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Women's Socio-Economic Empowerment and Uptake of HIV Testing in Ethiopia

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Women's Socio-Economic Empowerment and Uptake of HIV Testing in Ethiopia

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Dedication

To my mother, Zenebech Bekele, and all the women in the world who have given so much but received so little in return!

Acknowledgments

This dissertation would not have been possible without the help of the following individuals. First and foremost, I would like to extend the utmost gratitude to my advisor, Dr. Donaldson Conserve, for his constructive feedback since the inception of the dissertation project and support throughout my doctoral program. Thank you for being the person I can lean on during the tough times! To Dr. DeAnne K. Hilfinger Messias, thank you for letting me see women's work from another perspective and for your feedback throughout the writing process. It would have been impossible without you. To Dr. Shan Qiao and Dr. Juliet Iwelunmor, thank you for providing your input in the manuscripts. To Dr. Zelalem Haile, thank you for helping me with the analysis. Finally, I would like to thank my entire family for their continued support throughout my doctoral work.

Abstract

Introduction: Sub-Saharan Africa constitute two-thirds of all people living with HIV in the world. HIV infection rate is high in the continent with women comprising 56% of new HIV infections among adults 15 and older. Women 15 to 24 are the most affected constituting 66 % of new infections occurring among this age group. The purpose of this study was to examine how gender power relations between men and women affect health seeking behavior, particularly HIV testing, among Ethiopian women age 15 to 49.

Methods: The Ethiopian Demographic and Health Survey (EDHS) from 2016 served as the data source for this study. The EDHS sample was determined using a two-stage stratified cluster sampling design. Participants included 12, 688 Ethiopian men between the ages of 15 and 59 and 15,683 Ethiopian women between the ages of 15 and 49. The sub-sample for this dissertation study consisted of all currently married women within the EDHS sample. Kabeer's theoretical framework and Anderson's Behavioral Model guided variable selection. The outcome variable, "ever being tested for HIV," was assessed using a bivariate analysis and multivariate logistic regression. Participants with missing data on questions related to decision making, emotional violence and other covariates adjusted in the multiple logistic regression were excluded from the analysis. Sampling weights that accounted for complex survey design were incorporated in all analyses.

Results: Several indicators of women's empowerment were associated with HIV testing among women. After adjusting for covariates, socio-economic status, health care decision

making, household decision making, and media exposure independently predicted HIV testing uptake. Women currently employed, those with better education, who participated in household decision making and decision making related to their own health care, and who reported higher exposure to the media were more likely to have been tested for HIV. Having experienced emotional violence by an intimate partner did not independently predict HIV testing uptake.

Conclusion: This research is the first of its kind to explore the association of aspects of women's empowerment with HIV testing in Ethiopia, using a national sample. The results indicated the importance of socio-economic status, media exposure, participation in household decision making, and health care decision making in Ethiopian women's uptake of HIV testing. These findings are relevant for those who design programs and policies related to promoting uptake of HIV testing among women, particularly in Sub-Saharan Africa.

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Chapter 1

Introduction

Sub-Saharan Africa constitutes two-thirds of all people living with HIV (PLWH) in the world, followed by Asia and the Pacific (Kaiser Family Foundation, 2016). There is a regional disparity in HIV prevalence in the region. Eastern and southern Africa is home to 53% of all people living with HIV and account for two-thirds of all children living with the virus (67%). In contrast, HIV is less prevalent in west and central Africa, where there are currently 6.1 million people living with HIV (Avert, 2017). Two countries in this sub-region are particularly worth mentioning: South Africa and Eswatini (formerly known as Swaziland). Although South Africa has the highest number of PLWH in the world (7.2 million), Eswatini has the highest prevalence of HIV in the world (Kaiser Family Foundation, 2016).

In Sub-Saharan Africa, women comprise 56% of new HIV infections among adults 15 and older (Department of Economic and Social Affairs, 2010). Women 15 to 24 years old are the most affected; about 66 percent of new infections occur among this age group (Department of Economic and Social Affairs, 2010) The high proportion of infection among African women also reflects global prevalence, with women constituting 51% of all adults living with HIV in 2015 (Department of Economic and Social Affairs, 2010). In Sub-Saharan Africa, women's vulnerability to HIV infection primarily arises from their low social position in society that can be attributed to multiple structural, social and biological factors (Dellar, Dlamini, & Karim, 2015).

Prior research has identified gender and sexuality as significant factors in the sexual transmission of HIV, treatment, care and support (Gupta, 2000). Of note, gender and sex are distinct. “Sex describes a biological distinction between men and women, gender is a social construct that differentiates the power, roles, responsibilities, and obligations of women from that of men in society ”(Türmen, 2003, p. 411). As a culturally specific construct, there are significant differences in what men and women can or cannot do across different cultures (Gupta, 2000). However, a consistency across cultures is that there are distinct differences between women’s and men’s roles, access to productive assets, and decision-making authority (Gupta, 2000). Whereas men are responsible for the productive activities outside the home, women are confined to the domestic sphere with both productive and reproductive roles (Gupta, 2000). Furthermore, women have less access and control over productive resources such as education, land, and credit (Gupta, 2000). Although closely linked, sexuality is distinct from gender and is considered as the social construction of a biological drive. In other words, an individual’s sexuality defines with whom one has sex with, why, in what ways, under what circumstances and with what outcome. It is the result of rules (implicit and explicit) imposed by society and can be defined by one’s age, gender, economic status, and ethnicity (Gupta, 2000).

Both gender and sexuality are fundamentally associated with power differentials and relationships between men and women. The type of power relations that exist between two partners also determine whose pleasure deserves priority, when, how and with whom. (Gupta, 2000). In this case, the unequal power balance that favors men over women translates into unequal heterosexual relations (Gupta, 2000). As a result, male sexual pleasure supersedes that of his female partner and men have greater control than women

over when, where and how sex takes place (Gupta, 2000). HIV-related risks are the greatest in situations where women are conditioned to please men and submit to male authority (Mane & Aggleton, 2001). Most importantly, women's inability to negotiate sex, their social and economic dependence on men, their lower status in family and social structures, and their traditional roles as nurturers and caregivers make it difficult for many women to protect themselves from acquiring HIV. Exacerbating this risk are harmful traditional practices such as female virginity testing, wife inheritance, violence, rape, and female genital mutilation (Mane & Aggleton, 2001).

This study explored how gender power relations affect health seeking behavior of women. More specifically, the study investigated the association between socio-economic empowerment and HIV testing among Ethiopian women aged 15 to 49. Given that the literature on women's empowerment has predominantly focused on assessing the link between women's empowerment and child health/maternal health outcomes (Pratley, 2016), this study makes a contribution to the state of the science on HIV in sub-Saharan Africa by assessing associations between empowerment and HIV testing uptake among Ethiopian women.

