012

No.	Number of Births after HIV diagnosis	No intention frequency (%)	One birth frequency (%)	Two births frequency (%)	More than two births (%)
1	No births	29(9.4)	47(15.3)	66(21.5)	29(9.4)
2	One	65(61.3)	17(16)	10(9.4)	14(13.2)
3	>=two	15(71.4)	3(14.3)	2(9.5)	1(4.8)
4	Total	245(56.5)	67(15.4)	78(18)	44(10.1)

However, there is a weak association between number of births after HIV diagnosis and intended number of births in the future at 10% significant level (Odds Ratio (OR): 0.6827, 95% CI 0.4466-1.0435, p-value=0.0779) when binary logistic regression is done for no intention and intended, with no birth and a birth after HIV diagnosis category. Otherwise, the detailed binary analysis at 5% level of significance is with no association.

4.9.3.3 Fertility Intention and Number of Births after ART Initiation (N=434)

Sixty-four (18.8%) of those participants with no child after ART intended to have two births in the future. Eleven(18%) of respondents who had already one child after ART planned to have more than two births in the future. As expected no respondents already having more than two births after ART planned neither to have 2 births nor more than 2 births. The proportion of respondents planned no to have a child is increasing as the number of births already experienced after ART is increasing from no birth (56.9%) to 2 or more than 2 births (71.4%).

TABLE 4.39: FREQUENCY OF FERTILITY INTENTION AND NUMBER OF BIRTHS AFTER ART INITIATION, HAWASSA 2012

No.	Number of Births after ART initiation	No intention frequency (%)	One birth frequency (%)	Two births frequency (%)	More than two births (%)
1	No births	194(56.9)	51(15)	64(18.8)	32(9.4)
2	One	35(57.4)	9(14.8)	6(9.8)	11(18)
3	>=two	5(71.4)	2(28.6)	0(0)	0(0)
4	Total	234(57.2)	62(15.2)	70(17.1)	43(10.5)

There is no statistically significant association noted between number of birth after ART initiation and intention for fertility (p-value=0.45). The association is not observed though the analysis is done categorizing fertility intention into no intention and intended, and no birth and birth experienced after ART (Odds Ratio(OR): 0.92, 95% CI 0.54-1.57, p-value=0.77).

It can be said that the number of births intended to have in the future is associated strongly with total births reported by the respondents during the data collection and weakly associated with experience of births after HIV diagnosis. However, intention to have a birth in the future has no association with birth experience after ART initiation.

4.9.4 Fertility Intention and Partner Characteristics of Study participants

4.9.4.1 Fertility Intention and Duration in Relationship (N=329)

The greater proportion of participants who were in relationship for 11 or more years (67.4%) were having no plan to have a birth in the future as compared to only 46.2% of those who were in relationship for 1-10 years. However, 41.6% of respondents who were in a relationship for 1-10 years intended to have one or two births in the future as compared to only 20.5% of those who were living together for 11 or more years. Almost equal proportion of both categories of respondents were planning to have more than two births in the future. See figure below.

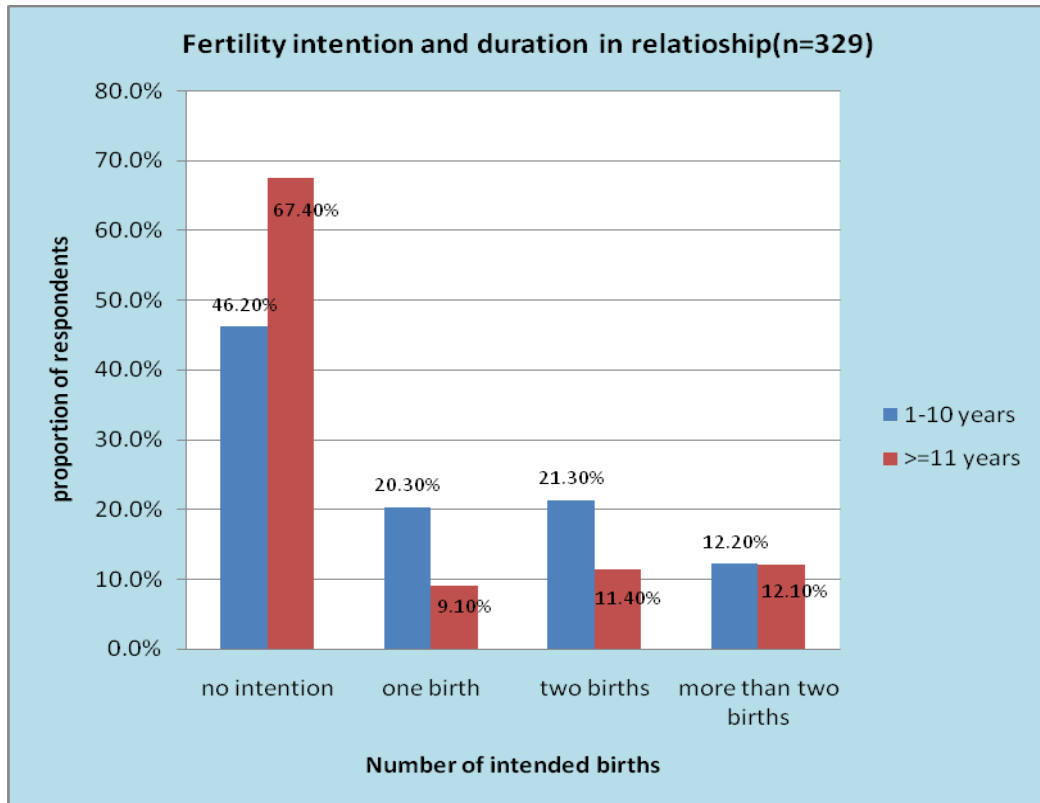


Figure 4.21: A bar graph showing intention for birth stratified by duration in relationship

There is a negative association between fertility intention and duration stayed in relationship. Study participants who were in relationship for longer period of time were less likely to plan for a birth in the future (Odd Ratios (OR): 0.9078 95% CI 0.8745-0.9423, p-value=0.0000). In other words, participants who were together in relation for 1-10 years were more likely to plan to have at least a birth in the future. However, the relationship between fertility intention and duration in relationship is confounded by the partner fertility desire (COR=2.4; AOR=1.15).

4.9.4.2 Fertility Intention and Disclosure of HIV Status to Partner (N=325)

One hundred seventy-three (55.1%) of respondents who had already told their HIV status to their partner reported not to intend to have a birth in the future. One hundred and three (32.8%) of partners who had already disclosed their serostatus planned to have one or two births in the future. Though the absolute number is smaller, the majority of participants who hadn't disclosed their HIV status to their partner, 9(81.8%), did report to have a plan to have at least a birth in the future. See table below.

TABLE 4.40: FERTILITY INTENTION BASED ON THE STATUS OF DISCLOSURE OF HIV STATUS TO A PARTNER, HAWASSA 2012

No.	Disclosed HIV status to partner	No intention frequency (%)	One birth frequency (%)	Two births frequency (%)	More than two births frequency (%)
1	Yes	173(55.1%)	50(15.9)	53(16.9)	38(12.1)
2	No	2(18.2)	2(18.2)	5(45.5)	2(18.2)
3	Total	175(53.8)	52(16)	58(17.8)	40 (12.3)

It could be computed that 141(44.9%) of respondents who did tell their serostatus to their partner plan to have at least a child. Eventhough the absolute number is smaller, the lower proportion of those respondents who fail to disclose their HIV status to their partner, 2(18.2%), didn't intend to have a child. In other words, study participants who did disclose their HIV serostatus are found to intend for future pregnancy less likely as compare to those who did not tell their HIV status to their partner (Odds Ratio (OR) 0.2 95% CI 0.03-0.85,p-value=0.03).

4.9.4.3 Fertility Intention and Knowledge of Partner HIV Status (N=322)

More than half of participants (55.3%) who had already known the HIV status of their partner did not have an inteniton to have a birth. Rather, 44.7% of them planned to have at least birth in the future. Only 8 of the 20 participants who did not know theHIV status of their partner reported that they have no intention to have achild in the future.

TABLE 4.41: FREQUENCY OF FERTILITY INTENTION BASED ON THE KNOWLEDGE OF THEIR PARTNER HIV STATUS, HAWASSA 2012

No.	Knowledge of partner HIV status	No intention frequency (%)	One birth frequency (%)	Two births frequency (%)	More than two births frequency (%)
1	Unknown	8(40)	4(20)	6(30)	2(10)
2	Known (HIV +VE or HIV-ve)	167(55.3)	48(15.9)	51(16.9)	36(11.9)
3	Total	175(54.3)	52(16.1)	57(17.7)	38(11.8)

Bivariate analysis of fertility intention with knowledge of partners' HIV status reveals no association (p -value=0.19). Categorizing partner's HIV status into positive and negative and analysing with fertility intention is yet without statistically significant association.

4.9.4.4 Fertility Intention and Partner Fertility Desire (N=322)

A higher proportion of respondents whose partner reported to be desiring no birth in the future (88.1%) were not planning to have any birth in the future. This proportion is declining as the number of intended birth is increasing from 4.2% of one birth to 3.5% of more than two births. On the other hand, 83.7% of respondents whose partner desire to have fertility in the future also intend to have at least a birth in the future. Most of them (60.7%) intended to have 1 or 2 births in the future. The majority of the respondents (59.1%) whose partner fertility desire was unknown had intended to have no birth at all. See the following figure .

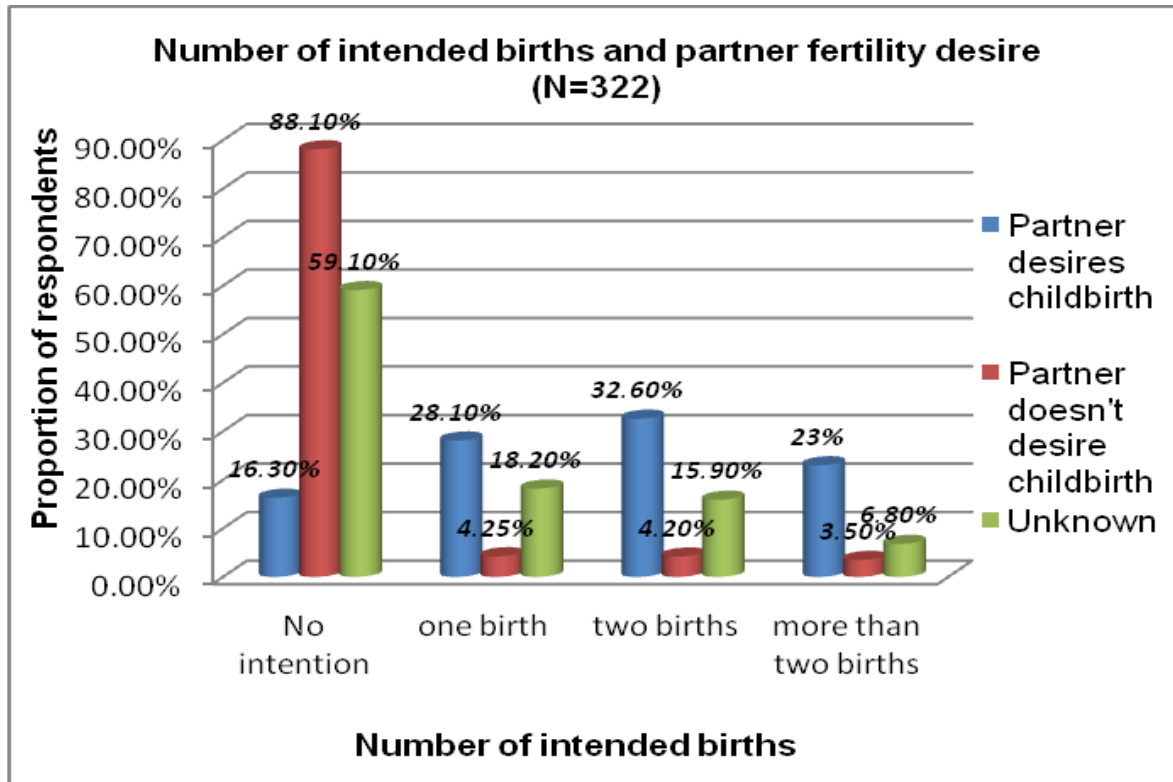


Figure 4.22: A bar graph of fertility intention stratified based on the reported partner fertility desire

There is a strong and positive association between fertility intention and respondents partner fertility desire. Respondents whose partner reported to desire for future fertility were more likely to intend to have at least one child in the future (Odds Ratio (OR): 22.31, 95% CI 12.41-40.09, p -value=0.0000). As compared to respondents partners' with no desire to have a fertility, those participants whose partners' fertility desire is unknown and whose partners' reported to desire for future fertility were 5 and 38 times more likely to plan to have at least one birth.

All variables of partners characteristic except knowledge of partner HIV status have an association with fertility intention at 5% significant level. That is participants who were together with their partner for 1-10 years, who didn't tell their HIV status to their partner and whose partner would like to have a birth were found to intend for a birth in the near future.

4.9.5 Fertility Intention and History of Family Planning

4.9.5.1 Fertility Intention and Use of Contraceptive (N=450)

About 144 (59.8%) of respondents who reported to use a contraceptive during data collection said that they had no plan to have a birth in the future. However, 105(50.2)% of those respondents who were not using a family planning intend to have at least one child. Close to 39% of those who were not using a contraceptive reported to intend for one or two births. See the following figure.

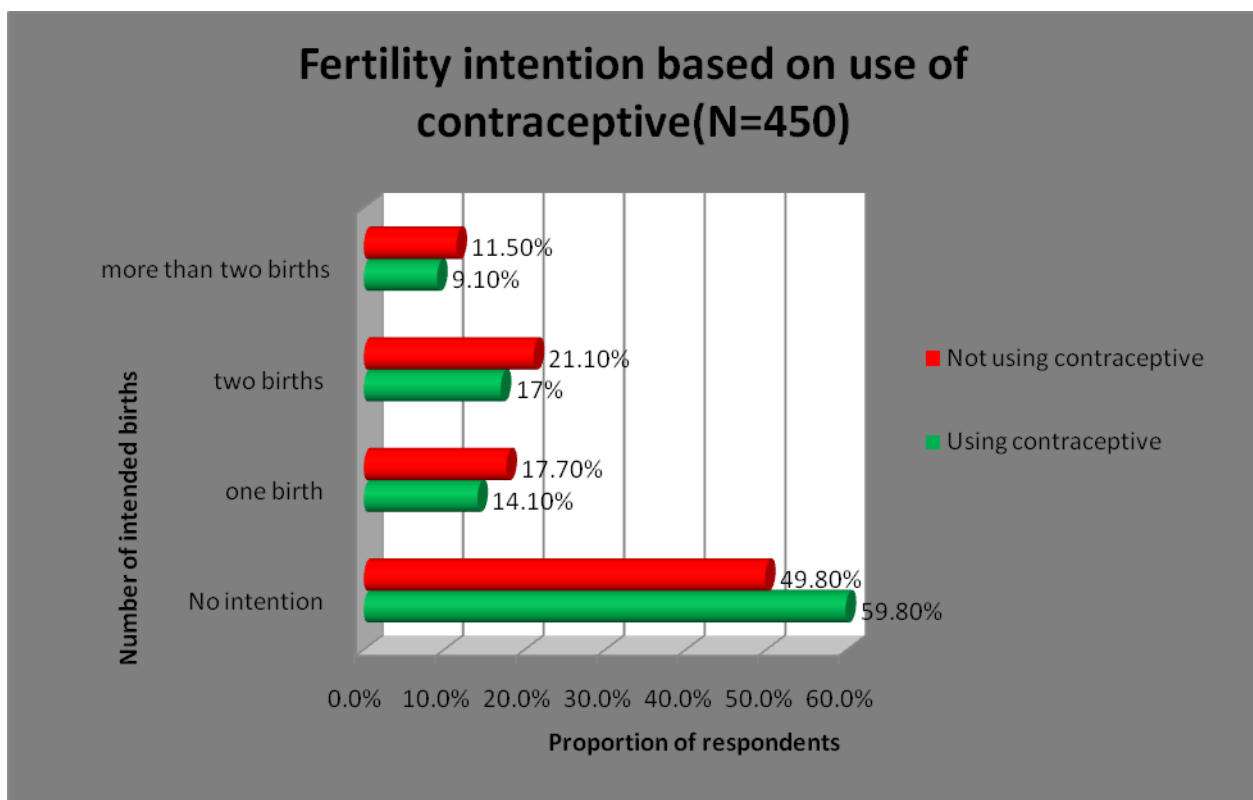


Figure 4.23: A bar graph indicating fertility intention and use of family planning

Thus, it seems that respondents who were planning to have at least one birth in the future were not using a family planning. This is well evidenced by the bivariate analysis which showed that participants who were not using a contraceptive were found to be 1.5 times more likely to plan for a birth in the future (Odds ratio (OR) 1.499 95% CI 1.03-2.2, p-value=0.0339).

4.9.5.2 Fertility Intention and Partner Use of Contraceptive (N=324)

As expected, 117(55.5%) of respondents who had no plan to have birth reported that their partner were using contraceptive. Significant proportion of respondents whose partners were

not using contraceptive (52.2%) also intended to have a child in the future. Forty-two (37.2%) respondents whose partner were not using contraceptive also planned to have a birth.

However, there is no statistically significant difference between partner use of contraceptive and respondents' intention for fertility (p -value=0.5772).

4.9.5.3 Fertility Intention and Use of Condom (N=263)

Higher number of participants who reported to use condom, 120 (58.8%), had no plan to have a birth in the future. Equivalent proportion of participants who were using and not using contraceptive were intended to have 1 or 2 children in the future. But there was no report of intending for more than 2 children of respondents who were not using condom; whereas, 22(10.8%) participants who were using condom intended to have more than 2 children in the future. See figure below.

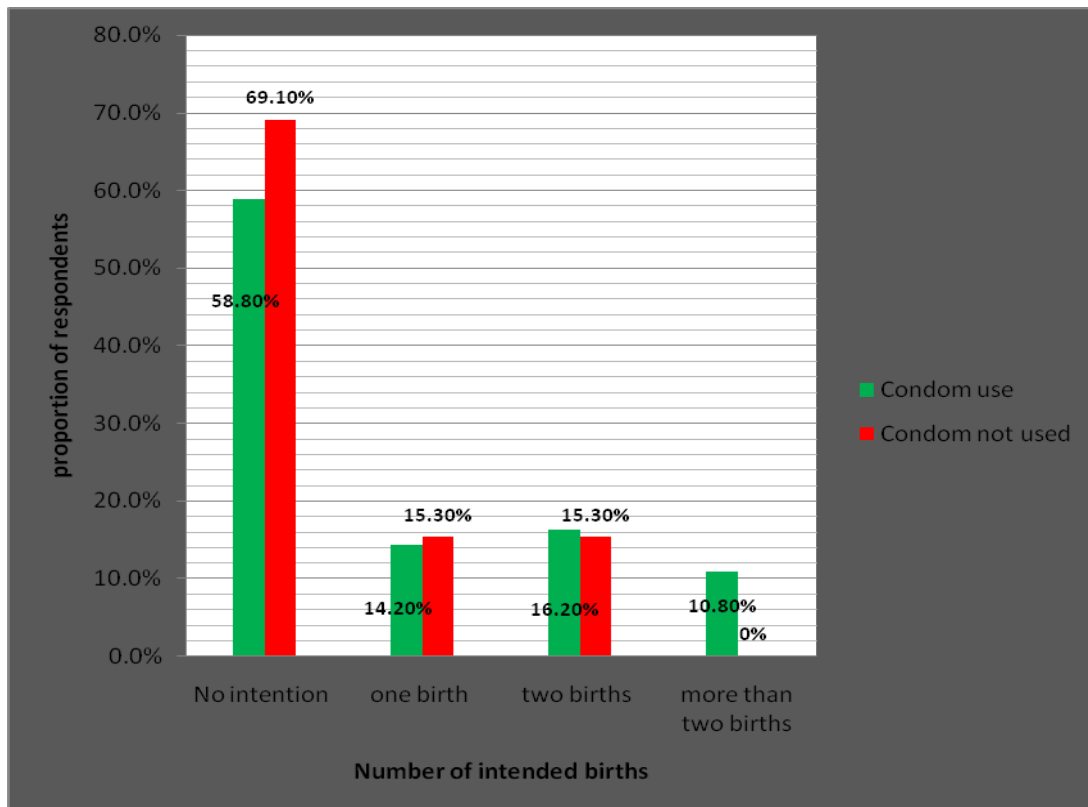


Figure 4.24: A bar graph showing fertility intention and use of condom among the study participants in Hawass Town, 2012

Though condom use is negatively related to fertility intention, the relation is absent at 5% significant level. There is a weak relation at 10% of significant level

Fertility intention has strong and inverse association with participants use of contraceptive. However, fertility intention has no relation with their partner use of FP. Use of condom has a negative and weak relation with fertility intention at significant level of 10%.

4.10 RESEARCH RESULTS: MULTIVARIABLE LOGISTIC REGRESSION ANALYSIS WITH FERTILITY INTENTION

While modelling fertility intention with all variables having relation with fertility intention at p-value of 0.25, and avoiding simultaneous use of total birth, family size and birth after HIV diagnosis as well use of family planning and condom use, six models were constructed. In these models partner fertility desire was found to be consistently associated with fertility intention. In all models where family size, total births and births after HIV diagnosis were involved, each of them were found to be significantly associated with fertility intention. In a model containing use of family planning and birth after HIV diagnosis residential area was also found to be significantly associated with fertility intention. In the six models it was also seen that marital status, religion, age, disclosure of HIV status, and condom use were found to be significant at $p < 0.25$.

Per the purposive model of variable selection the next step of multivariate logistic analysis is to include variables which were found to be not associated with fertility intention during bivariate analysis and excluded in the above fit model. These are gender, ethnic group, monthly income, ART initiation status, duration after HIV diagnosis, duration since ART initiation, health status after ART initiation and births after ART, contraceptive use by partner, births after ART. Partner fertility desire, total births owned and family size were also identified to be a confounding variables in need to be included in a model in this study. Moreover, variables which are potentially acted as a confounders from the previous literature are age, gender, educational status and residential area.

Therefore, age, gender, educational level, residential area, partner fertility desire have to be included in all models as confounders and variables having association with fertility desire. Nevertheless, there were separate models based on family size, total births, and births after HIV diagnosis. Status of ART initiation, ethnic group, monthly income, duration after HIV diagnosis, duration since ART initiation, health status after ART initiation and births after ART, contraceptive use by partner were included in the models one at a time .

After the serial modelling the following variables were still associated with fertility intention; partner fertility desire, family size, total births, births after HIV diagnosis and residential area at 5% significant level. This is a model with preliminary main effect model.

The next procedure is identification of interaction terms and adding them to the preliminary main effect model.

Residential area modifies the association between educational level and fertility intention. Family size was also found to be an effect modifier of the association between residential area and fertility intention. Tables 4.114-4.115 show the summary of identified interaction terms. Interaction with educational level was dropped. The evaluation with likelihood is significant ($P=0.000$) for all interaction model.

TABLE 4.42: SHOWING VARIABLES WITH EFFECT MODIFICATION ANALYSIS

Term	Odds Ratio	95% C.I.	Co-efficient	S. E.	Z-Statistic	P-Value	
Educational level							
High school or more/ Below high school	2.1	0.5863	7.52	0.7419	0.651	1.1397	0.2544
Resident							
Urban/Rural)	<u>3.5064</u>	<u>1.6668</u>	<u>7.38</u>	1.2546	0.3794	3.3065	<u>0.0009</u>
Educational level * Resident	0.6294	0.1652	2.40	-0.463	0.6826	-0.6783	0.4976
CONSTANT	*	*	*	-1.4351	0.3519	-4.0785	<u>0.0000</u>
Convergence:	Converged						
Iterations:	5						
Final-2*Log-Likelihood:	598.8946						
Cases included:	450						
Test	Statistic	D.F.	P-Value				
Score	18.917	3	0.0003				
Likelihood Ratio	20.2275	3	0.0002				

TABLE 4.43: SHOWING VARIABLES WITH EFFECT MODIFICATION ANALYSIS

Term	Odds Ratio	95% C.I.	Coefficient	S.E.	Z-Statistic	P-Value
Family size						
more than 4/1-3	<u>0.2128</u>	<u>0.052</u> <u>0.876</u>	-1.5476	0.72	-2.1435	<u>0.0321</u>
Resident						
Urban/Rural	1.7037	0.472 6.154	0.5328	0.66	0.8131	0.4162
Family size * Resident	1.8456	0.421 8.087	0.6128	0.75	0.8129	0.4162
CONSTANT	*	* *	0.0000	0.63	0.0000	1.000
Convergence:	Converged					
Iterations:	5					
Final -2*Log-Likelihood:	578.368					
Cases included:	450					
						P-
Test	Statistic	D.F.	Value			
Score	38.9332	3	0.00			
Likelihood Ratio	40.754	3	0.00			

Residential area and family size are selected and educational level is dropped based on the effect modification analysis. Moreover, the interaction term, family size*resident, is included in the next model.

In the last model, the preliminary main effect model, variables identified were partner fertility desire, family size, total births, births after HIV diagnosis and residential area to be dealt with the interaction terms. Thus, residential area, family size, total births, births after HIV diagnosis, partner fertility desire, and the interaction term (family size*resident) are included in the last model. Still, three models were created each for family size, total births and births after HIV diagnosis.

TABLE 4.44: PRILIMINARY FINAL MODEL OF FERTILITY INTENTION WITH HOUSEHOLD FAMILY SIZE (FMODEL I)

Term	Odds Ratio	95% C.I.	Co-efficient	S. E.	Z-Statistic	P-Value	
Family size							
More than 4/1-3	0.227	0.0246	2.1015	-1.482	1.1349	0.1917	
Partner fertility desire							
Yes/No	<u>19.11</u>	<u>10.5153</u>	<u>34.725</u>	2.9501	0.3048	<u>0.0000</u>	
Resident							
Urban/Rural	1.214	0.1427	10.321	0.1937	1.0921	0.8592	
Family size * Resident	2.088	0.2016	21.632	0.7364	1.1928	0.537	
CONSTANT	*	*	*	-0.909	1.0572	-0.8594	0.3901
Converged							
Convergence:	ed						
Iterations:	6						
Final-2*Log-Likelihood:	289.8						
Cases included:	322						
Test							
Score	Statistic	D.F.	P-Value				
	139.4	4	0.00				
Likelihood Ratio	154.5	4	0.00				

TABLE 4.45: PRILIMINARY FINAL MODEL OF FERTILITY INTENTION WITH TOTAL BIRTHS (FMODEL II)

Term	Odds Ratio	95% C.I.	Co-efficient	S. E.	Z-Statistic	P-Value	
Partner fertility desire							
Yes/No	<u>19.73</u>	<u>10.814</u>	<u>35.987</u>	2.982	0.3067	<u>0.0000</u>	
Resident							
Urban/Rural	2.008	0.8517	4.7329	0.697	0.4375	0.1112	
Total births							
0-2births/>2 births	<u>2.385</u>	<u>1.3153</u>	<u>4.3238</u>	0.8691	0.3036	<u>0.0042</u>	
CONSTANT	*	*	*	-2.48	0.4407	-5.6272	<u>0.0000</u>
Converged							
Convergence:	Converged						
Iterations:	6						

Final-2*Log-			
Likelihood:	284.4		
Cases included:	321		
			P-
Test	Statistic	D.F.	Value
Score	142.3	3	0
Likelihood Ratio	158.4	3	0

TABLE 4.46: PRILIMINARY FINAL MODEL OF FERTILTIY INTENTION WITH BIRTH AFTER HIV DIAGNOSIS (FMODELIII)

Term	Odds Ratio	95% C.I.	Coefficient	S. E.	Z-Statistic	P-Value
BAFTERHIVDX						
Yes/No	<u>0.521</u>	<u>0.2776</u>	<u>0.9779</u>	-0.652	0.3213	-2.0294
Partner fertility desire						
Yes/No	<u>23.29</u>	<u>12.6869</u>	<u>42.762</u>	3.1481	0.31	10.156
Resident						
Urban/Rural	<u>2.387</u>	<u>1.0386</u>	<u>5.4854</u>	0.87	0.4246	2.0491
CONSTANT	*	*	*	-2.012	0.4212	-4.7775
Convergence:	Converged					
Iterations:	6					
Final -2*Log-						
Likelihood:	288.3					
Cases included:	321					
						P-
Test	Statistic	D.F.	Value			
Score	139.8	3	0			
Likelihood Ratio	154.4	3	0			

4.10.1 Summary of the Multivariable analysis of fertility intention

As seen in the three models above (FMODEL-I-III), partner fertility desire was persistently associated with fertility intention. In the isolated models involving family size in the household, overall births owned and births after HIV diagnosis; total births experienced and birth experience after HIV diagnosis were found to be associated with fertility intention. Though residential area

was significantly associated with fertility intention in the last model, it has to be noted that residential area was confounded by the overall births which absent in the last model. Moreover, its association needs to be considered in the model with interaction term, resident*family size. Thus, in the model involving total birth and the interaction term, residential area is not significantly associated with fertility intention at 5% level of significance (See FMODEL I & FMODEL II). Thus, partner fertility desire, overall births, and births after HIV diagnosis were the stronger predictors of fertility intention.

Controlled for potential confounders, overall birth was found to be strongly associated with fertility intention (Adjusted odds ratio(AOR): 2.4 95% CI 1.32-4.32; p-value=0.0042). Study participants who reported to have 2 birth or less were 2.4 times more likely to intend for another child in the future as compared to those respondents who reported to have more than 2 births during the study period.

It was also found in the serial logistic analysis that study participants who responded to have a birth experience after HIV diagnosis were 48% less likely to intend for a child in the future (Adjusted odds ratio (AOR):0.52 95% CI 0.28-0.98; p-value=0.0424). Thus, having at least a birth after one is aware of his/her HIV status is a determinant factor not to intend for a child in the future.

Adjusted for possible confounders partner fertility desire is also found to be strongly associated with fertility intention (AOR: 19.73 95%CI 10.81-35.99; p-value=0.0000). In other words, respondents who responded that their partner also desired for childbearing are more likely to plan for at least one child as compared to those respondents who did report that their partner had no will for childbearing.

The table below is summarizing factors associated with fertility intention during bivariate analysis. It also demonstrated those variables who remained to be still significantly associated with fertility intention after a serial of multivariable logistic analysis using the purposive variable selection method.

TABLE 4.47: UNADJUSTED AND ADJUSTED ODDS RATIOS WITH FERTILITY INTENTION VS NO FERTILITY INTENTION IN HAWASSA CITY, 2012.