Specific Aims

The following five specific aims guided the research.

Aim 1

To examine the associations between socio-demographic variables (e.g., age, educational level, occupation, household income, urban or rural residence) and uptake of HIV testing among Ethiopian women of reproductive age.

Hypothesis

Ethiopian women with higher socio-economic standing, as indicated by household income, occupation, education and urban residence, will be more likely to have been tested for HIV than those with lower socio-economic standing (e.g., rural residency, lower educational level, engaged in informal labor force).

Aim 2

To assess the association between Ethiopian women's household decision making autonomy and their uptake of HIV testing.

Hypothesis

Ethiopian women who participate in household decisions will be more likely to have been tested for HIV than those who do not.

Aim 3

To assess the association between personal health care decision making autonomy and uptake of HIV testing among Ethiopian women.

Hypothesis

Compared to Ethiopian women who do not participate in their own personal health care decisions, women who do participate in personal health care decisions will be more likely to have been tested for HIV.

Aim 4

To assess the association between media exposure (e.g., reading newspapers or magazines, listening to radio or watching TV) and HIV testing among Ethiopian women.

Hypothesis

Compared to those who have limited or no media exposure, women who have exposure to the media at least once a week are more likely to have been tested for HIV.

Aim 5

To assess the association between self-reported incidence of gender-based violence and HIV testing among Ethiopian women.

Hypothesis

Compared to those who had no reported personal exposure to emotional violence, Ethiopian women who reported prior personal exposure to some form of violence are less likely to have been tested for HIV.

Significance

This research contributes to the broader field of international public health by being one of the first studies to explore the association between socio-economic empowerment of women and HIV testing uptake using a nationally representative sample. Compared to African men, given the higher prevalence of HIV among African women, this research will contribute to elucidating the gender dynamics in the HIV seeking behavior of African women by identifying the socio-demographic characteristics and most relevant aspects of women's decision-making regarding uptake of HIV testing. Findings from this study will

be useful for policy makers and practitioners who aim to expand HIV testing among women.

Overview

This dissertation is organized as follows: In Chapter 2, Background and Significance, I synthesize the literature on women's empowerment and HIV testing to justify the importance of conducting the study. In Chapter 3, Methods, I detail the methodology used for this research. In Chapter 4, Results, I present the study findings in the format of two academic manuscripts entitled "Health Care Decision Making and HIV Testing among Ethiopian Women: Results from the 2016 Ethiopian Demographic and Health Survey" and "Associations between intimate partner violence, HIV serostatus, and HIV testing uptake among Ethiopian women: Results from a population-based analysis" prepared for submission to *Health Care for Women International*. In Chapter 5, Conclusions and implications, I summarize the results of this study and discuss the implications for further research and public health practice.

Chapter 2

Background and Significance

In this chapter, I review the literature on women in sub-Saharan Africa, examining factors driving the HIV epidemic among women in the continent, HIV diagnosis and testing, enablers of HIV testing in sub-Saharan Africa, barriers to HIV testing in sub-Saharan Africa, HIV in Ethiopia and the literature on HIV testing, what empowerment is and key challenges in measuring empowerment. In concluding the chapter, I present the significance of the study and describe preparation to conduct this research and implications of the research for my academic career.

Women in Sub-Saharan Africa

Women in Africa bear a disproportionately large share of the global burden of disease (WHO, 2010). They are particularly affected by maternal morbidity and mortality (WHO, 2010). African women have a 1 in 42 lifetime risk of dying during childbirth compared to a 1 in 2900 lifetime risk among European women (WHO, 2010). As a result, Africa accounts for more than half of all cases of maternal deaths worldwide (WHO, UNICEF, 2010).

Sub-Saharan Africa is also the epicenter of HIV, accounting for 70 % of all new HIV infections worldwide (Kharsany & Karim, 2016). Out of the 15% of women age 15 to 24 living with HIV globally, 80% live in sub-Saharan Africa. Young women in this age group have higher rates of HIV and get infected 5 to 7 years earlier than their male peers

(Kharsany & Karim, 2016). Despite the declining trend in HIV infection, the gender disparity in HIV prevalence is persistent in this age group across eastern and southern Africa (Kharsany & Karim, 2016). Factors driving the HIV epidemic among women in Africa include low levels of formal education, economic poverty, social and cultural norms regarding sexuality and sexual activity, biological factors related to HIV transmission, gender norms, and exposure to family violence (Türmen, 2003).

Factors driving the HIV epidemic among African women

The literature has identified several factors that drive the HIV epidemic among women in Africa. The main ones include lack of formal education, economic poverty, social and cultural norms of virginity, biological factors, gender norms, and domestic and gender-based violence. In this section, I will briefly discuss each one of them.

Lack of education

Although education is a human right that helps individuals reach their full potential, most boys and girls in Africa are not in school. Sub-Saharan Africa has the lowest percentage of female youth literacy, the lowest primary school enrollment ratio and the lowest primary school attendance ratio in the world (Department of Economic and Social Affairs, 2010). Compared to 52% of South Asian girls who attend secondary school, in sub-Saharan Africa the rate is only 22% (WHO, 2010). According to a recent report, gender parity in school enrollment has not been achieved in sub-Saharan Africa, which accounts for 47% of out of school children worldwide, of which 54% are girls (FAWE, 2017). Furthermore, female students constitute less than two-fifths of the population in tertiary

education in sub-Saharan Africa, with only 38% of females having enrolled in tertiary education in 2005 (FAWE, 2017).

There are several plausible explanations for women's lack of educational attainment. Starting at an early age, girls face the challenges that will distinguish them from their male peers for the rest of their lives (FAWE, 2017). In many places, as soon as they are physically capable, girl children are assigned to household chores, including cooking, cleaning, washing, fetching water and collecting firewood; as well as tasks outside of the home such as going to market to sell or trade food and goods (WHO, 2010).

Girls are excluded from school systems for numerous social, financial, and environmental reasons (Rafferty, 2013). Some families may lack the financial capability to send girls to school. Others may decide to commit the meagre resources they have to the education of the son in the household. School environments that do not accommodate the physical needs of girls are also a deterrent (WHO, 2010). For instance, absence of toilet facilities specifically designed for females are a clear deterrent to girls' attending schools in many parts of Africa (WHO, 2010).

Despite the limited access to education among young people in Africa, the importance of education is not generally contested. Schooling increases individuals' self-efficacy and locus of control, as well as the ability to solve problems and process information (FAWE, 2017). Education also increases human capital, agency and a sense of personal control (Pampel, Krueger, & Denney, 2010). More specifically, education increases women's capacity to question, to reflect on, and to act on the conditions of their life circumstances. Education is also associated with a change in power relationships within and outside of the household (Kabeer, 2005). Compared to uneducated women,

educated women are also less likely to suffer from domestic violence and are more likely to use family planning, and to look after their own wellbeing as well as the wellbeing of their family (Kabeer, 2005).