Variables	Categories	Bivariate			Multivariable		
		OR (95%CI)	Co-efficient	p-value	AOR (95%CI)	co-efficient	p-value
Age		0.93 (0.9-0.96)	-0.07	0.0000	0.96(0.91-1.02)	-0.04	0.1997
Religious affiliation							
	Muslim/Catholic and others	5.54(1.47-20.86.08)	1.71	0.0113	1.42(0.14-14.42)	0.35	0.768
	Orthodox/Catholic and Others	3.52(1.16-10.72)	1.26	0.0267	0.70(0.10-5.0)	-0.3614	0.7187
	Protestant/Catholic and Others	4.60(1.51-14.03)	1.53	0.0072	1.56(0.23-10.62)	0.44	0.6513
Marital/relationship status							
	Never married single/Married	2.85 (1.27-6.430)	1.05	0.0114	0.00(0->1.0E12)	-13.21	0.9766
	Widowed/Married	0.31(0.15-0.63)	-1.19	0.0014	N/A	N/A	N/A
	Non-married partner/Married	6.12 (1.31-28.37)	1.81	0.021	0.91(0.11-7.57)	-0.09	0.9322
	Divorced/Married	0.9965(0.54-1.82)	-0.0035	0.991	0.00(0.00->1.0E12)	-14.34	0.9746
Educational level							
	High school and above/Below high school	1.56(1.07-2.27)	0.44	0.0209	0.83(0.46-1.90)	-0.07	0.8359
Occupation							
	Employed/Daily labourer	1.00 (0.54-1.86)	0.0074	0.9812	0.84(0.27-2.60)	-0.18	0.7600
	Housewife/daily labourer	0.43(0.21-0.88)	-0.85	0.0204	0.59(0.20-1.80))	-0.5212	0.3584
	Merchant/Daily labourer	1.33(0.68-2.58)	0.28	0.4033	0.68(0.23-2.03)	-0.39	0.4889
	Unemployed/Daily laborer	0.85(0.43-1.7)	-0.16	0.6508	0.84(0.24-3.00)	-0.1733	0.7881
Resident							
	Urban/Rural	3.31(1.80-6.08)	1.2	0.0001	2.01(0.85-4.73)	0.7	0.1112
Household family size							
	More than 3/1-3	0.34 (0.23-0.51)	-1.09	0.0000	0.23 (0.25-0.2.10)	-1.48	0.1917
Total births							
	0-2 births/>2births	3.56 (2.38-5.33)	1.27	0.0000	2.39(1.32-14.32)	0.87	<u>0.0042</u>
Birth after HIV diagnosis							
	Yes/No	0.68(0.45-1.04)	-0.38	0.077	0.52 (0.28-0.98)	-0.65	<u>0.0424</u>
Duration in relationship with partner							
	>=11 years/1-10 years	0.41 (0.26-0.66)	-0.88	0.0002	0.94(0.45-1.95)	-0.06	0.8663
Disclosed HIV status to partner							
	Yes/No	0.18(0.04-0.85)	-1.71	0.0305	2.27(0.76-6.78)	0.82	0.141
Partner fertility desire							
	Yes/No or unknown	22.31(12.41-40.10)	3.1	0.0000	19.73(10.81-35.99)	2.99	<u>0.0000</u>
Use of Contraceptive							
	Yes/No	0.67(0.46-0.97)	-0.4	0.0339	0.64 (0.26-1.61)	-0.45	0.34
Use of condom							
	Yes/No	1.60(0.86-2.97)	0.47	0.1405	1.94(0.66--5.7)	0.66	0.2283

4.11 THE REPORTED REASONS OF STUDY PARTICIPANTS' TO DESIRE AND NOT TO DESIRE FOR FUTURE CHILDBEARING

4.11.1 The Reported Reasons of PLHIV to have a/nother Child/ren

The most commonly reported reasons of wishing for future childbearing were: ART can enable to have HIV free child (21.8%), childless before (21.3%), importance of parenthood (17.8%), and the desire of a partner for child (16.8%). The unavailability of contraception (0.5%) and the death of a child (1%) were the least reasons mentioned. The regain of health (6.9%), the need for more child/ren (5.4%), fear of childless stigma (4%) and others (4.5%) were the other whys reported for the need to have a child in the future. See the table below. It can be seen therefore that the commonly mentioned reasons for having a child were medical, social and cultural.

TABLE 4.48: THE FREQUENCY OF THE REPORTED REASONS FOR DESIRING A/OTHER CHILD/REN

Why you desire to have a/nother child/ren?	Number in Male	Number in Female	Total Number(percent)
1. No child before	22	21	43(21.3)
2. fear of childless stigma	4	4	8(4.0)
3. importance of being a parent	17	19	36(17.8)
4. No available contraceptive	1	0	1(0.5)
5. desire of my partner	18	16	34(16.8)
6. I am healthy to give birth	8	6	14(6.9)
7. ART enable to have HIV negative child	26	18	44(21.8)
8. Need more child/ren	0	11	11(5.4)
9. My child/ren died	1	1	2(1.0))
10. others	8	1	9(4.5)
Total	105(51.98)	97(48.02)	202(100)

4.11.2 The reported reasons of study participants not to have a/nother child/ren

Having enough children (47.4%) is the most common reported reason for the failure to desire for future birth. This is followed by inadequate income (27%), not to worsen their health (15.4%) and fear of vertical transmission of HIV (6.3%). The advise by health professional (1.2%) not to have a HIV positive child and because the partner did not need it (2%) were other reasons for not having a desire for future childbearing.

TABLE 4.49: FREQUENCY OF THE REPORTED REASONS NOT TO DESIRE FOR A/NOTHER CHILD/REN, HAWASSA 2012

Why don't you desire to have a/nother child/ren?	Female Number	Male Number	Total Number
1. Fear of MTCT	5	11	16(6.3)
2. Enough Children	61	59	120(47.4)
3. Partner does not need children	0	2	2(0.8)
4. In adequate income	37	31	68(26.9)
5. Not to worsen my illness	22	17	39(15.4)
6. I have been advised by a professional	2	1	3(1.2)
7. I don't want to have an HIV positive child	4	1	5(2.0)
Total	131(51.78)	122(48.22)	253(100)

4.12 ACTIONS TAKEN BY STUDY PARTICIPANTS TO HAVE AND TO AVOID PREGNANCY

Nearly 98% (199/202) of the respondents who desired to have a child had taken an action to have a child. Moreover, all of those participants who responded for fertility intention (199) also reflected for the actions taken to have a child. Close to 34% reported to have consulted HCW, 27.6% had either already approached their partner or their partner had approached them; 17.6% were planning to get married or have a partner. A few of them, 12/199 (6%), had already stopped using contraceptive to get pregnant. See table below.

TABLE 4.50: ACTIONS TAKEN BY THE STUDY PARTICIPANTS TO HAVE A CHILD

What did you do to have child?	Female	Male	Total (%)
1. Approached my partner.	13	23	36(18.1)
2. My partner has already approached me.	8	11	19(9.5)
3. I have consulted Health care worker	34	34	68(34.2)
4. I have stopped using a contraceptive	7	5	12(6.0)
5. I am currently pregnant or my partner is pregnant	8	5	13(6.5)
6. Tried to get married or have a partner	16	19	35(17.6)
7. Other	11	5	16(8.0)
Total	97	102	199(100)

It can also be noted from the above table that there were 13 (6.5%) pregnancies reported by the male study participants (of their partners) or by female participants (themselves) during the data collection among those who responded for the action taken to get pregnant. It can also be computed that 6 of them desire to have another pregnancy in the future though they or their partner were pregnant during the data collection period. The rest 7 did not desire to have a child in the future.

All participants who did not intend to have a child (248) had taken action. One hundred fifty-three (61.4%) of the participants responded that they or their partners were using contraceptive not to get pregnant. Around 33 % of them were either not using contraceptive and yet try to avoid pregnancy, reported a plan to use contraceptive after marriage, abstaining or they reported not to marry or have a partner again. See table below.

TABLE 4.51: ACTIONS TAKEN BY THE STUDY PARTICIPANTS TO AVOID PREGNANCY

What did you do not to have a child?	Female	Male	Total (%)
1.I am a using a contraceptive	56	79	135(54.21)
2.My partner is using contraceptive	4	14	18(7.23)
3.Not using contraceptive but try not to get pregnant	16	2	18(7.23)
4.After marriage will use contraceptive	1	0	1(0.40)
5.Abstaining	33	21	54(21.69)
6.I don't want to marry or have a partner	10	0	10(4.0)
7.other	9	4	13(5.22)
Total	129	120	249(100)

4.13 OVERVIEW OF RESEARCH FINDINGS

This is a cross-sectional study carried out among PLHIV attending ART clinic of three facilities at Hawassa city from June 2012-August 2013. A total of 460 PLHIV had participated in the fertility desire and intention study. Equal males and females were involved. The median age of the study participants was 33 years ranging within a child-rearing age, 17-54 years. Sidama (23.3%) and Amahara (23.56%) were the dominant ethnic group participated. The majority of the participants were from urban (85%) and in relationship (70.9%). The two dominant religion affiliations reported in the study were Orthodox (47.0%) and Protestants (43%). The rural participants were mainly protestants (34/69, 49.3%) where as the urban were Orthodox (195/391, 50%). There were higher proportion of reported widowed (75.5%, 40), non-married Couples (91.7%, 11) and separated (66%, 33) female participants as compared to the males. About 11% of the respondents were unable to write and read. The majority of participants who reported to attend at least high school educational were the male from urban (110, 90.2%). Nearly 34 % of the participants had already been employed and 20.3% were merchants.

Close to 35% (135) of urban residents and 16 % (11) of rural had already been employed. About 53% of the participants reported \$56 as their monthly income. As anticipated, more males (30.4%, 70) reported to have an estimated monthly income of \$56 or more as compared the females (14.9%, 34).

The reported average household family size was four. This average is higher for rural (5.7) as compared to the urban (4.2). More than half of the participants (51.3%) reported to have 4-7 family size. Near to 72% of the respondents reported to have at least 2 births and the mean overall birth is 2.8. Older participants from rural and in relationship had already more children.

Nearly 160 births were after HIV diagnosis and half of these were after ART initiation. However, only 29.5% of the participants said to experience birth after they were aware of their HIV status whereas only 17% of them reported to have birth after they started ART. HIV +ve concordant couples on ART for more than a year reported to have an aggregate of at least 3 children.

The median duration after HIV diagnosis was 48 months in urban and 36 months in rural. The majority of the study participants (80%) had already been put on ART during the study period. The median duration after ART initiation was 33 months. During data collection 94 % of the study participants reported to feel better after ART.

The mean time in relationship was 11 years (males: 11.75yrs; females: 9.8yrs). About 60% had already lived together for 1-10 years. They reported an encouraging disclosure (96.4%) of once HIV status to a partner. Near to 93% of them also reported that their partner had already been tested. About 94% of them had already known the HIV status of their partner where 72.3% of them were HIV positive concordance and 21.3% were HIV negative discordant couples. Participants who had already been on ART for more than a year (89.2%) had already disclosed their HIV status to their partner. Close to 41.5% of them reported that their partner had also a desire to have a child in a future.

More than half of (54%) of the participants said they were using at least one of the modern contraceptive. Condom use alone (67%) and in combination with hormonal contraceptive (10.7%) were the highly reported contraceptive being used. Nearly 70% of the participants having a birth after HIV diagnosis were using FP. Close to 85% (107) male respondents who were using contraceptive reported that their partner were also using one of the modern FP as

compared to the 76(73.1%) of the females. Well educated male in longer relationship with their partner were reported to be more likely to use condom. The use of long term FP was reported to be 12.7%.Unmet need of FP was computed to be 32.4%%.

A total of 460 and 450 participants had responded for questions addressing fertility desire and fertility intention respectively. Close to 98% of respondents who answered for the question of fertility desire (460) had also responded for the question of fertility intention (450). There was 99% (200) concordance for the desire and intention for future childbearing. There was also 99.2 %(244) concordance for not desiring and not intending for future fertility. Only two participants reported to desire fertility but fail to intend, making 0.8% discordant result. The desire and intention for future fertility was reported by equal number of respondents, 202. This makes the prevalence of fertility desire and fertility intention of 43.9% (202/460) and 44.9 % (202/450) in this study respectively.

Bivariate analysis has shown that age, religion, marital relationship, highest educational level, occupation, place of resident, household family size are socio-demographic characteristics found to be associated with both fertility desire and fertility intention at 5% significant level. On the contrary, statistical significance was not appreciated with gender, ethnic group and monthly income. Total birth owned is associated with both fertility desire and fertility intention while birth after HIV diagnosis is associated only with fertility desire at 5% of significant level. All variables of HIV/ART history and number of birth after ART initiation computed to have no association with both the outcome variables. Both fertility desire and fertility intention relate with duration in relationship, disclosure of HIV status to partner and partner fertility desire but no association was noted with knowledge of partner HIV status at $p < 0.05$ significant level. With the exception of use of a family planning, other variables of history of family planning are not related to both fertility desire and fertility intention at significance level of 5%. At significant level of 0.25 it was found that knowledge of partner HIV status and condom use are associated with both outcome variables. Birth experience after HIV diagnosis is associated with fertility intention only at $p < 0.25$.

Nevertheless, multivariable logistic regression has left only with reported total births, birth experience after HIV diagnosis and partner fertility desire as strong predictors of fertility desire and fertility intention at $p < 0.05$. Family size in household is also one of the determinate factor for fertility desire but not for fertility intention at $p < 0.05$.It was also found that household family

size, total birth owned and partner fertility desire are confounding the relationship between some dependent variables and fertility desire and fertility intention.

Believing that ART enables to have HIV free child (21.8%) and the regain of health (6.9%) were the medical reasons mentioned for desiring a child in the future. Social reasons exemplified by importance of parenthood (17.8%), and the fertility desire of a partner (16.8%), and cultural issues such as childless before (21.3%) or fear of childless stigma (4%) were also other reasons mentioned for future child willing. To fulfil their aim of getting child/ren in the future the study participants had already discussed with their partners (27.6%) and with HCWs (34.2%).

For those who fail to respond to desire for future fertility desire; having enough children (47.4%), having insufficient income (27%) and the fear of worsening of their health condition (15.4%) were the common reasons cited not to desire and intend for future birth. Therefore, to avoid pregnancy the study participants (54.21%, 135) or their partners (7.23%, 18) reported to use one of the contraceptives. During the study period it was also mentioned that non-use of contraceptive; in the form of abstaining (21.7%), trying to avoid pregnancy but not using contraceptive(7.23%), trial to avoid having partner (4%) and plan to use family planning after marriage(0.4%) were the action being practised to prevent pregnancy.

4.14 CONCLUSION

The findings of fertility desire and intention study indicates that 99% of those who desire for fertility (43.9%) also reported to plan for at least one child in the future (44.9%).The researchers also found out that having fewer than four family size in household or an experience of less than three overall births thus far, and no experience of birth after HIV diagnosis and fertility desire by a partner are traits which result in the development of a positive childbearing motivation (PCM). The developed PCM in turn attributes childbearing desire and childbearing intention. On the other hand, the traits; of having more than 4 family size or at least 3 overall births, an experience of a birth after HIV diagnosis and lack of childbearing desire by the partner create the negative childbearing motivation (NCM). This NCM again leads to the failure to desire and intend for future childbearing.

It was also shown that, having no enough living children, believing that ART enabled to have HIV-ve child as PMTCT, importance of parenthood and partners' desire for childbearing are

strong motivation for child bearing. However, having enough children, inadequate income, fear of the recurrence of illness and fear of MTCT are a weak motivation for future childbirth.

Besides, the findings indicate that those participants with PCM and thus with future childbearing will and fertility plan reported consulting health care workers (HCWs), discussing with a partner, trying to get married or have a partner and quitting use of contraceptive as actions or behaviour to get pregnant in the future. On the contrary, participants with NCM and thus failed to desire and intend for future fertility reported use of family planning and abstaining as actions or behaviour not to get pregnant in the future. Thus, household family size, total children owned, birth experience after HIV diagnosis and partner fertility desire are traits which motivated participants negatively or positively for childbearing leading to fertility desire and intention. This is followed by the behaviour developed or action taken for the developed desire and intention.

Therefore, the theoretical framework of TDIB fully describes and explains the fertility desire and intention study. However, the timing of fertility desire and intention (when to get pregnant) and the childbearing/pregnancy event parts of the TDIB are not included in this research. This is partially due to the fact that this study is a cross-sectional study so that one can't appreciate the pregnancy event. Thus, longitudinal study might be designed to really see the time and event of childbearing. Eventually, the interpretation of these findings, as part of conclusion and recommendation, will be a key role of the next chapter.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

Babie (2008: 443) states that research findings need to be translated from research language to the language of statistic. When the statistical analysis is finalized, the research should be back translated to research language. According to Babie (2008:443) this is a process of translation and interpretation which can be carried out sequentially as seen in figure 5.1. In this chapter, this translation and interpretation process is preceded by the summary of the findings. Then, the recommendation, contribution of the study, and the limitation is presented. With the concluding remark the study comes to the wrap-up.

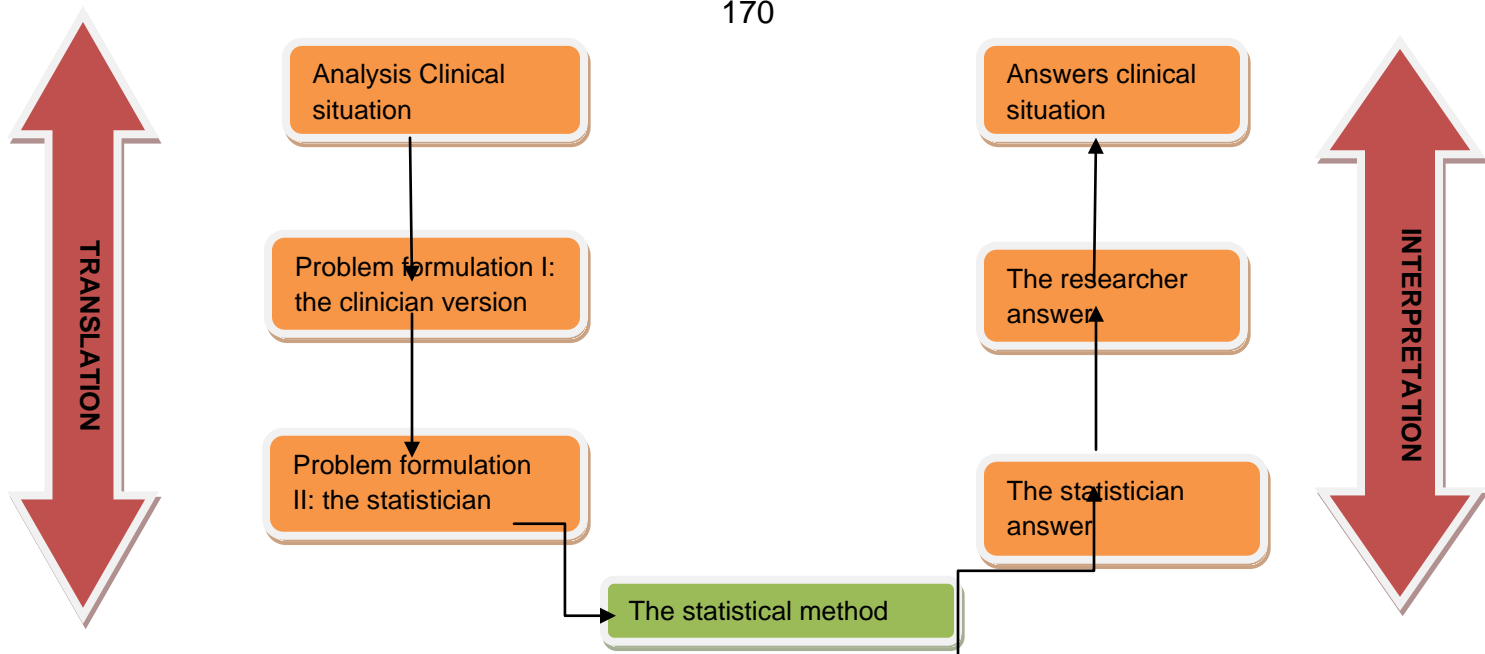


Figure 5.1: A diagram showing translation and interpretation process of a research (Adapted from Babie (2008:443)).

5.2 RESEARCH DESIGN AND METHOD

This is a quantitative and cross-section study design guided by the TDIB theoretical framework. It uses probability sampling method; stratified and random sampling. The data is collected by pre-tested and structured questionnaires with close-ended questions. The approach is a structured interview where every client is approached after a formal consent form is obtained. These all is done to determine the prevalence of fertility desire and fertility intention and associated factors among male and female PLHIV seeking chronic HIV care at health facilities in Hawassa city.

5.3 SUMMARY AND INTERPRETATION OF THE RESEARCH FINDINGS

The respective 56.1% and 55.1% of participants failed to desire and intend for future childbearing. Failure to wish and plan for future pregnancy is reported more likely in those respondents whose partner also reported to be not to desire for future fertility. Similarly, these are also participants' with relatively higher family size or total births as well as those who had already experienced at least a birth after HIV diagnosis. The study participants also reported that having enough children, inadequate income, and fear of MTCT and exacerbation of the sickness are some of the reasons for not desiring and intending for future childbearing.

Therefore, they have to use family planning or their partners have to use contraceptive, or they have to abstain to avoid future pregnancy.

In other words, 43.9% and 44.9% of the participants desired and intended for future fertility respectively. These respondents were those with fewer than four family sizes or less than three total births. Those who wished and planned to have a birth in the future were also those who had never experienced a birth after the diagnosis of HIV and they were those whose partners reported to desire for fertility. They wished and planned to get birth because; they did not have a/children before or fear of childless stigma, ART could help MTCT, importance of parenthood and the desire of once partner. The study participants reported that they had to consult health care workers, approach their partner or their partner had already approached them, try to get a partner or married and stop using family planning to get pregnant.

5.4 FERTILITY DESIRE AND INTENTION

The 44% reported fertility desire in this study is lower than the general population where a 69% of men and 57% of women want to have another child (Central Statistical Agency [Ethiopia] and ICF International. 2012:81-83). In fact this comparison is crude, since PLHIV differs from male and females in the general population on a number of demographic characteristics.

This fertility desire in this study is higher than the 37.1% of the Tanzania (Mmbaga et al 2013:86). The proportion of fertility desire reported by Tesfaye et al (2012:20) is lower as compared to our study; a fertility desire of 49.71% in males and 36.3% in females. This high fertility desire during the verge of ART and PMTCT expansion in Ethiopia has got SRH implication where the high need of childbearing among PLHIV needs to be addressed at chronic HIV clinic. This brings a concern for the patients because of the possible unprotected sexual practice. This could lead to horizontal transmission of new or resistance strain of HIV virus to positive or negative partner. There is also fear of vertical HIV transmission if the fertility desire is resulted in pregnancy. Orphaning is another threat. Therefore, HCWs should plan ahead to deal with the fertility desire of PLHIV to counsel on the possible vertical and horizontal HIV transmission and thus offer the option of ART and PMTCT to reduce viral load (UNAIDS 2012).

The high fertility desire is also corroborated with studies conducted in similar setting among PLHIV on chronic HIV care in Nigeria (Oladapo et al 2005), Uganda (Kaida et al 2013:e63411), Tanzania (Mmbaga et al 2013:1) and other researches in Ethiopia (Negash et al 2012:1; Tesfaye et al 2012:20). The availability of therapy and the improvement in the quality of life may be associated with the PLHIV's desire to have a child. In Ethiopia, AIDS prevention and control is a priority of Federal Ministry of Health (FMOH) and PLHIV have free access to HAART and PMTCT which may explain our findings.

Still the fertility desire is lower than the fertility desire reported in developed nations: USA (Finocchiaro-Kessler et al 2010:1156), Canada (Loutfy et al 2009:1), Denmark (Laursen et al 2013:e851) and UK (Cliffe 2011:1093). This is because developed nations have already lower fertility rate. Most of these studies in developed nations were also done after they had expanded ART and PMTCT services where their fertility desire is higher. However, the findings from Nigeria (Oladapo 2005: 1672) had even found higher fertility desire and intention as compared to this study. These days the number of pregnancies among PLHIV is increasing being a proxy indicator of increasing fertility desire during the advancement in ART implementation of ART (Berehan and Berhan 2013:6). These all show that there is inconsistency in fertility behavior of PLHIV in need of further investigation.

The 44% fertility desire among PLHIV in Ethiopia, a country with high unmet need of reproductive need, is high and it is a public health interest. So, HCWs at ART clinic should support PLHIV with fertility desire, options of getting pregnancy like having sexual intercourse during high risk pregnancy period or ovulation and practicing safer sex, using condom during the other period has to be well advice to PLHIV. This is because other assisted conception services among PLHIV are not available in Ethiopia.

Failure to desire for fertility (56.1%) is higher than the 37% in the general population in Ethiopia (Central Statistical Agency 2012:81). This might be due to the fact that this is the institute based study at a chronic HIV/ART clinic where PLHIV can receive counselling on safer sex, family planning and etc. This has got an important impact on safer SRH knowledge and practice among the study participants.

This could also explain the high condom use (77.7%) and lower estimate of intended birth, a median of 2.

On the other hand, proportion of PLHIV responded to limit children, not to desire (56%) and not to intend (55%), is lower than the respective figures of 73% and 83% in the study of Dube et al (2012:1). The study of the Dube and his colloquies was carried out among the monogamous couples who had already enough children. The information of PLHIV to limit childbirth tells the need to give focus to assist them on ways of preventing pregnancy. Studies done in Europe (Nostliger et al 2013:1), South Africa (Cooper et al 2009:s38), Papuaguinea (Asaka 2011:198), Uganda (kaida et 2013:e63411) and others in Ethiopia (Negash et al 2012:1) have reported similar finding. Most of these studies are facility based studies done in similar settings to this study. Therefore, HCWs working at chronic HIV clinic has to consider rendering options of contraceptives for PLHIV who wants to limit childbearing.

Among those desiring children, only 1% did not intend to bear any children in the future as compared to the 4.3% of study in Nigeria (Olufemi et al 2005:4). An aggregate of 45 % participants reported they intended to have a child during the data collection period. The study in urban women living with HIV in USA by Finocchario-Kessler et al (2010:1106) revealed that the fertility intention is 66% which is higher than the 43.4 % among women in this study.

The overall median number of children planned by study participants was 2 which is lower than the 4.8 children per woman's in general population (Central Statistical Agency [Ethiopia] and ICF International. 2012:6-819). This could be explained by the fact that PLHIV face with psychological and medical reasons which could lower fertility desire than the general population (Cooper 2009:350; Kaida et al 2009:38). Besides, the 23.9% (63) fertility intention of the females and the 30.4% (68) of the the men intended to have 2 or more than 2 children is lower than the findings reported by Oladepo et al (2005:5) in Nigerial where 71.5% and 93.8% of the men and women were intending for at least for 2 children respectively. However, it is similar to the 2.4 intended births in Tanzania (Mmbaga et al 2009:85).

Moreover, the finding from the studies done in different setting; developed nation (Loutfy et al 2009) and the capital of Ethiopia (Negash et al 2013: 1) was higher than this study regarding the fertility intention. These are the settings where total fertility rate

is lower and the females are well educated to practice their own fertility decision making.

PLHIV in the study wanted to limit children mainly because they had already enough children (47.7%) and had inadequate income (27%). These reasons are non-HIV related. However, fear of having HIV infected child (6.3%) and not to worsen their health (15.4%) were also mentioned. Keogh et al (2012:39) identified HIV-related health concerns and nurse's discussion as major factors discouraging childbearing post-HIV diagnosis. The qualitative study in Cape Town of South Africa by Cooper et al (2005:1) mentioned also that fear of having an infected child and fear of being unable to financially support child as reasons not to have a child in the future. Fear of premature death, financial and perinatal HIV transmission were reported also to be the reasons for participants' desire to delay or cease child bearing in Kenyan in-depth interview study (Elizabeth Harrington 2012:1-8). The fear of infecting a new partner (31%) or the child (23%) as well as deterioration of their own health (25%) were also the reason mentioned in the study of Aska et al (2011:202-204) for not having a child.

Our study was carried out in the period where ART/PMTCT service has given PLHIV the confidence of having HIV free child. A lot of intervention had also been taken place during the study period which might increase the awareness of PLHIV regarding benefits of ART/PMTCT remarkably reducing HIV transmission. That could be the reason why the commonly mentioned reason by the study participants were non-HIV related. This might indicate that the reasons among the general population also work for PLHIV during the late HIV epidemic as indicated in the meta-analysis of Berhan and Berhan (2013:6). Therefore, there are groups of population who need special attention to prevent both further transmission of HIV; the 20% of discordant couples and those with high unmet need of family planning (32%). In the form of "One stop-shopping" strategy all options of contraceptive have to be available to these groups of population.

5.4.1 Fertility Desire, Intention and Age of PLHIV

The younger PLHIV have shown the higher fertility desire and intention. The finding is similar to most other studies both in developed (Laursen et al 2013:e851; Nostlinger et al 2013:251) and developing

(Getachew et al 2010:217; Heys et al 2009:S3; Kawale et al 2014: 769; Oladapo et al 2005:1) countries. In Ethiopia they are these groups of population which are highly affected by HIV (USAID/EDHS 2011). It means that their higher fertility desire has to be taken into consideration as part of a comprehensive SRH. It is the limitation of this research not to see the special need of SRH of adolescent which is critical to look into for their need regarding SRH is somehow different from the older PLHIV (Laurson et al 2013: e851) warranting special strategy.

5.4.2 Fertility Desire, Intention and Gender

In this research, higher proportion of male PLHIV desire and intend childbearing than the females. The reported fertility desire of the males (51.5%) and the partners of females (46.5%) are higher than that of the females (48.8%) and the partners of males (37.5%). Close to 24% of female and 30% of men intend to have at least two children. This is more significant among the rural females not to desire (75%) and not to intend (78.6%) for childbearing. This might be due to the higher number of births rural mother already had; 15(55.6%) of them had at least 4 children as compared to only 47(23.9%) of the urban females with 4 or more children (Chi-square:14.78, p-value=0.0052). In addition, 11(50%) and 8(36.4%) of the rural female said that they did have enough children and insufficient income as a reasons not to have a future desire for birth respectively.

Though high proportion of female respondents (56.5%) seem to respond not to desire for a child in the future as compared to their male counterparts (53.5%), there is no evidence that there is statistical association between fertility desire and sex of the study respondents (Odds ratio (OR): 1.11, 95% CI 0.77-1.61, p-value=0.57). In fact, the proportion is higher than the 2011 EDHS report where 29% of men without a desire to have a child is lower than the 37% of the women who want no more children (Central Statistical Agency [Ethiopia] and ICF International. 2012:83). It can also be computed that fertility desire of the partners of males (37.5%) desire less than the partner of females (46.5%). This is in contrary to study in Addis Ababa among HIV positive males and females which have shown that only 76 (35.2%) males showed a desire to have a child as compared to 109 (44.7%) of the female participants (Tamene and Fantahun 2007:224).

Male gender, which was not reported in this study, is associated with fertility desire and intention in different studies from developed and developing countries. Alemayehu and Aregay (2012:130) & Getachew et al (2010:217) from Ethiopia show a lower proportion of fertility desire among males as compared to the females. Sherr in his review (2010:1) also indicates that male desires for a child are greater than those of their female partners. It is also shown in Uganda study that female sex is one of the independent predictor of to stop childbearing (Heys et al 2009:S3). All show that females PLHIV desire fertility less likely as compared to the males including the study by Myer et al (2007:278).

However, study in Switzerland among HIV+ve people have revealed a different finding; 47.5% of female and 38% of males were found to desire for future childbearing (Panozsoa et al 2003:124). A survey done in UK among HIV infected women has found that 336 (75%) of the participants wanted more children (Cliffe S, Townsend CL, Cortina-Borja M & Newell ML 2011:1093). This is higher than the 42.6% of this study. Besides, being female gender is associated with fertility desire in the study from Denmark (Laursen et al 2013: e851).

These differences might be due to the difference in the culture, educational status and socio-demographic factors. SSA is a male dominated society and culture where males desire to leave their 'name' and lineage behind when they die. Whereas in the developed countries females are educated which enable them to be responsible for their own childbearing decision making.