In terms of health, there is an inverse association between educational level and the burden of infectious disease (Vandemoortele & Delamonica, 2014). Although in the early days of the African HIV epidemic people with higher education were more susceptible to HIV, the trend has changed since the mid 1990's (Gregson, Waddell, & Chandiwana, 2001). Contributing factors include more highly educated individuals being more likely to delay their first sexual encounter, have fewer sexual partners, and engage in increased condom use (Vandemoortele & Delamonica, 2014). Of note, between 1994 and 1998 in Zambia, HIV prevalence fell, with the strongest decline observed among younger educated women (Gregson et al., 2001). Similarly, in Uganda the largest decline in HIV incidence between 1995 and 1997 was observed among younger women and women with secondary education (Gregson et al., 2001).

Poverty

The inequalities in access to educational opportunities limit girls' opportunities within the formal labor market (WHO, 2010). As a result, women tend to be employed in the informal sector, including domestic work, which provides limited economic benefits, protection, and social support (Erulkar & Ab Mekbib, 2007). Girls engaged in domestic employment may spend up to 15 hours on the job (Erulkar & Ab Mekbib, 2007). They often face several physical, psychological and sexual abuse in their work environment. Besides physical injuries, many girls who engage in domestic work are victims of sexual

abuse, sexual assault and rape from employers and extended members of the household (Rafferty, 2013), contributing to an increased risk for HIV.

Limited income also compels women to seek alternative means to sustain their livelihoods, including exchanging sex for money. A recent study in Rwanda showed how the rising cost of education may contribute to uptake of transactional sex among young girls (Berry, 2015). Rather than dropping out of school, some young women turn to “sugar daddies” (i.e., older men who willingly pay for their school fees or other costs), to ensure their ability to continue their education. Furthermore, some young women reported they considered having a sugar daddy to be a status symbol. Of concern is the fact that in Rwanda, women have a 68% higher HIV infection rate than men (Berry, 2015).

In some urban areas of Africa, it is common for women form stable unions with several male partners, with each one contributing in some way to the maintenance of the family (Heise & Elias, 1995). Although the primary motive is economic, these relationships may and often do involve mutual affection. For example, a woman may have sexual relations with several long-distance truck drivers whom she sees on occasion when they pass through town (Heise & Elias, 1995). In return, these men may help the woman in paying school fees for her children or assist by buying groceries for the household (Heise & Elias, 1995).

Poverty also contributes to disparities in information access (Türmen, 2003). Research shows that both women and men of higher economic status know more about HIV prevention than those who are poor, a phenomenon that is similar across many countries where data is available (Türmen, 2003). Poverty also may contribute to women’s migration, motivating them to move in search of more favorable economic conditions and

opportunities (Türmen, 2003). However, Türmen (2003) noted that migrant women face increased risk of HIV infection associated with both sexual encounter for economic reasons and coerced sex.

Social and cultural norms of virginity

Across most cultures, there is a high value on maintaining girls' virginity until marriage (Weiss, Whelan, & Gupta, 2000). In some societies, the social pressure to remain a virgin may contribute to young women's risk of HIV infection and act as a barrier to their adoption of preventive behaviors. Some girls proactively adopt alternative sexual practices, such as anal sex, to protect both their virginity and prevent conception (Weiss et al., 2000). They may also adopt what they call "light sex," rubbing the penis against the vagina and penetration up to the point of pain, in order to avoid the pain and bleeding that comes with the loss of virginity (Weiss et al., 2000).

Most cultures have rules requiring women to have little or no pre-marital sexual experience (Buvé, Bishikwabo-Nsarhaza, & Mutangadura, 2002). As a result, young women face considerable social pressure to maintain an image of innocence, regardless of the true extent of their sexual knowledge or experience (Weiss et al., 2000). A girl's demonstration of knowledge about sex may be interpreted to mean she has been sexually active, and as a result she may risk being stigmatized (Weiss et al., 2000). Due to such social and cultural norms and pressures, women may be reluctant to take precautions against sexually transmitted infections including HIV (Weiss et al., 2000).

The emphasis on virginity also has a negative impact on health care access among young women (Berry, 2015). In parts of Africa, an unmarried girl is expected to act like a

timid virgin and does not have the rights that come with adulthood such as independence or control over her fertility (Burnet, 2007). Thus, a girl's social identity, regardless of her age, is tied to her father or brothers and she is denied full participation in society as an adult until she gets married (Burnet, 2007). For instance, although Rwanda's national health care program grants access to low cost or free family planning services for women of reproductive age, in practice, many young, unmarried women avoid using the service because of the social value placed on women's honor and virginity (Berry, 2015).

Biological factors

In part, the high incidence of HIV among adolescent girls in Africa may be attributed to biological factors. Research suggests that male to female HIV transmission is between two to four times more efficient than female to male (Türmen, 2003). Many young women are infected after only a few sexual encounters. The higher rate of infection among younger women, as compared to men, may be attributed to immature genital tract that sustains tears during sexual activity (Türmen, 2003). HIV acquisition may also be facilitated by the presence of other STIs. A recent South African study demonstrated that herpes simplex virus -2 (HSV-2) acquisition among young women was associated with increased vulnerability to HIV (Dellar et al., 2015).

Gender norms

In most societies, dominant gender constructions and ideologies inform the social norms for boys and girls as well as men and women (Gupta, 2000). Dominant gender norms of masculinity reflect the expectation that men are to be knowledgeable and experienced about sex (Gupta, 2000). This expectation may place young men at higher risk

of HIV infection if it prevents them from actively seeking sexual health information or admitting their lack of knowledge about sex or protection (Gupta, 2000). Although adults actively seek to ensure adolescent girls avoid contact with boys and remain virgins, adolescent boys encounter few social restrictions regarding their personal sexual behavior (Weiss et al., 2000). Adolescent males may be encouraged to use their teenage years as a time to experiment their sexuality, given the belief that sex is necessary for their mental and physical wellbeing (Weiss et al., 2000). Worldwide, the dominant belief that variety in sexual partners is an essential component of being male contributes to widespread tolerance of men who seek multiple partners for sexual release (Gupta, 2000).

In many parts of the world, early marriage is a culturally sanctioned practice. Girls are forced into arranged marriage by their families and communities. The prevalence of early marriage remains high in Southern Asia and Sub-Saharan Africa. In sub-Saharan Africa, 40% of women age 20 to 24 were married before they turned 18 and 12% before age 15 (United Nations, 2015). In some parts of Africa, girls marry as early as age 12. Findings from research conducted in the Amhara region of Ethiopia indicated the mean age at first marriage for women to be 14.5 in 2005 (Pathfinder, 2006). Furthermore, 44% of urban and 53% of rural ever-married women in the region were first married between the ages of 12 and 15 years (Pathfinder, 2006).

Predominant cultural narratives are major drivers of early marriage. Although some families may marry their daughters to protect them from the risk of abduction or rape, for others it is a means of increasing the family income and ensuring family survival (Rafferty, 2013). In some parts of Ethiopia, the most important reason for the practice of early marriage is to maintain the family name in the community, which is closely related to the

success of children. A daughter's "timely" (i.e., early) marriage is encouraged because of traditional concerns that a girl will become too old for marriage after a certain age, which would represent a failure on the part of her parents (Pathfinder, 2006).

From a life course perspective, women pay a significant price for marrying early in life, as reflected in the concept of the sensitive period. "A sensitive period refers to a development window of time when exposure to a given event or experience exerts a stronger effect than it would if it occurred during a different developmental period" (Walsemann, Goosby, & Farr, 2016, p.2). As such, besides limiting opportunities for schooling, economic gains, and personal freedom, early marriage increases women's exposure to violence and HIV (Rafferty, 2013).

Compared to older women, young women are especially prone to infection due to trauma to their immature genital tract during sex (Türmen, 2003). Research conducted among young people in Rwanda demonstrated that having sex at an early age (defined as 17 years of age or younger) was significantly associated with a higher incidence of HIV infection (Pettifor, van der Straten, Dunbar, Shiboski, & Padian, 2004a). Furthermore, given that young girls tend to marry older men (on average 10 years older than them), they often have limited decision-making power about sex.

Domestic and Gender-Based Violence and HIV

Family violence, also referred to as "domestic or interpersonal violence, is defined as any combination of physical, emotional, and sexual abuse between any family members or intimate partners who may or may not be living together (Fuentes, 2008). Nearly one third of women worldwide have experienced physical and or sexual violence by an intimate

partner or non-intimate partner at some point in their lives (United Nations, 2015). Intimate partner violence is the most common form of violence throughout the world and is often at its peak during women's reproductive years (United Nations, 2015). Available data shows that physical violence is the highest in Africa (United Nations, 2015). WHO research that analyzed data from two predominantly rural areas in the Southern Nations Nationalities and People's Region of Ethiopia indicated 71% of women had suffered physical or sexual violence by a male partner (Pathfinder, 2006).

Many young African women have little choice in delaying their sexual debut. The unequal gender power relation between men and women make women unable to refuse unwanted sexual advances, and when they have sex, women have limited control over condom use (Pettifor, van der Straten, Dunbar, Shiboski, & Padian, 2004b). Furthermore, since gender often operates through an unquestioning acceptance of male power, women may acquiesce to violence at the hands of their husbands do so because to behave otherwise is considered outside the norm (Kabeer, 2005).

Violence against women fuels HIV risk through multiple pathways. Foremost, violence may increase a woman's risk for HIV infection through forced or coerced sex and by limiting her ability to negotiate HIV prevention behaviors (WHO, 2010). Furthermore, physical and sexual abuse during childhood has been associated with high risk-taking behavior in adolescence and adulthood (Suzanne Maman, Campbell, Sweat, & Gielen, 2000). Notably, studies have shown that women who were sexually abused as children tend to be depressed, and demonstrate affection-seeking behaviors that increases their sexual risk (Fuentes, 2008). Other researchers have noted the association between child sexual assault and the likelihood of engaging sex for money or drugs (Dunkle et al., 2004b). The

threat of violence also affects women's power and ability to negotiate the conditions of sexual intercourse, especially condom use (World Health Organization, 2003). Despite knowing the social and biological factors that put women at risk for HIV, HIV testing is the gateway to treatment, care and prevention of the disease (Obermeyer & Osborn, 2007) and with that realization many countries in sub-sahran Africa have scaled up HIV testing services in recent years (Musheke et al., 2013).

HIV Diagnosis and Testing

HIV testing is the first step in maintaining a healthy lifestyle and reducing the spread of HIV (CDC, 2018). Unfortunately, nearly 40% of HIV transmission occurs through people who do not know their HIV status (CDC, 2018). HIV positive individuals who are aware of their status can get HIV treatment in the form of antiretroviral therapy (ART) and lead a healthy life. ART treatment reduces HIV-related illness, lowers the level of HIV in the blood and lowers the risk of transmission to others (CDC, 2018). HIV positive individuals on ART who keep undetectable viral load have no risk of sexually transmitting HIV to an HIV-negative partner (CDC, 2018).

HIV can be diagnosed in three ways; HIV antibody test, antigen/antibody test, and Nucleic Acid Test (NAT)(CDC, 2018). The HIV antibody test detects the presence of antibodies, the proteins that a person's body makes to counter the HIV virus. Most home tests and rapid tests are antibody tests. The second type of test is called the antigen/antibody test. This detects both HIV antigen and antibody. Antigens are foreign substances that activate the immune system. People infected with HIV develop an antigen called P24 even before antibodies develop. For HIV tests conducted in laboratory settings, the antigen/antibody test is recommended. The third diagnostic test is called Nucleic Acid Test

(NAT) (CDC, 2018). This test looks for the actual virus in the blood. Since this test is quite expensive, it is not routinely used for HIV screening (CDC, 2018). Therefore, an initial HIV test will either be an antibody test or an antigen/antibody test.

In resource limited settings such as sub-Saharan Africa, HIV rapid diagnostic tests (RDT) are the main diagnostic tool used for HIV screening. Being simple and fast, they require minimum equipment and provide test results usually within 20 minutes. The majority of RDTs involve few manipulations steps, can be stored at ambient temperature, and can be read visually (Kosack et al., 2017). Despite the increasingly wider provision of HIV testing in recent years, however, studies show that the median percentage of people who know their status is below 40 percent (Musheke et al., 2013).

In Africa, both the lack of human and physical resources and the dysfunctional healthcare systems contribute to lack of availability and access to HIV testing (WHO, 2010). Lack of adequate funding, lack of trained human resources and inadequate infrastructure are some of the chronic problems of the system. The existing hierarchical system, and reliance on out of pocket payment for health care services is also an obstacle. Furthermore, whereas women in rural communities must travel long distances to access care, those in large cities have to wait long hours to receive care in crowded facilities (WHO, 2010). Besides a dysfunctional health care system at a macro level, researchers have identified other enablers and deterrents of HIV testing in sub-Saharan Africa, addressed in the following sections.

Enablers of HIV testing in sub-Saharan Africa

Prior research has identified several factors that may promote uptake of HIV testing in Sub-Saharan Africa (Musheke et al., 2013). For example, physical deterioration, poor health status, and death of sexual partner or a child may contribute to individuals' elevated HIV risk perception and subsequent decision to seek HIV testing (Chirawu et al., 2010). Individuals are also more likely to test for HIV if they know someone who died of HIV/AIDS (Castle, 2003). Other factors that may increase perceived risk, and contribute to HIV testing, include earlier experience of a sexually transmitted disease, perceived partner unfaithfulness, and having had multiple sexual partners (Musheke et al., 2013). The availability of ART and the expansion of Prevention of Mother-to-Child Transmission of HIV (PMTCT) services has also increased HIV testing uptake (Musheke et al., 2013).