In this study male are not only with higher fertility desire but also they are the one who influence females as a partner for fertility decision. That is why in the study 22% (21) of the female PLHIV had their male partner approached them for future fertility.

Both providers and policy makers alluded to the difficulties associated with including men in reproductive health care services including fertility-related counseling and contraception. This is evidenced by Harries et al (2007:282) who have pointed out that more general reproductive matters were viewed by men as part of a "woman's responsibility". The authors also described that a public health policy maker feel that reproductive health services are not "gender sensitive", as they focus more on women's needs.

Therefore, couple counselling and partner HIV testing during ANC, family planning service at chronic HIV care should be encouraged. Above all, male partner involvement in family

planning, SRH, STI or HIV counselling sounds critical. Hence, male involvement is paramount for the success of HIV/AIDS prevention and for the implementation of reproductive health. More emphasis thus must be placed on men understanding their strategic position in HIV prevention effort both using active community information and using targeted information to sero-discordant couples.

5.4.3 Fertility Decision Making and Partner

In the current study, partners fertility desire, as perceived by their spouse, is the strongest predictor with odds ratio of 19.73 (95% CI 10.81-35.99; p-value=0.0000). Other studies have also pointed out that partner fertility desire is an independent predictor of participants' fertility decision in Ethiopia (Getachew et al (2010:216-17) and Papauguine (Aska et al 2011:198).

The fact that partner fertility desire is stronger predictor of fertility desire and fertility intention could also be well exemplified for 16.8% of participants reported that it was due to the desire of their partner that they also wanted to have childbearing. The respondents also said that they have approached (18.1%) their partner to plan for pregnancy. The disclosure of their HIV status is also high (94.6%). Thus, effect of partner on fertility desire and intention is paramount. This could be a sound opportunity for couple based and partner focused SRH service.

The strong role of perceived partner desire for childbearing is found in the context of narrow discrepancy between fertility desire (44%) and fertility intention (45%). This may emphasize the need for universal reproductive counselling to assist PLHIV their reproductive decision and facilitate safe pregnancies and healthy children. The researchers recommend the preparation of partner-involved counselling protocol prepared and used at chronic HIV clinic in Ethiopia. The protocol can be adapted to local scenario from the World Health Organization partner counselling guideline (WHO 2006).

Knowing once partners fertility desire may influence PLHIV in their desire to have children. However, there is a concern of discussion and communication between couples in this study where only 27.6% (55) of the participants reported to either approached their partner or had been approached by their partner. This finding is similar to other studies by Finocchari-Kessler et al (2014:254), Kawele et al (2014:769), and Beyeza-Kashesya et al (2010:247) who have also reported communication of PLHIV with their partner is minimal. This is lower than the

study in South Africa (Schwartz et al 2011:1) where 41% of women had communication with health providers about future pregnancy options. This might show that there is a high non-verbal communication in HIV+ couples where just being aware of one partner's desire to have a child might influence the other without proper verbal communication. In fact, this supports the framework of fertility motivation by Miller (1994) which shows that a partner in a couple is able to perceive their partner's fertility desire through non-verbal. However, there is a possibility that partner's desire might be overestimated. In any cases informed reproductive decision should be prioritized.

Therefore, not only male partner focused couple counselling is essential in the integrated HIV clinic, but HCWs has to also play their part. However, only 34% of the study participants (35.1% of females and 33.3% of males) had consulted HCWs to get pregnancy in this study. This finding is similar to the study in Malawi (Kawale et al 2014: 769) where 24% of the respondents reported having discussion with health care provider about childbearing. In contrary, Finocchiaro-Kessler et al (2010:317) in USA has reported that 67% reported a general discussion about pregnancy and HIV while 31% reported a personalized discussion about future childbearing plans with their provider. Of the personalized discussions, 64% were patient initiated which is much higher than this study. Firstly, this means that a significant proportion of HIV-infected women want to talk about reproductive plans with their HIV provider; however, many have no (Finocchiaro-Kessler et al 2010:317). There is a possibility of unmet reproductive counseling need which need to be filled up and strengthened. Thus, HCWs should not miss opportunities to help PLHIV safely plan pregnancy if only PLHIV initiate discussion about their reproductive need. Secondly, it could be seen that there is unmet need for provider-initiated communication about fertility desire and intention in clinical care. This study failed to deal with discussion and communication between PLHIV and their partner or HCWs in detail which is in need to be addressed further by other studies. Yet encouraging discussions about SRH issues is unquestionably critical enabling PLHIV to safely decide on whether having or avoiding pregnancy. This might need a pre-scheduled and established pre-conception and reproductive service at chronic HIV clinic.

5.4.4 Fertility Desire, Intention, Disclosure and Knowledge of Once HIV Status

Even though there is insufficient communication between PLHV and their partner and HCWs, this study has highlighted the encouraging disclosure (96.4%) and knowledge of once HIV status (93.6%). Being aware of once HIV status and disclosing oneself are vital in prevention of partner and offspring from HIV transmission.

Respondents who had already disclosed their HIV status to their partner are 82% less likely to plan for future childbearing as compared to those who failed to do so (Odds Ratio (OR):0.1811 95%CI 0.385-0.8518, p-0.0305). Study done in Nigeria (Oladapo et al 2005:6) supported this finding; those who disclosed their serostatus to their spouse were less likely to disire children than those who did not disclose (AOR:0.01, 95%CI 0.00-0.07). Laursen et al (2013:e851) from Denmark aslo indicate that non-disclosure is associated with fertility desire However, this is in contrary to the study finding of Kaida et al (2011:353-54) where there was no significant difference in childbearing desire by disclosure of HIV status. It is also against the finding by Alemayehu and Aregay (2012:130) who reported that those who disclosed their HIV status to the partner were 1.7 times likely to have a desire for fertility as compared to those who failed to do so. These studies were done in different setting during different period of HIV epidemics.

The findings that self-disclosure is associated negatively with fertility desire is not amazing because the impact of disclosure of HIV status on fertility desire underscores its importance in promoting healthy sexual behavior and positive decisions among PLHV.

Close to 93% had reported to know the HIV status of their partner; 72.3% HIV+ve concordant and 21.3% HIV-ve discordant couples. Studies carried out in Uganda (Maier et al 2009:28 and King 2008:232) are inconsistent with this study; many cohabiting couples don't mutually know their HIV status. A facility based study in Uganda shows out of 197 of respondents who were aware of their partners' HIV status, 170 (86.7%) reported their partners had HIV positive concordant result (Kakaire et al 2010:3) which is a bit higher than this study. But another facility based study from north part of Ethiopia reports somehow a similar findings where 23% of the respondents' partner were sero-negative; i.e. HIV-ve discordant (Getachew et al 2010:216).

Around 44.7% of respondents who had known the HIV status of their partner reported to plan to have at least a birth in the future. Only 8 of the 20 participants (40%) who did not know the HIV status of their partner reported that they have no intention to have a child in the future; however, it is not statistically significant (Chi-square=1.8, p-value=0.18). However, others studies have shown the association between partner HIV status and fertility desire. For instance, Getachew et al (2010:217) have shown that partners with negative HIV status has a positive association with participants fertility desire. A study among the discordant couples in Uganda by Beyeza-Kashesya et al (2010:247) also reported that positive women couples (64%) were more likely to desire a child than the HIV positive male couples (55 %). The respective figures in this study are 22 (30.1 %) and 17 (23 %) which is much lower than the Ugandan study. In any case, knowledge of a partner's HIV status may be a proxy for duration, intimacy or other unobservable characteristics of primary relationships that affect whether people desire and expect children (Chen et al 2001:150).

5.4.5 Fertility Desire, Intention and Educational Level of PLHIV

Though it was only during bivariate analysis, this research highlighted attending high school and above level of education is positively associated with both fertility desire (OR: 1.55 95%CI 1.07-2.26, P=0.02) and intention (OR: 1.57 95% 1.07-2.27, P=0.02). A similar cross-sectional study in northern Ethiopia in six health facilities among male and female PLHIV by Getachew et al (2010:217) found out that, educational status were statically associated with decision to have a child. Similarly, study in Denmark (Laursen et al 2013:e851) has revealed completing high school is associated with fertility desire. Study from Nigeria also show that 69.8 % of those who attended at least secondary school and 54.1% of those attended below that desire to have a birth but there is no significant difference(p=0.062) (Oladejo et al 2005:40). Alemayehu and Aregay (2012:130) from Ethiopia & Mmbaga et al (2013:86) from Tanzania did report, however, have pointed out that attending formal education was not significantly associated with fertility desire in PLHIV.

Participants who have undergone formal education might hope for the presence of ART. Also education in women may contribute in decision making autonomy on reproductive need. Researches have also shown that education induced decision making autonomy; independent of men authority facilitates fertility regulation (Saleem & Bobak 2005: 1742). In addition, a well-educated PLHIV can have a better awareness about the advantage of PMCTC or ART in

reducing both vertical horizontal HIV transmissions as result their fertility desire or intention anticipated to be higher than the less educated individual (Berhan and Berhan 2013:6).

5.4.6 Fertility Desire, Intention and Residential Area of PLHIV

It was noted that rural participants were less likely to intend for child in the future as compared to the urban. The explanation could be that the rural participants might have had already enough number of children or higher family size. Close to 72% of the rural participants reported to experience more than two births as compared to only 42.8% of the urban which is statistically significant (Odds Ratio(OR): 3.44, 95%CI 1.95-6.10, p-value=0.0000). A fewer family size(1-3) was reported by the 38.4% of urban participants as compared to the 14.5% of the rurals (Odds Ratio (OR): 0.27, 95%CI 0.14-0.55, p-value=0.0000).

Younger urban dwellers are intending for more births in the future. Most women living in the large urban area intend to become pregnant and possibly be related to differences in demographic characteristic or access to service. Thus, this can have an impact on the health care program and policies on fertility for HIV+ve individuals. Urban is a high population dynamics. Ethiopia is a rural population with a current rapid urbanization as migration to urban is high (Hunnes 2012:1). HIV is also highly prevalent in urban setting (1.8%) (CSA 2012:232). Thus, this is an area of program officers and policy maker's consideration as a 'hot-spot' for HIV transmission and population dynamics.

Study to see fertility will of rural reproductive age mother in Northern Ethiopia in the background of self perceived HIV infection and child mortality indicates that fertility desire is 32% (Tamiru M, Haile-mariam D and Mitike G. 2012:380). This is higher than the findings in this research, 15 (21.7%) in rural participant and 7 (25%) in the rural females. Tamiru et al (2012:380-81) state that 47% of rural population and 89.9% of rural females did not want any more children. In the rural population of this fertility desire study, 77.6% of them didn't desire a birth and it is higher among the rural females (78.6%). In this study only 69 rural PLHIVs participated. In fact, further survey has to be cascaded to explore the fertility desire in rural Ethiopia with a better valid research design and higher sample size. The increasing tendency to limit child birth in rural Ethiopia, especially among the females still heralds the need to give a priority to them to minimize unmet need of family planning.

5.4.7 Fertility Desire, Intention and ART/PMTCT

It was also found that there is no statistically significant association between ART and fertility desire and fertility intention. This is in line with most studies both in developed and developing countries. The Papawa guinea study indicates that ART status has no significant association with desire for childbearing (Aska et al 2011:203). According to the South African study by Kaida et al (2011:352), ART users and ART naïve women were equally likely to report childbearing desire. The study from North Ethiopia has also found out that being on ART has no significant influence in the future desire of children (Alemayehu and Aregay 2012:130). A Ugandan study has indicated ART status of HIV patient did not influence the desire for children, too (Kipp et al 2011:1).

The lack of association between ART use and fertility desires has been attributed to the fact that with rapidly increasing access to ART, those not yet enrolled are confident enough to enrol once they become eligible, thereby minimizing the differences between the groups (Kaida et al 2011:350). This might also imply that ART initiation status is not a factor for fertility desire or intention. This is further strengthened by the findings from quantitative study in South Africa by Laher et al (2009:47) who reported that ART use modifying fertility intention was not observed among HIV+ve women interviewed. Therefore, actual feeling, physiological status of the person and social and family related predictors such as number of births and partner fertility desires are more important (Berhane and Berhane 2013). Yet one can be optimistic of longer life due to ART could impact more on the desire (Kaida et al 2009:350).

In this study, most of the participants had already started ART (80.2%) and the median duration after ART initiation was 33 months. Also, participants on ART had higher fertility desire (43.1%) and intention (44.2%). This had happened during the early stage of ART expansion in Ethiopia (FMOH 2012). It was described by Schwartz et al (2010:69) that it was during the early ART initiation period that PLHIV showed high reproductive needs. This is a period when the health of PLHIV is suboptimal (Schwartz et al 2010:69) warranting pre-conception counseling.

Nevertheless, other studies done in Ethiopia shows a statistically significant association of fertility desire and ART (Tesfaye et al 2012:20). This might be due to the fact that participants

might be aware of impact of ART on the reduction of HIV transmission (MTCT). In this research, however, the advantage of ART to have a negative child was reported by only 44 (21.8%) of the participants and fear of MTCT was also reported as the reason not to have HIV positive child only in 16(6.3%) of the participants.

Eventually, the study in USA reveals there is a reduction in fertility desire after ART (Stanwood, Cohn, Heiser, and Pugliese 2007:294–298). Nigerian researchers have also shown same findings where being on ART is associated with a decline in the desire to have a future birth (Oladapo et al 2005:4).

Most studies are predominantly quantitative and explanations for the changing relationship between ART use and fertility desires in specific contexts are largely unclear.

5.4.8 Fertility Desire, Intention and Being in Relationship

As compared to the married participants (43.3%), higher proportion of never married single (67.7%) and non-married partners (83.3%) responded to have a child. House wife, 76% of whom had been already in relation and 17.9% of whom reported to have 4 or more children, were the least (29.1%, 23) to intend for future childbearing as compared to the non-married partners. Consistent with this finding, Alemayehu and Aregay (2012:647) indicate that married participants were less likely to desire for a child as compared to non-married. Also, cited by Oladepo et al (2005:5) 56.3 % of currently married and 68.7% of those not married desired to have a pregnancy though the difference is not significance ($p=0.1213$). Single women might intend children from cultural influence. This is more pronounced in younger unmarried PLHIV who are still in their early reproductive age would be expected to desire to desire children. In Ethiopia community having children is also highly valued (Getachew et al 2010:214) and considered as social security.

In contrast to this study, (*Tamene and Fantahun 2007:224*) have found out that married or those in relationship were more likely to desire for future childbearing. A cross-sectional study in northern Ethiopia by Getachew (2010:217) reveals that 18.3 % of currently married women decided to have a child which is much lower than the 44.3% in this study. Studies in Tanzania (Kawale et al 2014:769) and UK (Cliffe et al 2011:1093) have indicated that being in relationship has an association with fertility desire. Study by Aska et al (2011:201) in Papua guinea shows current cohabiting with a partner has positively related with fertility desire.

Widowed were the least to desire for future fertility (18.9%) and also the least to intend for at least a child (10.20%). This study shows that married women has got higher fertility desire as compared to those who were widowed (44.3% vs 18.9%; Odds Ratio (OR):0.2928 95%CI 0.1421-0.6035). When computed for only rural participants, divorced or widowed participants were 69% less likely to desire children in the future as compared to married one. The rural Tanzania study showed also that PLHIV who were separated or divorced were 60% less likely to desire children in the future (Mmbaga et al 2009:86). This might be due to the fact that those group of women without children or with social instability may be imposed of fear about childbearing.