Social and organizational factors have also played a role in the uptake of HIV testing in Sub-Saharan Africa. In some parts of Africa, HIV testing was taken as a prerequisite for marriage (Meiberg, Bos, Onya, & Schaalma, 2008). Some churches have played an active role by integrating HIV testing with the marriage process (Luginaah, Yiridoe, & Taabazuing, 2005). The introduction of new HIV testing initiatives has expanded testing opportunities for individuals coming to clinics (Musheke et al., 2013). For instance, the "opt-out" provider-initiated HIV testing was particularly important in increasing HIV testing among patient coming to clinics. Likewise, HIV testing outreach services encouraged more people to test by attenuating travel costs, wait times and confidentiality issues that are deterrents of HIV testing in facility-based settings (Musheke et al., 2013). Finally, perceived social support also played a significant role in people's decision to test (Musheke et al., 2013).

Barriers to HIV testing in Sub-Saharan Africa

Despite the various incentives to HIV testing in Sub-Saharan Africa, there are several factors that may inhibit individuals from seeking HIV testing. Low risk perception is the primary barrier, and may manifest itself in different ways (Obermeyer & Osborn, 2007). Individuals who abstained from sex or lack sexual partners often perceive themselves to be at low risk and do not recognize the need for HIV testing (Mabunda, 2006). Proxy testing or adopting the status of a sexual partner, may also negatively affect HIV testing uptake (Musheke et al., 2013). Individuals who trust their sexual partners and believe they are at low risk, those who have never had direct contact with individuals who live with HIV or have died of AIDS, and those who think HIV is a problem of sex workers are also less likely to test for HIV (Musheke et al., 2013).

Societal attitude towards the disease, relationship dynamics and fear of social exclusion play a role in HIV testing uptake (Obermeyer & Osborn, 2007). In sub-Saharan Africa, being seen at HIV testing centers is associated with having HIV or sexual promiscuity (Larsson et al., 2010), and this association discourages individuals from seeking HIV testing. Another more recent form of social stigma targeting people on ART also contributes to lower uptake of HIV testing. This new form of stigma is targeted towards people on ART who are presumed to spread HIV due to their longevity (Roura et al., 2009). Factors contributing to avoiding HIV testing include fear of losing a sexual partner and fear of straining marital relationships and possible subsequent abandonment, violence and divorce (Musheke et al., 2013). The desire to marry also may influence an individual's decision to test because of the notion that an HIV positive diagnosis will preclude the person from finding a life partner (Musheke et al., 2013).

Gender power dynamics also contribute to determining HIV testing uptake in sub-Saharan Africa (S. Maman, Mbwambo, Hogan, Kilonzo, & Sweat, 2001). Whereas men exercise their personal decision-making autonomy related to getting tested, women often must seek permission from their husband/partner. In some instances, a wife's suggestion to be tested could be interpreted negatively by her husband if it is perceived to undermine his role as a decision maker in the household (Grant, Logie, Masura, Gorman, & Murray, 2008). Therefore, fear of partner's reaction may undermine a woman's decision to test and subsequently disclose her test results. Men may avoid HIV testing when it is perceived to go against the masculine norms of self-confidence, resilience and stoicism (Izugbara, Undie, Mudege, & Ezeh, 2009).

Individual perceptions about the health care system and conspiratorial beliefs about HIV also may adversely affect HIV testing uptake (Musheke et al., 2013). Lack of confidence in providers, perceived lack of confidentiality, perceived unreliability of test results and mistrust of HIV testing technologies may deter individuals from testing (Musheke et al., 2013). Inconvenient locations of HIV testing centers and men's perception of testing sites as feminized centers also negatively affect the effort to seek HIV testing (Musheke et al., 2013). The dissemination of other attitudes or beliefs, such as the notion that HIV is a western plot designed to subjugate Africans by either controlling the population growth or by creating a market for biomedical products also has contributed to resistance to take the HIV test to learn about one's status and to reluctance in admitting to having HIV (Castle, 2003). In some deeply religious communities, drawing blood for HIV test was equated to satanic motives and others believed HIV testing would lead the individual to spiritual darkness, plain loneliness and death (Frank, 2009).

The financial costs related to obtaining HIV testing and the perceived psychological burden of living with HIV are examples of other critical factors related to the decision to test for HIV (Musheke et al., 2013). Although HIV testing is free in many African communities, there are other indirect costs, such as transportation, and the opportunity cost of missing work, which also impact the decision to test. Regardless of the expansion of ART services in Africa, some people still consider an HIV diagnosis as a death sentence and try to avoid the mental distress that comes with it. This perception is more evident in areas where HIV treatment service is lacking (Musheke et al., 2013).

HIV in Ethiopia and the literature on HIV Testing

In 1993, the Federal HIV/AIDS Prevention and Control Office initiated an HIV/AIDS policy that aimed at integrating prevention, care and support in response to the HIV epidemic (Balcha, Lecerof, & Jeppsson, 2011). Ethiopia also joined the UN member states in June 2006 affirming a national commitment to minimize the spread of HIV by ensuring universal access to HIV prevention, treatment, care and support by 2010 (Balcha et al., 2011). The government's commitment was further solidified by the Federal HIV/AIDS Prevention and Control Office (FHAPCO), that renewed its effort to coordinate the fight against HIV/AIDS through shared vision and strategies (Balcha et al., 2011).

Currently, HIV prevalence in Ethiopia is low. Out of the estimated 73.8 million people, only 1.5% of the population age 15-49 live with HIV. However, women have a higher HIV prevalence rate (1.9%) than men (International, 2012). For both men and women, HIV prevalence increases substantially with the increase in the number of lifetime sexual partners (International, 2012). HIV prevalence is higher in urban areas (4.2%) than

in rural areas (0.6%). Among the different regions in Ethiopia, the Gambela region (6.5%) has the highest HIV prevalence, followed by Addis Ababa (5.2%) (International, 2012).

Most of the literature on HIV testing in Ethiopia has focused on clinical care settings. (Alemu, Ambaw, & Wilder-Smith, 2017; Ayenew, Leykun, Colebunders, & Deribew, 2010; Balcha et al., 2011; Bradley, Tsui, Kidanu, & Gillespie, 2011; Demissie, Deribew, & Abera, 2006; Deressa, Seme, Asefa, Teshome, & Enqusellassie, 2014; Facha, Kassahun, & Workicho, 2016; Fetene & Feleke, 2010; Jerene, Endale, & Lindtjørn, 2007; Testing & Initiation, 2010). Participants in the reviewed studies were either patients attending clinics to receive treatment for certain ailments (Balcha et al., 2011; Facha, Kassahun, & Workicho, 2016; Fetene & Feleke, 2010; Jerene, Endale, & Lindtjørn, 2007; Testing & Initiation, 2010) or were pregnant mothers attending antenatal care (Alemu, Ambaw, & Wilder-Smith, 2017; Demissie, Deribew, & Abera, 2006; Deressa, Seme, Asefa, Teshome, & Enqusellassie, 2014). Most of the studies assessed correlates of HIV testing from the perspective of HIV-related attitude, knowledge and behavior (Bradley, Tsui, Kidanu, & Gillespie, 2011; Demissie, Deribew, & Abera, 2006; Facha, Kassahun, & Workicho, 2016). Very few studies have focused on women, and those were conducted among pregnant women (Alemu, Ambaw, & Wilder-Smith, 2017; Demissie, Deribew, & Abera, 2006; Deressa, Seme, Asefa, Teshome, & Enqusellassie, 2014). None of these studies assessed the relationship between socio-economic empowerment and HIV testing among women.

What is Empowerment?

Models of power

There are four dominant forms of power cited in the literature: power within, power to, power with, and power over (Kabeer, 2005). The *power within* model recognizes that all power emanates from within the individual and this power cannot be superimposed by an external force (Rowlands, 1995). The assets of power within include self-esteem and self-worth and having those qualities help to counteract internalized feeling of worthlessness (Mosedale, 2005).

The other two models of power are *power to* and *power with* (Kabeer, 1999b). The former increases the boundaries of what is achievable for one person without necessarily limiting the boundaries for another party (Mosedale, 2005). This kind of power is not a zero sum i.e. an increase in one's power does not diminish the power of another. (Rowlands, 1995). "Power with" refers to collective action and recognizes that more can be accomplished by acting together as a group instead of acting independently (Mosedale, 2005).

Power over refers to having control or influence over the lives of others (Mosedale, 2005). Power is used as an instrument of domination and that domination extends over the individual person's lives, their close relationships, communities and beyond (Rowlands, 1995). This attempt to prevent certain groups from coming to the decision making arena is not only put in to effect by legitimizing some voices over others, but also by manipulating the consciousness of the less powerful, making them incapable of seeing that a conflict exist (Mosedale, 2005).

Definitions of empowerment

Empowerment has been defined extensively in the development literature. Rowlands (1995) defined empowerment as bringing people who are outside of the decision-making process to the decision making process (Rowlands, 1995). This requires access to political structures and formal decision-making power as well as access to markets and income that enable individuals to participate in the economic sphere. Furthermore, empowerment is a process that leads people to perceive themselves as able and entitled to occupy that decision making space (Rowlands, 1995).

Batliwala (2007) defined empowerment as a process and the result of a process of transforming the relations of power between individuals and social groups (Batliwala, 2007). The author further noted that empowerment requires a shift in ideology that justify social inequality (such as gender or caste), a change in existing patterns of access to and control over resources (economic, natural and intellectual resources) and a shift in social power structures (such as the family, state, market, education and media).

Kabeer (1999) defined empowerment in terms of choice. According to Kabeer, empowerment is the process by which those who have been denied the ability to make choices acquire such ability (Kabeer, 1999b). But she made a further distinction between being powerful and being empowered. People who exercise a great deal of choice in their lives may be powerful, but they are not necessarily empowered if they were never disempowered in the first place (Kabeer, 2005). Kabeer (1999b) further noted that the ability to make a choice constitutes three dimensions: agency, resource and achievement.

Empowerment usually involves people making decisions on matters which are important in their lives and being able to carry them out (Mosedale, 2005). In this regard, Kabeer makes an important distinction between first and second order choices. First order choices are strategic life choices (such as choice of livelihood, whether and who to marry, whether they need children) that are critical for people to live the lives they want (Kabeer, 1999b). These kind of choices shape other less consequential choices, which may be important for the quality of one's life, but do not constitute its determining parameters (Kabeer, 1999b).

Finally, there is a wide recognition in the literature that empowerment is an ongoing process rather than a product (Mosedale, 2005). This means that there is nothing like being empowered in an absolute sense, but rather people are empowered or disempowered relative to others or relative to themselves at a previous time. Consequently, there is much emphasis on empowerment as a process in the conceptual literature, but this understanding is also taking hold in the empirical literature as well. For the purpose of the dissertation, I define empowerment as consisting of five attributes: 1) Having higher socio-economic standing: education, income, employment, and household wealth; 2) Having more participation in household decision making; 3) Having more participation in one's own personal health; 4) Having higher level of media exposure and 5) Having had no reported personal exposure to violence

Dimensions of empowerment

Empowerment is a multidimensional concept that is rarely confined to a single aspect of women's lives. Here are the dimensions that are most commonly used in the literature: economic, socio-cultural, familial/interpersonal, legal, political and

psychological. It is be noted that these dimensions are quite broad in scope and in each dimension there is a range of sub-domains within which women may be empowered (Malhotra, Schuler, & Boender, 2002).

Empowerment in the psychological dimension refers to an increase in women's belief of their ability to achieve goals. This does not refer to the actual decision making power of women, but rather their own self-perception to achieve meaningful goals (Pratley, 2016). At the household level, this dimension is operationalized using measures such as self-esteem, self-efficacy, and psychological wellbeing (Malhotra et al., 2002).

Economic empowerment refers to the control over material resources as well as claims to resources. This dimension include women's monetary contribution to the household through labor as well as having a bank account and having a say over her own income (Pratley, 2016). In household studies, women's economic empowerment is commonly measured by assessing her control over income, access to and control of family resources, and her relative contribution to family support (Malhotra et al., 2002).

The social dimension of women's empowerment relates to her access to social resources. This may include group membership, being able to rely on family members and friends for social support and having access to a larger social network (Pratley, 2016). At the household level, the socio-cultural dimension is operationalized by assessing the following: lack of discrimination against daughters, women's freedom of movement, and commitment to educating girls(Malhotra et al., 2002).

The legal dimensions of women's empowerment show the extent to which women's rights are reflected and codified in law. This includes women's knowledge of the legal

system, ability to vote, obtain a land title or their ability to inherit their husband's property after his death (Pratley, 2016). At the household level, studies use knowledge of legal rights as well as domestic support for existing rights to measure the legal dimension of women's empowerment (Malhotra et al., 2002).

The political dimension of women's empowerment pertains to women's inclusion in the political process and their ability to organize for change. This can be measured by looking at the relative proportion of female to male voters in a region or country (Pratley, 2016). At the household level, surveys use the following variables to measure political empowerment: knowledge of political system and means of access to it, domestic support for political engagement and exercising the right to vote (Malhotra et al., 2002).