Study participants who were in relationship for longer period of time were less likely to desire for a child as compared to those who had relatively been in relationship for shorter period of time (Odds Ratio (OR): 0.91, 95%CI 0.87-0.94, p-value=0.0000). The greater proportion of participants who were in relationship for 1-10 years (53.8%) were having a plan to have at least one birth in the future as compared to only 32.6% of those who were in relationship 11 or more years and this is also statistically significant (Chi-square=14.38, p-value=0.00). In other words, participants who were in relationship for longer period of time were less likely to desire for a child as compared to those who had relatively been in relationship for shorter period of time (Odds Ratio (OR): 0.91, 95%CI 0.87-0.94, p-value=0.0000)

Aska et al (2011:200) found that duration of relationship with a partner has an association with desire for fertility. Being in relationship for less than 5 years was found to be associated with fertility desire in a cross-sectional study of South Africa (Myer et al 2007:278). A similar study by Getachew et al (2010:217) showed that duration of stay with current partner is significantly and negatively associated with fertility desire. Stanwood et al (2007:294) in their cohort study have also shown that having relationship duration of less than 2 years is strong predictor of future childbearing.

5.4.9 Duration after HIV DX ART Initiation

The study suggested that desire and intention for fertility did not change with duration after HIV diagnosis and ART initiation. Similar finding is noted in South Africa study by Kaida et al (2011:350) where childbearing desire of HIV positive women is not differing by duration of HIV diagnosis. Aska et al (2011:198) have shown that desire for future fertility does not differ with

duration on ART. Similar finding is also reported by Alemayehu and Aregay (2012:201) in northern Ethiopia.

Kawale et al (2014:769) have shown that duration of HIV more than two years (OR: 2.00, 95% CI: 1.08-3.67, $p = 0.03$) were associated with increased odds of desire for a child. The influence of longer time since diagnosis of HIV infection may reflect the cumulative effects of decisions made by PLHIV who had weighed the consequences of their wish for childbearing over several period of time.

However, study in Nigeria (Oladepo et al 2005:4) and South Africa (Myer et al 2007:278) indicated that there is a negative association a between duration after HIV diagnosis and duration after ART initiation respectively. Individuals with recently diagnosed with HIV infection may still be undergoing an adjustment to their sero-status, and parenthood may be a coping method to reject the infection related stigma. Yet further evaluation is needed using longitudinal design to see the effect of duration in relationship and duration after HIV diagnosis and ART initiation.

5.4.10 Fertility Desire, Intention, Total Births Owned

EDHS of 2011 has reported that the fertlity desire is related to the number of living children women already owned. Thus, 90% of married women with no children want to have a child (Central Statistical Agency [Ethiopia] and ICF International 2012:82) as compared to 86.1% in this study. Also 9% of married women with one child report that they want no more child in the general population (Central Statistical Agency [Ethiopia] and ICF International 2012:82) as compared to 29.6% in this study. It has to be noted that the EDHS 2011 is not diaggreagetd by HIV status. Even then it is shown that having fewer children or having no children is assciated negatively with both fertility desire and intention.

A lot of other studies have shown that participants with out a child were more likely to desire for a child (Aska et al 2011:198; Kawale et al 2014:769; Nöstlinger et al 2013:251; Oladapo et al 2005:3). Tamene and Fantahun (2007:225) from Ethiopia have also mentioned that study participants without a child were more likely wanted to bear a child in the future (Adjusted Odds Ratio (AOR):11.5, 95%CI 5.3-24.9). A survey in UK has also found out that having fewer than two children is one of the factors associated with high need for future childbearing (Cliffe et al 2011:1093). Heys et al (2009:S3) from Uganda has reported that having a greater number

of living children is one of the independent predictor to stop childbearing as well. As noted above fertility desire is more likely in those participants reported to have 2 or less over all births (For females: Odds Ratio (OR), 2.68, p-value=0.0004 and for males Odds Ratio (OR): 4.98, p-value=0.0000). The rural Tanzanian study by Mmbaga et al (2009:86) has reported that having more than two children was associated with reduced likelihood of desiring more children among females.

The fact that PLHIV with a fewer children or no children after HIV diagnosis showed high fertility desire and intention might not be surprising. This reflection can be of the majority of human being in the fertile age regardless of HIV infection. The cultural value of children in the identity and social status of PLHIV has been reported in studies in South Africa (Cooper et al 2007:274) as well.

Eventually, more births are appreciated in the concordant couples as compared to in the discordant. This implies the need to focus on couple counselling especially in the concordant couples where there is a potential higher risk of re-infection with new HIV strain (Kaiser et al 2011:7842).

5.4.11 Fertility Desire, Intention, Birth Experience after HIV Diagnosis and after ART Initiation

This study is peculiar in that it has also looked into association between fertility intention and desire with births after HIV diagnosis and after ART initiation. Proportion of participants with no birth experience after HIV diagnosis and ART initiation was higher. Only birth experience after HIV diagnosis was associated with fertility intention, however. So, fifteen (71.4%) participants with 2 or more births experience after HIV diagnosis reported they have no fertility intention as compared to the 165 (53.7%) of those with no previous birth after HIV diagnosis. In addition, as the number of births previously experienced by the study participants is increasing, the plan not to have a birth is also increasing; for instance, from 8.8% with no child to 78% of respondents with more than 3 children. It has also been shown that the proportion of respondents who had birth after HIV diagnosis (29.5%) is much higher than the Ugandan study by Kakaire, Osinde and Kaye (2010:1) who reported that more than 17% had produced a child since HIV diagnosis.

Irrespective of HIV status thus childbearing is as important to PLHIV as their non-infected counterparts. African social and cultural values dictate that having children is important to the

identity and social status of men and women, including for PLHIV (Sonko S. 1994:397). Childbearing helps secure a marriage, and lineage continuity and family often apply pressure to reproduce

5.4.12 Fertility Desire, Intention and Use of Family Planning

The proportion of participants using a contraceptive (54%) is more than the contraceptive use reported from a similar setting among PLHIV on chronic ART follow up in Gondar of 100 (25.7%) (Tesfaye et al 2012). *However*, Tamene and Fantahun (2007:225) have come up with similar findings where 246 (53.5 %) were using a family planning. This finding is also in line with the result of study in Uganda where injectable, OCP and condom utilization is higher. In this Ugandan study, condom use is even higher (by females=54.9% and by males=61%) (Kipp et al 2011:1) than in this study; reported use of condom by females and males was 48.7 % and 59.1 % respectively.

Around 32.4% of the unmet need for family planning is higher than the general population where 25% of the currently married women have unmet need for family planning (Central Statistical Agency [Ethiopia] and ICF International 2012:102). The high unmet need of family planning in this study is consistent with studies from developed countries (Nöstlinger et al 2013:251 Robinson 2014:13s). Though the smaller sample size in the study is a limiting factor for generalization, the higher unmet need for FP among HIV positive people is a risk factor not only for unintended pregnancy but can be for MTCT of HIV. This underscores the gap in the national prevention of MTCT of HIV strategy. Therefore, HIV infected women can be empowered to prevent unintended pregnancy.

Respondents who did not use a birth control were 1.5 times more likely to desire for a future birth (Odds Ratio (OR): 1.5276, 95%CI 1.0543-2.2134, p-value=0.025). This is in contrary to other studies (Aska et al 2011:201); Laher et al (2009:47). The desire to limit childbearing (56.1%) is reported to be high among PLHIV. Yet, not more than half of the study participants (46.1%) were using one of the modern family planning. Above all, the unmet need for family planning among the study participants is even higher (32.4%). This is an indication that the potential vertical transmission of HIV is apparent from this study even though studies have shown that maternal transmission of HV can be reduced to about 2% (The International Perinatal HIV Group 1999:977). Again, this result is a concern because there is high need of fertility among the 21% discordant couples, only 46.1% were using family planning. The low

proportion of use of contraceptive among PLHIV during ART expanded era goes with the cohort study by Myer et al (2009:1) which also state that ART is associated with high pregnancy rate.

It was also seen that fertility desire is lesser for older age, those with higher birth and female sex. Yet, the reported use of long term contraceptive is only 12.3% in the study participants and 11.2% in their partners. This may imply that counselling on and supply of long term use of family planning has to target these groups of population. The barriers to utilizing family planning service have to be jointly addressed by HIV/AIDS care and prevention and family planning programmes.

5.4.13 Fertility Desire, Intention and Pregnancy

Though not established what proportion of these reported pregnancies were intended or not, pregnancy rate among the study population of PLHIV was 6.5% .This is not insignificant proportion among PLHIV as compared to the 7% in the general Ethiopian women in EDHS (CSA 2012:72:). Out of the 91 HIV positive discordant couples, 4 of them reported that they or their participants were pregnant (4.4 %). This figure is lower than the institution based cross-sectional study in Uganda among 228 mutually disclosed sero-discordant couples by Beyeza-Kashesya, Ekstrom, Kaharuzza, Mirembe, Neema and Kulane (2010:247) where 12% of them were pregnant or their partners were pregnant.

Pregnancy is still an indicator of engagement in unprotected sex. Moreover, 46.6% of the respondent and 34.3% of their partners were reported to use no contraceptive. There are a few of self-reported use of injectables alone (22.6%) or in combination with condom (23.4%). This could indicate the threat of MTCT. However, only 16 (6.3 %) of the participants mentioned the fear of MTCT as a reason not to have a child in the future. Unmet need for family planning among PLHIV in this study is even higher (32.4%). Around 29% (72) of the participants were abstaining or not using contraceptive still try to avoid pregnancy. These all are policy and program challenges. Thus, these reinforce the need for increased reproductive health services including family planning as well as educative health managers to enable HIV infected people have informed decisions about their reproductive and sexual needs

5.5 SUMMARY

To inform the chronic HIV clinic an integrated SRH service and suggest the partner involved comprehensive reproductive need counselling this cross-sectional facility based study was carried out to determine the magnitude of both fertility desire and intention and associated factors in Southern Ethiopia based on the TDIB theoretical framework. It was indicated that the proportion of fertility desire and intention after the expansion of ART and PMTCT is higher than previous studies in Ethiopia. Future fertility planning of PLHIV was associated independently with birth experience after HIV diagnosis, total births owned and partner fertility desire. Complex socio-demographic, cultural and economic reasons were highlighted as reasons to have and to avoid pregnancy. Communication made with partner and HCWs to discuss about pregnancy and minimal use of family planning to avoid conception were mentioned as some of actions taken by PLHIV to avoid pregnancy. These all heralds the need to have a multi-faceted, partner participated and very comprehensive counselling at an integrated chronic HIV clinic with SRH service improving the communication HCWs have with PLHIV.

5.6 RECOMMENDATIONS

5.6.1 Recommendations to researchers

As repeatedly described this is a cross-sectional study with a few numbers of rural populations (15%). Thus it is important to cascade same research in the rural area or in other area where urban and rural community is well represented. It is preferable if a more vigorous study designs are used to find out as to when exactly PLHIV wanted to have a child in the future and also whether the pregnancies are timed and wanted. This might warrant a longitudinal study design. Thus, it is recommended to carry out a stronger valid research like longitudinal studies to found out the real prevalence and incidence of pregnancy in PLHIV especially after ART in the maturing program of HIV/AIDS and see whether these pregnancies are intended or unintended. Moreover, the TDIB theoretical frame work has to also be verified and used again in the longitudinal studies.

5.6.2 Recommendations to health care providers

It is encouraging that most of the participants have consulted health care providers (68, 34.2%) because they wanted to have a child in the future. Therefore, open discussion regarding reproductive issues ought to be encouraged. Health care providers, on the other hand also need to be supportive in a non-directive and non-judgmental manner to assist couples to

identify their reproductive options and enable them to come up with an informed decision. Thus, HCWs need to be trained and oriented on the details of SRH to enable them capable of rendering the counselling of SRH as well as care and treatment of PLHIV

The study shows that the prevalence of fertility desire and intention is not insignificant among PLHIV. Use of family planning is not optimal among PLHIV. It is also indicated that unmet use of family planning is also unexpectedly high. This heralds the need for strong counselling on SRH and HIV. Couple counselling and involvement of partners is also a key activity in need to be rendered. This is because partner is found to have an influence on the fertility desire and intention of the study participants.

5.6.3 Recommendations to program people

Non- married younger individual who are still in their early reproductive age are expected to desire children than older ones. Therefore, a focus on younger is vital as the resource in Ethiopia is dependent on agriculture where the young are the technicians. This might necessitate the need to identify special SRH of younger age –focused. This could be like the youth centre being implemented in some health facilities in Ethiopia by the non-governmental organizations. Thus, it is recommended that youth centres should be part of reproductive health system in the government system.

Integration of HIV care and support and SRH service specifically the contraceptive service into other health care might be considered. Moreover, health system must be improved to provide special SRH service tailored to PLHIV and in particular to PLHIV with discordant results. Such service could include use of dual and double contraceptive, information regarding use of ART and hormonal contraceptive, counselling on the pre-conception strategies etc.

It was also noted that, widowed and divorced PLHIV were found to be less likely to use condom as compared to the married ones. Condom promotion may be more effective targeting divorced or widowed than the married. In either of the cases it is clear that barriers remain for HIV+ve women to use condom especially in the male dominated society. Thus, integration of hormonal contraceptive and condom use promotion in ART program may help to address some of these barriers to use condom. Above all the study findings highlight the need for

reproductive health programs for HIV clients to incorporate safer conception counseling and improved communication regarding childbearing into a partner-involved counselling protocol.

5.6.4 Recommendations to health policy

Though not statistically significant, 57.4% of female participants and about 47% of their partners reported to avoid childbearing as compared to 54.8% of the males and only 37.5% of their partners. The 32.4% of unmet need for family planning is not insignificant. Thus, it is recommended to scale up the second prong of the strategy to prevent MTCT because it is cost effective, right based approach to preventing incidence of MTCT of HIV (WHO 2012.). Moreover, the integrated approach for both of HIV and family planning and other SRH service has to be at all levels of program planning, coordination and implementation. There might be a national strategy of “One Stop-Shopping” service for PLHIV regarding HIV/AIDS care and SRH services under one roof. Moreover, a partner based counselling protocol containing comprehensive SRH can be developed to be used at chronic HIV clinics.

5.7 CONTRIBUTION OF THE STUDY

The first contribution of the study is that it could able to differentiate concepts, fertility desire and fertility intention. The detected high prevalence of the fertility desire and intention in the back ground of the maturing HIV/ART program in Ethiopia where a fund for the program is reducing heralds the need to come up with cost effective and sustainable implementation of HIV and SRH, specifically decentralization and integration of the services.

Above all, if this study is complemented by other rigorous studies, it can change the national policy to the ideology of strong integration and “One-Stop shopping’ strategy. Moreover, couple counselling and involvement of partners especially men/husbands during ANC, delivery and post partum both for HIV testing and FP counselling is critical. The study also paves a way for other similar studies using the theoretical frame work of TDIB to the analysis of the details of fertility desire and fertility intention.

5.8 LIMITATIONS OF THE STUDY

The interpretation in this research should be with care as there were limitations to it. Information regarding the partners of the participants was obtained from the study participants who are not expected to be perfect. Because of the sensitivity of the fertility issue in Ethiopia

respondents may not express their genuine desire or intentions. Thus, interpretation of the partners and fertility desire should take these limitations into consideration.

Study was done in facilities with chronic HIV and ART care where counselling service is relatively better. The research also relied on reported desire, intention and behaviour. It is also an observational/non-experimental and cross-sectional.

More of the urban population (85%) and a few of the rural population (15%) were involved which is a threat to generalization. Thus, community based studies might be warranted. This similar research can be carried out in the rural health facilities or in the community. Moreover, the researchers did not examine the full area of determinants of fertility desire and fertility intention like CD4 level of the participants and WHO clinical staging of the PLHIV. Most researches have considered having lost children and fertility desire which was failed to be captured in this study as well.