Key Challenges in Measuring Empowerment

There are several challenges related to measuring empowerment. The first has to do with the multidimensional nature of women's empowerment that resulted in the inconsistent aggregation of empowerment indicators across studies making comparison difficult. In some studies authors have been sharply criticized for disregarding the multidimensional nature of women's empowerment by aggregating all indicators of empowerment in to one index. In others, researchers who decided to measure women's empowerment using a single indicator were critiqued for the insufficiency of their measure. Furthermore, a study's selection of what dimension to measure makes comparison across studies difficult (Pratley, 2016).

Other critiques posit that the multidimensional nature of women's empowerment makes the concept of women's empowerment elusive. This is because empowerment in

one aspect of life does not translate to all other domains of life. For instance, a woman in sub-Saharan Africa may not be empowered enough to make decisions about her own health at the household level, but may have a say in the national political and legal system because of her right to vote and her active participation political meetings (Pratley, 2016).

The context specificity of empowerment is also another hurdle in measuring empowerment. This means that the behaviors and attributes that symbolize empowerment in one context might have different meaning elsewhere (Malhotra et al., 2002). For instance, indicators of mobility and freedom of association may be a sign of empowerment in some regions of the world but not in others (Pratley, 2016). Context can also determine the extent to which empowerment at the household or individual level is a determinant factor for certain outcomes. For instance, it could be argued that with a strong public health system in a community, women's role as the intermediaries of their child's health through better education or decision-making power in the household will be less relevant (Malhotra et al., 2002).

Finally, the conceptualization of empowerment as a *process* rather than a condition or state of being presents its own methodological challenges. This is due to unavailability of data across time, subjectivity inherent in assessing process, the shift in relevance of indicators over time, and the use of proxy measures as opposed to direct measures (Malhotra et al., 2002). In response, efforts have increased to capture the process aspect of empowerment through direct measures (such as decision-making, control and choice) since such measures are thought to be the most effective representations of empowerment.

Significance of this research

The study builds on the women's empowerment study (Alemu, Conserve & Tolossa, 2017) I conducted in 2010 in Godino, a rural Ethiopian village. Employing a purposive sampling technique, the survey assessed the impact of a local NGO's intervention on the empowerment of girls and women in the locality. The previous study was a qualitative study conducted at a single site in Ethiopia. In contrast, the present research consisted of quantitative analysis of data from a national survey that involved participants from across the country. This research is unique as it is among the first that used a nationally representative data to assess the dynamics of HIV testing in Ethiopia from the perspective of women's empowerment. Findings can inform broad policy decisions as well as practices towards HIV testing in Ethiopia. The work also aligns with the current Ethiopian government's initiative to politically empower women by appointing them in high offices including head of state, cabinet and supreme court (Schemm, 2018).

Preparation of student

As part of my MA thesis, I evaluated a women's empowerment project run by a local NGO in Ethiopia. Findings from the study were presented at the 2017 APHA conference (Alemu, Conserve & Tolossa, 2017). I completed a Women's and Gender Studies class (WGST 736 Women, Work and Health: Global Perspectives) in the spring of 2017 to obtain an international perspective on the topic of women's work, and health. I completed two independent study courses (HPEB 790 – Applied Quantitative Data Analysis & HPEB 790 – Comprehensive Literature Review on Women's Health in Sub-Saharan Africa) to further enhance my knowledge on women's issues in sub-Saharan Africa. In the Applied Quantitative Data Analysis course, I conducted a secondary data

analysis of the Ethiopian Demographic and Health survey. In the Comprehensive Literature Review on Women's Health in Sub-Saharan Africa, I completed a literature review of women's health in sub-Saharan Africa. I presented the preliminary findings from these two projects at the APHA 2018 conference in San Diego, CA (Alemu, Conserve, Olatosi, Iwelunmor & Ekuban 2018).

In terms of coursework, I completed 2 higher level biostatistics classes (BIOS 701 & BIOS 771) in which I learned important statistical and software skills that could be applied to any quantitative analysis. I also took a measurement class (Applied Measurement in Health Education Research/HPEB 810) that enhanced my understanding about scale development and exploratory factor analysis.

Implications of Research for Candidate

This research is expected to increase our understanding about the relationship between women's empowerment and HIV testing in Ethiopia. It can inform future policies/practices that will increase HIV testing uptake. It can also serve as an input for future research on women's health in sub-Saharan Africa. In the future, I have a plan to expand on my research by assessing the link between empowerment and other health behaviors among women. For instance, while young women's sexual autonomy, fertility decisions and use of contraception are areas that need national policy attention, there is still a paucity of research on the topic. This research will serve as a first step towards that process. Furthermore, the complex survey data analysis experience I gained through my dissertation will help me analyze data collected at a national level using complex sampling design.

Chapter 3

Methods

Theoretical framework

For this study, Kabeer's (1999) theoretical framework on women's empowerment guided variable selection and analysis. Kabeer (1999) defined empowerment as "the process by which those who have been denied the ability to make strategic life choices acquire such ability." (Kabeer, 1999b). Further, she noted that the ability to make choices depend on resources, agency, and achievement, which are often intertwined and influenced by local contexts.

Kabeer (1999) further expanded on how the three dimensions of power (resource, agency and achievement) are important to fully exercise choice. The first one is resource. Resource includes the social, economic, material and institutional means important for the exercise of choice (Kabeer, 1999b). These resources are acquired through the multiplicity of relationships and interactions between members of society. Resources may take the form of actual allocations or future claims and expectations (Kabeer, 2005). Most importantly, access to such resources show the rules and norms which govern distribution and exchange in different institutions (Kabeer, 1999b).

The empirical evidence shows the link between resource access and choice. For instance, a recent population level study in Africa showed how education, wealth and region of residence are important predictors of HIV testing uptake among women age 15 to 49 (Bashemera, Nhembo, & Benedict, 2013). Likewise, this study hypothesized that there is a strong link between resource access and HIV testing uptake among women in Ethiopia. Hence, the following variables were included to assess women's access to resources: women's educational status, region of residence, household wealth, whether respondent is currently working, husband/partner's educational status, whether husband is currently working, and media access.

The second dimension of power, according to Kabeer, is agency. Agency is simply the ability to set one's goal and follow through (Kabeer, 1999b). Beyond observable action, agency is something that comes from within, and could include the meaning, motivation, and purpose individuals bring to the activities they try to accomplish. Although it is often operationalized as 'decision-making' in the social science literature, it can take many different forms including bargaining and negotiation, deception and manipulation, subversion and resistance (Kabeer, 1999b). A positive meaning that relates agency to power is the 'power to.' It refers to the ability of individuals to define and pursue their own life choices, even in the face of antagonism (Kabeer, 2005). In a negative sense, agency can be exercised as 'power over', which means, the ability of individuals or groups to override the agency of others (Kabeer, 2005).