Nevertheless, the fertility desire and fertility intention study is not without strength. It is a very few of studies in Ethiopia making use of the TDIB theoretical framework to describe the fertility decision making among PLHIV. The direct children, measure of future fertility desires and intentions distinguish between the "desire" and "intention" of having children, both of which are important connection between childbearing motivation and reproductive behaviour (Miller 1994:223). It alleviates any potential confusion with labels such as "intended", "wanted", or "planned" that are commonly used in surveys lacking consistency (Klerman 2000:155). Better understanding of desires and intentions and how they affected by HIV infection and ART would lead to more effective strategies to reach PLHIV who desire family planning services. More questions were also answered as it is an interview introduced questions increasing the response rate (93. %). This has lead to a relatively larger sample size. As witnessed in the literature review this is also a few of studies which involved both sexes. Most researches were done only involving females.

5.9 CONCLUDING REMARKS

During the period when ART and PMTCT services are being expanded, this study highlights high fertility desire and intention in the background of unacceptably higher unmet need for family planning. This is a concern for both vertical and horizontal HIV transmission. Above all, partner influence on fertility decision making is immense with higher male gender fertility need

in the male dominated Ethiopian culture necessitating a development of comprehensive male partner-involved couple counseling protocol, emphasizing on multidisciplinary care focusing on good communication between PLHIV and their partner and HCWs on safer conception methods and timed unprotected intercourse to be implemented at chronic HIV clinic. A lot of non-HIV related cultural, social, and economic and health factors were mentioned as determinant factors for PLHIV's fertility decision making heralding that fertility limiting factors for general population should also be working for PLHIV. Therefore, strengthening all the components of PMCT integrating with other SRH at chronic HIV clinic focusing on the participation of male partner is critical.

On the London Summit of Family Planning Co-hosted by UK government and Malida & Bill Gate Foundation, July 2012, the Secretary of State for International Development, Andrew Mitchell, said: "This is a breakthrough for the world's poorest girls and women who will transform lives, now and for generations to come. The commitments made at the Summit today will support the rights of women to determine freely, and for themselves, whether, when and how many children they have." London Summit on Family Planning, July 2012. Therefore, conception in the presence of HIV needs to be informed to reduce the risk of infection to partners and children. Further, paternal support plays a role in maternal HIV and pregnancy management. Policy makers and health care workers need to understand that fathers and fathering, and need to approach sexual and reproductive health issue including HIV from a family perspective.

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ANNEXURE I**Written Consent form for the interview**

My name is ----- . Here at -----Hospital/health centre Chronic HIV care unit, we are interviewing men and women PLHIV on follow up care to evaluate their fertility desire, intention and associated factors. We believe that this study would help to bring change in fertility and family planning services for HIV positive people on chronic HIV care. We would like to assure you that your name will not be mentioned in the questionnaire and the information that you give us will be kept confidential and only used for research purposes. You have a full right to refuse to take part or to interrupt the interview at any time. But the information that you will give us is quite useful to achieve the objective of the study and to bring change in the fertility and family planning service provision for HIV positive people on ARV treatment. It will take 20-25 minutes to respond to the interview. Are you willing to participate in the study?

1- Yes

2 - No

(If the answer is yes, thank the patient. Then have the signature and conduct the interview. Otherwise, the patient is not forced to participate)

Name _____ and _____ signature
 (Interviewee).....Date.....

Name _____ and _____ signature
 (Interviewer).....Date.....

ANNEXURE II

Structured interview Questionnaires for the study of Fertility desire and Fertility intention of PLHIV on chronic HIV care in Hawassa City, Ethiopia.

Patient Instruction: You have been selected by chance to take part in this interview. It will take a few minutes. Because HIV can affect the child bearing desire and intention of PLHIV, it is important to ask you some questions about your fertility desire and intention as well as some factors affecting the desire and intention. Your name, address or any identification will not be collected. Your answers will remain confidential so please be honest.

PART I: Socio-demographic Characteristic

Questions	Category
How old are you?	.....age in completed years
What is your sex?	1. Male 2. Female
To which ethnic group do you belong to?	1. Sidama 6. Cambata 2. Wolayita 7. Hadiya 3. Gamo 8. Gurage 4. Amhara 9. Oromo 5. Gedeo 10. Others (specify).....
What is your religion?	1. Protestant 2. Orthodox 3. Muslim 4. Catholic 5. Other (specify).....
What is your current marital/relationship status?	1. Married 4. Widowed 2. Single 5. Non married partner 3. Divorced 6. No response
If you are currently married or in a relationship, how long have you been in the relationship or in marriage?	.....in complete years
What is your highest educational level you achieved?	1. Unable to read and write 4. High School (9-12) 2. Primary school (1-6 grade) 5. Above high school 3. Junior Secondary school(7-8)

	211
What is your current occupation?	1. Unemployed 6. Merchant 2. Student 7. Commercial Sex worker 3. House wife 8. Government employ 4. House servant 9. Private employee 5. Daily laborer 10. Farmer/peasant 11. Other (Specify).....
What is the average monthly income in your household?	.... ..Ethiopian Birr 1. Don't know 3. No response 2. No income
Where is your current residence?	1. Urban 2. Rural
What is your family size?	..... person(s)

FERTILITY HISTORY

	How many births have you had?	..... births
	How many births have you had before HIV diagnosis?	.....births
	How many births have you had before ART initiation?	.....births
	How many births have you had after the HIV diagnosis?	.....births
	How many births have you had after ART initiation?	.....births

HIV AND ART HISTORY

	How long has it been since you were diagnosed with HIV?	.....months
	Have you started ART?	1. Yes 2. No
	If so, how long is it?	.....months
	How do you feel after ART?	1. Improved 2. Aggravated 3. No change

PARTNER CHARACTERISTIC OF STUDY SUBJECTS

	How long have you stayed with your partner?	..... months/years
	Does your partner desire to have a child?	1. Yes 2. No
	Did you tell your partner that you are HIV positive?	1. Yes 2. No
	Has your partner tested for HIV?	1. Yes 2. No
	If your partner tested for HIV, what are the test	1. Positive

	results?	212 2. Negative 3. Don't know
--	----------	--

HISTORY OF FAMILY PLANNING

	Are you using contraceptive?	1. Yes 2. No
	If yes, which type of contraceptive are you using?	1. Oral contraceptive pills 6. Condom 2. Inject able 7. Double contraceptive 3. IUCD (condom and others) 4. Implant 8. Others (specify)..... 5. Abstain
	Does your partner also use a contraceptive?	1. Yes 2. No
	If yes, which type of contraceptive is s/he using?	1. Oral contraceptive pills 2. Injectable contraceptive 3. IUCD 4. Implant 5. Abstain 6. Condom 7. Double (condom and others) 8. Others

FERTILITY DESIRE, INTENTION AND ACTION OF HIV-POSETIVE PEOPLE TO HAVE A PREGNANT

	Would you like or desire to have a/another child in the future?	1. Yes 2. No
	If yes to Q 130, Why?	1. No child before 2. Fear of childless stigma 3. Importance of parenting 4. No available contraceptive 5. Partner desire 6. I am healthy 7. Can have HIV negative child due to ARVs use of ARVs

<p style="text-align: center;">213</p>	<p>8 .Other (specify)</p>				
<p>If no to Q130, why?</p>	<ol style="list-style-type: none"> 1. Not to have HIV negative child 2. Enough children 3. Partner does not want to have a child 4. Others (specify)..... 				
<p>How many children do you intend to give birth to in the future?</p>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">1. 0</td> <td style="width: 50%;">3. 2</td> </tr> <tr> <td>2. 1</td> <td>4. Greater than 2</td> </tr> </table>	1. 0	3. 2	2. 1	4. Greater than 2
1. 0	3. 2				
2. 1	4. Greater than 2				
<p>If your response to Q133 is other than '1', what did you do to have a child?</p>	<ol style="list-style-type: none"> 1. Approached to my partner 2. My partner has approached me 3. I have talked to health care provider 4. I have stopped using contraceptive 5. I am not using contraceptive and currently pregnant 6. Others (specify)..... 				
<p>If your response to Q133 is '1', What did you do not to have?</p>	<ol style="list-style-type: none"> 1. I am using contraceptive 2. My partner is using contraceptive 3. I am not using contraceptive but trying to avoid pregnancy 4. Other (specify)..... 				

ANNEXURE III. Letter of ethical clearance from UNISA


UNIVERSITY OF SOUTH AFRICA
Health Studies Higher Degrees Committee
College of Human Sciences
ETHICAL CLEARANCE CERTIFICATE

HSHDC/30/2012

Date of meeting: 16 March 2012 Student No: 4493-459-9

Project Title: Fertility desire, intention and associated factors among people living with HIV in public health facilities of Hawassa City, Ethiopia.

Researcher: Zewdu Gashu Dememew

Degree: Masters in Public Health Code: DIS4986

Supervisor: Prof NA Phaladze
 Qualification: PhD
 Joint Supervisor: -

DECISION OF COMMITTEE

Approved Conditionally Approved

Prof E Potgieter 
CHAIRPERSON: HEALTH STUDIES HIGHER DEGREES COMMITTEE

for 
Dr MM Moleki
ACTING ACADEMIC CHAIRPERSON: DEPARTMENT OF HEALTH STUDIES

PLEASE QUOTE THE PROJECT NUMBER IN ALL ENQUIRES

ANNEXURE IV. Letter of request to SNNPR to conduct a study

ATO ATC YOHANNES LETAMO

HEALTH RESEARCH AND TECHNOLOGY TRANSFER SUPPORT PROCESS OWNER
SOUTH NATIONS NATIONALITIES AND PEOPLE'S REGIONAL STATE HEALTH BUREAU
HAWASSA

RE: REQUEST TO CONDUCT A STUDY

Dear Ato YOHANNES:

I am a final year student of Masters of Public Health (MPH) at University of South Africa (UNISA) of distance education. I am required to complete a dissertation of limited scope before obtaining the above-mentioned qualification.

I intend to do a study of **FERTILITY DESIRE, INTENTION AND ASSOCIATED FACTORS AMONG PEOPLE LIVING WITH HIV IN THE CONTEXT OF CHRONIC HIV CARE INTRODUCTION IN PUBLIC HEALTH FACILITIES OF HAWASSA CITY, ETHIOPIA**. The proposed study requires soci-demographic, fertility desire and intention, and HIV related data from the interview of PLHIV within a month time from HAWASSA referral hospital, LOKE health centre and ADARE hospital.

Therefore, I am requesting a permission to conduct the study. This study is quit significant not only for academic qualification but also for family planning program interventions, for population policy formulation and to deal with low unmet need of contraception among PLHIV in the nation.

The issue of ethics has been seriously considered and covered in the attached proposal. All information will be handled confidentially and all copied information (no name of patients) will be destroyed once the data analysis has been completed.

Let me assure you that if permission is granted and the study is completed, findings will be disseminated to regional bureau.

Sincerely
ZEWDU GASHU DEMEMEW (MD)
LEAD TB/HIV ADVISER
JHU-TSEHAI
P.O.BOX 1128
HAWASSA


Zewdu Gashu
June 05, 2012

ANNEXURE.V Ethical approval letter from SNNPR IRB



የደቡብ ብሄሮች ብሔረሰቦችና ሕዝቦች ክልላዊ
መንግሥት ጤና ቢሮ
South Nations Nationalities and People's Regional
State Health Bureau



ቁጥር 2023-28/3724
Ref. No
ቀን 28/9/04
Date

**Southern Nations Nationalities and Peoples Regional State Health Bureau Health
Research Ethical Clearance Form (Office use)**

Name of researcher:- Zewdu Gashu Dememew

Name of the institution:- JHU/Tsehayi ,Hawassa

Title of proposal:- Fertility desire, intention and associated factors among people living with HIV in public health facilities of Hawassa City, Ethiopia.

Dear

The Regional Health Bureau Research Ethical Review Committee has reviewed the
aforementioned project proposal with special emphasis on the following points;

1. Are all ethical principles considered?

- 1.1 Respect for person: Yes No
- 1.2 Beneficence: Yes No
- 1.3 Justice: Yes No

2. Are the objectives of the study ethically achievable? Yes No

3. Are the proposed research methods ethical sound? Yes No

4. Comments of the ethics committee:

Based on the above mentioned ethical assessment the regional Ethical clearance
committee has

A. Approved the proposal for implementation





የደቡብ ብሄሮች ብሔረሰቦችና ሕዝቦች ክልላዊ መንግሥት ጤና ቢሮ
South Nations Nationalities and People's Regional State Health Bureau

ቁጥር _____
Ref. No _____
ቀን _____
Date _____

Date of the review

Date 23 Month May Year 2012

- B. Conditionally approved
- C. Not approved

Chair of regional ethical committee (REC)

Name የአገልግሎት ሀ-ጸዮ
Yehannes Letamo Hujawa

Date 23/5/2012



Signature [Handwritten Signature]
የደቡብ ብሄሮች ብሔረሰቦችና ሕዝቦች ክልላዊ መንግሥት ጤና ቢሮ
Health research and transfer support process

South Nations Nationalities and People's Regional State Health Bureau Health Research Ethics Review committee Memmbers

Revive committee Member

- Sr.Fekert Abera
- Ato Wassie Shiferaw
- Ato Samson Tadiwos

Signature
[Handwritten Signature]

With best Regards !

ANNEXURE VI. Letter of support to health facilities



የደቡብ ብሄሮች ብሔረሰቦችና ሕዝቦች ክልላዊ መንግሥት ጤና ቢሮ
South Nations Nationalities and People's Regional State Health Bureau

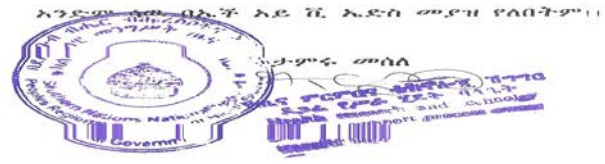
ቁጥር 296-1/13739
Ref. No
ቀን 29/7/04
Date



ለሕዋሳ ከተማ አስተዳደር ጤና መምሪያ
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ሂዋሳ

ጤና ለጥናት ስለሚደረግ ትብብር

ዶ/ር ዘውዱ ጋሽ- የ UNISA የንብርሶች ተግባር ሲሆን የመመረቅ ዕውቀትን በ "Fertility desire, intention and associated factors among people living with HIV in public health facilities of Hawassa City, Ethiopia በሥራ ልማት ስህተት ሲሆን የመመረቅ ዕውቀት የክልሉ ስርዓት ሪቪው ኮሚቴ (Ethical Review Committee) ያፀደቀው ስለሆነ ለጥናታቸው በእናንተ በኩል አሰፈላጊው ትብብር እንዲደረግላቸው እንጠይቃለን።

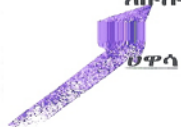


ግልባጭ
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ለጤና ምርምር ቴክኒካዊ ምኞት ደጋፊ የሥራ ህደት
ዶ/ር ዘውዱ ጋሽ-
ሕዋሳ



Ref. No. 29/109/04
Date 29/10/2024

ለአዳሬ ሆስፒታል
ለቡሽሎ ጤ/አ/ጣቢያ



ሆዋላ

ጉዳይ፡- ለጥናት ጉብብር እንዲደረግ አለመግለጽ

ዶ/ር ዘውዱ ጋሹ የUNISA የኒቨርሱቲ ተማሪ ሲሆኑ የመመሪቷ ድህረ-ገጽ ላይ Fertility desire intention and associated factors among people living with HIV in public health Facilities of Hawassa city ,Ethiopia በሚል ርዕስ ስለሚሰሩ አስፈላጊው ጉብብር በእናንተ በኩል እንዲደረግላቸው እንገልጻለን።

“ሌደስን እንግታ ታላችንን እንጠብቅ”!

ገልጻጭ
ለአዳሬ ሆስፒታል
ለቡሽሎ ጤ/አ/ጣቢያ



[Signature]
ጉዕግስት አላቱ
ክሊኒካል ኮራሰር

ፊ.ሮ/ር ዘውዱ ጋሹ



በደቡብ ብ/ብ/አ/ክ/መንግሥት
የሀዋሳ ከተማ አስተዳደር ጤና መምሪያ
S/N/N/T/R/S
HAWASSA City Administration
Health Department

ቁጥር 29189104/40
Ref. No 29189104
ቀን
Date

ለአዳራሽ ሆስፒታል
ለቡሽሎ ጤ/አ/ጣቢያ
ሀዋሳ

ጉዳይ:- ለጥናት ትብብር እንዲደረግ ስለመግለጽ
ዶ/ር ዘውዱ ጋሹ የUNISA የኒቨርሳቲ ተማሪ ሲሆኑ የመመሪያዎች ጽዕ-ፋቸውን በ Fertility desire intention
and associated factors among people living with HIV in public health Facilities of Hawassa
city ,Ethiopia በሚል ርዕስ ስለሚሰሩ አስፈላጊው ትብብር በእናንተ በኩል እንዲደረግላቸው እንገልጻለን።

ገልባጭ
ለአዳራሽ ሆስፒታል
ለቡሽሎ ጤ/አ/ጣቢያ
ዶ/ር ዘውዱ ጋሹ



“ኤድስን እንግታ ታላችንን እንጠብቅ”!
ትዕግስት እላቱ
ክሊኒካል ኦፊሰር

ANNEXURE. VII. Filled sample and piloted of Amharic consent and questionnaire

R103

የምርምር/ጥናት/ ግብረ-ሪያና የሰነድ ማሰባሰቢያ ጽሑፍ

የምርምር ፕሮጀክት ርዕስ: በ-ሳጥላ ከተማ ወሰን በሚገኙ ሰባት የዕረ-ኤች.ኤይ.ቪ/ኤድስ የሕክምና መስጫ የሕዝብ ጤና ድርጅቶች ውስጥ ተከታታይ የሕክምና አገልግሎት የምደረግላቸዋል ከኤች.ኤይ.ቪ ቫይረስ በደማቸው ውስጥ የምገኘባቸዋል ሰዎች የመጠለይ ፍላጎትና ዕቅዳቸውን ለማወቅ የምደረግ ጥናት

የዋና ተመራማሪ ስም: ዶ/ር ዘጠዱ ጋሹ
የድርጅቱ ስም: የኢትዮጵያውያን ሕክምና ተቋማት ማህበረ-ሰብ/የጤና ስርዓት

በየኢትዮጵያውያን ሕክምና ተቋማት የሚገኙ የጤና ሰራተኞች: ከኤች.ኤይ.ቪ ቫይረስ በደማቸው ውስጥ የምገኘባቸዋል ሰዎች እና በሌሎች የዕረ-ኤች.ኤይ.ቪ/ኤድስ የሕክምና መስጫ ጣቢያዎች ተከታታይ የሕክምና አገልግሎት የምደረግላቸዋል ወንዶችና ሴቶች የመጠለይ ፍላጎትና ዕቅዳቸውን ለማጥናት ቃለ-መጠይቅ ለማድረግ የገለበጥ ፍቃድ ነንት መጠየቅዎ ይጠየቃል።

ሰነድ ለመሙላት ይገባል። በዚህ ጤና ጣቢያ/ሰራተኛ የዕረ-ኤች.ኤይ.ቪ/ኤድስ ሕክምና መስጫ ክፍል ተከታታይ የሕክምና አገልግሎት የምደረግላቸዋል ወንዶችና ሴቶች የመጠለይ ፍላጎትና ዕቅዳ ለማጥናት ቃለ-መጠይቅ እያደረጉ ነው። ይህ ጥናት የኤች.ኤይ.ቪ ቫይረስ በደማቸው ውስጥ የምገኘባቸዋል ሰዎች እና የዕረ-ኤች.ኤይ.ቪ/ኤድስ ሕክምና ለምክትተሉ ሰዎች የወሊድ ፍላጎት እና ዕቅድ እንድህም የወሊድ መከላከያ አገልግሎት አሰጣጥ ላይ ለወጥተው የሚገኙ ሰዎች እና ለሌሎች ሰዎች በዚህ መጠይቅ ውስጥ የሚጠቀሱ መሆንን ሳይገባሉት በቃለ-መጠይቅ የምስጢር መረጃ በምስጢር ተይዞ ሰጥኖት አገልግሎት ብቻ የምጠል መሆንን ሳይገባሉት እያዳለሁ እርሶ በዚህ ጥናት ላይ የመሳተፍ፣ የለመሳተፍ ወይም በማንኛውም ወቅት ቃለ-መጠይቅን የማቆረጥ መብት መሰጠት አልቻልንም። ግን እርሶ በጥናቱ ላይ ተሳትፎዎ የምስጢር መረጃ ጥናቱን ወይም ለማድረግ የኤች.ኤይ.ቪ ቫይረስ በደማቸው ውስጥ የምገኘባቸዋል እና የዕረ-ኤች.ኤይ.ቪ/ኤድስ የሕክምና ለምክትተሉ ሰዎች የወሊድ ፍላጎት እና ዕቅድ እንድህም የወሊድ መከላከያ አገልግሎት አሰጣጥ ላይ ለወጥተው ለማምጣት ከፍተኛ ጠቀሜታ አለው። ቃለ-መጠይቅን ለመጨረስ 120-25 ደቂቃ ይወስዳል።

በጥናቱ ላይ ለመሳተፍ ፍቃድዎ ናት?

አ. አዎ

2. አይደለሁም

መልሱ አዎ ከሆነ አመሰግናለሁ ቃለ-መጠይቅን ይከፈሉ

መልሱ አይደልም ከሆነ አመሰግናለሁ ወደ ሌላ ተጠያቂ ይላኩ

ገለበጥን ቃለ-መጠይቅ ላይ ለማሳተፍ ምንም ዓይነት ግስግሜ ወይም ጫና መደረግ የለበትም።

የተሳተፍ ገለበጥ ስምና ፍርግ..... ደ/ር ደ/ር ቀን 24/11/2004

የሰነድ ማሰባሰቢያ ተቀባይ ስምና ፍርግ..... አብይ ደ/ር ቀን 24/11/2004

በዩኒቨርሲቲ የሥነ-ምግባር ስርዓት የጥናት ማስፈጸሚያ ማኅተሚያ ቤቅጣት ለተኮረ ተማሪዎች ለመግባት የሚያገለግል ማስፈጸሚያ ቤቅጣት የሆኑ ሁሉንም ተማሪዎች ለማወቅና ለመረጃ ማግኘት ተኮረ ተማሪዎች የሚያገለግሉትን ማስፈጸሚያ ቤቅጣት ለማወቅ የተዘጋጀ መጠይቅ፡

ክፍል 1: ስለ ማህበራዊ ሁኔታ መረጃ

ተ.ቁ	ጥያቄዎች	መልስ (ለሆኑ የሚሉት ዝርዝር)
101	ዕድሜዎ ስንት ነው?	1. 18-25 ዓመት (ዕድሜ በመሆኑ ዓመት ይገለጹ)
102	ፆታ	1. ወንድ 2. ሴት
103	ብሔርዎት ምንድነው?	1. ሲዳማ 6. ክምበታ 2. ወለዶታ 7. ሃዲያ 3. ጋሞ 8. ጉራጊ 4. አማራ 9. አርጥ 5. ጊዶ 10. ሌላ ካለ ይጠቃስ.....
104	አይማኖትዎት ምንድነው?	1. ቸር-ክስታንት 2. አርቶዎስ 3. ሙስልም 4. ካቶልክ 5. ሌላ ካለ ይገለጹ.....
105	ባለሁኑ መቆን የጋብቻ ሁኔታዎ እንዴት ነው?	1. የገቡ 2. ያላገቡ 3. ባል/ምስት የሞተበት/የሞችበት 4. ቢጋደኝነት ያሉ 5. የተፋፋይ/ተለያዩ
106	የገቡ ወይም ቢጋደኝነት ያሉ ከሆነ ለምን ያህል ጊዜ ለብረው ይረዳል?	6..... ዓመት፣ ወራት
107	ከፍተኛው የትምህርት ደረጃዎ ምንድነው?	1. ማኅበብና መጻፍ የማይችል 2. 1-4 ክፍል 3. 5-8 ክፍል 4. 9-10 ክፍል 5. 11-12 ክፍል 6. ኮሌጅ ወይም ዩኒቨርሲቲ 7. ሌላ ከገን ይገለጹ.....

ክፍል 4: የተጠቃሚ የጾታ ጥንድ/የጥንድ ጥያቄ ሁኔታ

121	ከጾታ ጥንድ/የጥንድ ጥያቄ ላይ ምን ያህል ጊዜ አብረው ቆይተዋል?	1. ወር (ጥቅም)
122	አቶ.አይ.ሸ ማይረስ በደምም ወሰጥ መኖሩን ለጾታ ጥንድ/የጥንድ ጥያቄ ጥራት ለውጥ ማድረግ ረዘመ?	1. አዎ 2. አልተገኘም
123	የጾታ ጥንድ/የጥንድ ጥያቄ ላይ አቶ.አይ.ሸ የደም ምርመራ አድርገዋል?	1. አዎ 2. አልተመረመረም/የም 3. አለመሆኑም
124	የአቶ.አይ.ሸ የደም ምርመራ ክፍያ ለማግኘት ወጪው ምን ነበር?	1. የገዛዬን 2. ሃይደብ 3. አለመሆኑም
125	የጾታ ጥንድ/የጥንድ ጥያቄ ላይ ለወደቁት ልጅ ለክፍያ ለውጥ ይፈልጋል/ትፈልጋለች?	1. አዎ 2. አይፈልግም 3. አለመሆኑም

ክፍል 5: ስለ በተሰጠ ምንጭ አጠቃቀም ምርመራ ዋና ዋና

126	አሁን በጥንቃቄ ወቅት የበተሰጠ ምንጭ አጠቃቀም ይጠቀማሉ?	1. አዎ 2. አልጠቀምም 3. አለመሆኑም 4. መልስ የለም 5. ሌላ ካለ ይገለጹ.....
127	ለጥያቄ ቆይታ 126 መልሱ 'አዎ' ከሆነ የጥንቃቄ የወላጅ መቆጣጠሪያ ነው የምጠቀመውት? (ከአንድ በላይ መልስ ልጥር ይቻላል)	1. የወላጅ መቆጣጠሪያ አንቅስብሎ 2. በመርፈ የምሰጥ የወላጅ መቆጣጠሪያ 3. በግንባታ የምገባ የወላጅ መቆጣጠሪያ 4. በኮንድ የምቀበር የወላጅ መቆጣጠሪያ 5. መታቀብ 6. ኮንዶም 7. ጥምር የወላጅ መቆጣጠሪያ (ኮንዶም ሊሆን ይችላል) 8. ማስቆጠር (ግንባታ/ዘር ጥሬ መተላለፍ ቅጠ) 9. ሌላ ካለ ይገለጹ.....

128	አሁን በጥናቱ ወቅት የያዙ ጥንድ/የትዳር ገዢዎች የቤተሰብ ምክንያት አገልግሎት እየተጠቀሙ ነዉ?	<ol style="list-style-type: none"> 1. አዎ 2. አይጠቀምም 3. አላዉቅም 4. መልስ የለም 5. ሌላ ካለ ይገለጹ.....
129	ለጥያቄ ቁጥር 128 መልሱ አዎ ከሆነ፣ የትኛውን የወሊድ መቆጣጠሪያ ነዉ የምትጠቀሙ/የምትጠቀሙዉ (ከአንድ በላይ መልስ ልግር ይችላል)?	<ol style="list-style-type: none"> 1. የወሊድ መቆጣጠሪያ እንክብካቤ 2. በመርፈ የምስጢ የወሊድ መቆጣጠሪያ 3. በማህበን የምገባ የወሊድ መቆጣጠሪያ 4. በክንድ የምቀበር የወሊድ መቆጣጠሪያ 5. መታቀብ 6. ኮንዶም 7. ጥምር የወሊድ መቆጣጠሪያ (ኮንዶምና ሌሎች) 8. ማስቆጠር (ማህፀን/ዘር ጥሬ መተላለፍ ተቦ) 9. ሌላ ካለ ይገለጹ.....

ክፍል 6: የኤች.ኤይ.ቪ ቫይረስ ብድረ ማሻሻያ ወይን የምገኝባቸዉ ሰዎች የመወለድ ፍላጎት (የመወለድ ዕቅድና ለመወለድ ወይም ላለመወለድ የወሰዱት እርምጃ

130	ወደፍት ልጅ እንድትገኙት ይፈልጋሉ/ወደፍት የመወለድ ፍላጎት አለብኝ ?	<ol style="list-style-type: none"> 1. አዎ 2. አልፈልግም 3. አላዉቅም 4. መልስ የለም 5. ሌላ ካለ ይገለጹ.....
131	ለጥያቄ ቁጥር 128 መልሱ አዎ ከሆነ፣ ለምን ወይን ልጅ እንድትገኙት ፈለጉ/ወደፍት ለመወለድ ለምን ፈለጉ?	<ol style="list-style-type: none"> 1. ከዝህ በፍት ልጅ ስለሌለኝ 2. ልጅ-አልባ እንዳልባል 3. ወላጅ መሆን አስፈላጊ ስለሆነ 4. የወሊድ መቆጣጠሪያ ማግኘት ስለማልቻል 5. ምትዳር አጋሪ/የጥምር ገዢዎች ስለሆኑ 6. ጤናዬ ስለተመለሰ/ጥሩ የጤና ደረጃ ላይ ስለሆኑ 7. ፀረ-ኤች.ኤይ.ቪ ህክምና/መድኃኒት ከሸረሰ ነፃ የሆነ ልጅ ለመወለድ ስለምያስቸለኝ 8. ሌላ ካለ ይገለጹ.....

132	ለጥያቄ ቁጥር ሙሉ ለልጋራ ስም ከሆነ፣ ለምን ወይም ለሙሉ ስም ለልጋራ ስም?	<ol style="list-style-type: none"> 1. የኢ-ገቢዎች ክፍል ከገጥሞ ወይ ልጅ ሙሉ ስም ፈርዶ 2. በዩ ደጃቸው ስሌት 3. የገቢ ክፍል አጋራ/ገቢ ገንዘብ ስሌት 4. ልጅ የሚሰጥበት በዩ ገቢ ስሌት 5. ገቢ እንዲቆይ 6. የገቢ ባለሙያ ልጅ ሙሉ ስም አንድራሻ ስም 7. ሙሉ ስም 8. ሌላ ካለ ይጻፍ.....
133	ለጥያቄ ቁጥር 130 ሙሉ ስም ከሆነ ለወይም ለገቢ ስም ለልጋራ ስም ትወልዳለህ/ለሙሉ ስም ትቆይሃለህ?	<ol style="list-style-type: none"> 1. 1 2. 2 3. 3 4. ከሌላው በላይ
134	ልጅ ለሙሉ ስም/ለገቢ ስም ከተቆይ/አልገባም ለሙሉ ስም ይደረገው ጥሪት ምን ይሆናል?	<ol style="list-style-type: none"> 1. የገቢ አጋራ/ገቢ ገንዘብ ነገር 2. የገቢ አጋራ/ገቢ ገንዘብ አወጣጥ/አገልግሎት 3. የገቢ ባለሙያ አጋራ/ገቢ ገንዘብ 4. የወላጅ ሙሉ ስም ለሙሉ ስም አወጣጥ 5. አርጎን ነፃ 6. ሌላ ካለ ይጻፍ.....
135	ልጅ ለሙሉ ስም/ለገቢ ስም ከተቆይ/አልገባም ለሙሉ ስም ይደረገው ጥሪት አይደለም ምን ይሆናል?	<ol style="list-style-type: none"> 1. የወላጅ ሙሉ ስም ለሙሉ ስም አወጣጥ 2. የገቢ አጋራ/ገቢ ገንዘብ የወላጅ ሙሉ ስም ለሙሉ ስም አወጣጥ 3. የወላጅ ሙሉ ስም ለሙሉ ስም ለሙሉ ስም አወጣጥ 4. ሌላ ካለ ይጻፍ.....