Empirical research shows the association between agency and health care seeking behavior as well as health outcomes among women. In Ethiopia, a recent study demonstrated how women's decision-making autonomy as well as their attitude towards

gender roles determine their reproductive health care seeking behavior (Wado, 2018). A recent systematic review demonstrated the significant association between several domains of women's agency including household decision making, decision making regarding their own health care, having employment outside of the home, and exposure to intimate partner violence in determining maternal and child health outcomes (Pratley, 2016). Similarly, this study hypothesized that there is a strong link between agency and HIV testing uptake among women. And the following variables were included to measure domains of agency among women: Health care decision making, household decision making, and exposure to emotional violence.

Finally, resources and agency combine to define individual's potential to live the life they desire. Achievement refers to the extent to which this potential is realized or fails to be realized (Kabeer, 1999b). If the potential is not realized because of one's weakness, lack of energy, ability, or competence, then the issue of power will not be relevant. On the contrary, if the failure to achieve a goal is due to some fundamental constraint, then it can be considered as a manifestation of disempowerment (Kabeer, 1999b). For this study, HIV testing is considered as an achievement and is measured by asking women if they have ever been tested for HIV.

Sample Design

For administrative purposes, Ethiopia is divided into 9 geographical regions and 2 administrative cities. The sample for the 2016 Ethiopian Demographic and Health Survey (EDHS) was designed to provide estimates of key indicators for the country, for rural and urban separately, and for each of the nine regions and the two administrative cities.

The Ethiopia Population and Housing Census (PHC) conducted in 2007 by the Ethiopian Central Statistical Agency (CSA) was used as a sampling frame for the 2016 EDHS. The sampling frame, that consisted of 84,915 enumeration areas (EAs), contained information about the EA location, type of residence (rural or urban), and estimated number of residential households. Except 6 zones in the Somali region, each EA had an accompanying cartographic material that delineate geographic locations, boundaries, main access, and landmarks in or outside the EA.

Samples for the study were selected in two stages. First, each region was stratified in to two (urban and rural), yielding 21 sample strata. Then, samples of EAs were selected independently in each stratum in two stages. In the first stage, a total of 645 EAs (202 in urban and 443 in rural areas) were selected with probability proportional to the EA size (based on the 2007 PHC) and with independent selection in each sampling stratum. Then, a household listing operation was carried out in all the selected EAs, which later served as a sampling frame for the selection of households in the second stage.

In the second stage of selection, a fixed number of 28 households per cluster were selected with an equal probability systematic selection from the newly created household listing or sampling frame. All men and women age 15 to 49, who were either permanent residents of the household or visitors who stayed in the household the night before the survey, were eligible to be interviewed. In half of the selected households, all women age 15-49 were eligible for the female genital cutting (FGC) module, and only one woman per household was selected for the violence against woman module (VAW).

Questionnaires

Five questionnaires were used in the survey: The Household questionnaire, the Woman's Questionnaire, the Man's Questionnaire, the Biomarker Questionnaire, and the Health Facility Questionnaire. These questionnaires, based on the DHS Program's standard Demographic and Health Survey questionnaires, were adapted to reflect the population and health issues relevant to Ethiopia. Various stakeholders including government ministries and agencies, nongovernmental organizations, and international donors contributed to the preparation of the questionnaires. The questionnaires were first finalized in English and then translated in to the three main local languages: Amharic, Tigrigna and Oromiffa.

The household questionnaire was used to list all the usual members and visitors of selected households. Basic demographic information was collected on the characteristics of each person listed, including his or her age, sex, marital status, education, and relationship to the head of the household. The data on age and sex of household members obtained in the household questionnaire were used to identify women and men who were eligible for individual interviews.

The woman's questionnaire was used to collect information from all eligible women age 15-49 on the following topics:

- 1) Background characteristics (age, education and media exposure).
- 2) Birth history and childhood mortality
- 3) Family planning, including knowledge, use, and resources of contraceptive methods
- 4) Fertility preferences

- 5) Antenatal, delivery and postnatal care
- 6) Breastfeeding and infant feeding practices
- 7) Vaccinations and childhood illnesses
- 8) Women's work and husbands' background characteristics
- 9) Knowledge, awareness, and behavior regarding HIV/AIDS and other sexually transmitted infections (STIs)
- 10) Knowledge, attitudes, and behaviors related to other health issues (e.g. injections, smoking, chat)
- 11) Adult and maternal mortality
- 12) Female genital cutting
- 13) Fistula
- 14) Violence against women

Pretest

The pretest for the 2016 EDHS was conducted from October 1 to 28, 2015, in Bishoftu at the Asham African Training Center. It consisted of in-class training, a biomarker training, and field practice. The field practice was conducted in clusters surrounding Bishoftu that were not included in the 2016 EDHS sample. Following field practice, a debriefing session was held with the pretest field staff, and modifications to the questionnaires were made based on lessons learned from the field practice.

Training of Field staff

CSA recruited and trained 294 people for the main field work to serve as team leaders, field editors, interviewers, secondary editors, and reserve interviewers. The

training took place from December 14, 2015, to January 17, 2016, at Debre Zeit Management Institute in Bishoftu. Participants were given training on questionnaire content, interviewing techniques and field procedures, instructions on how to administer the paper and electronic questionnaire, and did mock interviews within and outside the classroom. Additionally, 72 individuals were recruited and trained on how to collect biomarker data.

Training participants were evaluated through homework, in-class exercises, quizzes, and observations made during field practice. Finally, 132 individuals were selected as interviewers, 66 as biomarker technicians, 33 as field editors, and 33 as team leaders. The selection of team leaders and field editors was based on their experience in leading survey teams and their performance during the pretest and the main training. Team leaders and field editors received additional instructions and practice using the Computer-Assisted Personal Interviewing (CAPI) system to perform supervisory activities.

Data Collection and Management

The actual data collection took place from January 18, 2016 to June 27, 2016. A total of 33 field teams, each consisting of one team leader, one field editor, three female interviewers, one male interviewer, two biomarker technicians, and one driver carried out the data collection. Furthermore, 28 quality controllers (14 for interviews and 14 for biomarkers) were dispatched during data collection to support and monitor field work.

Interviewers used tablet computers to record responses during the interviews. The tablets were equipped with Bluetooth technology to enable remote electronic transfer of files i.e. transfer of assignment sheets from team supervisors to interviewers and transfer

of completed ones from interviewers to supervisors. Electronic data files were transferred to the CSA central office in Addis Ababa every few days via a secured Internet File Streaming System (IFSS), where they were stored in a password-protected computer.

Protection of Human Subjects

Procedures and questionnaires for standard DHS surveys have been reviewed and approved by ICF Institutional Review Board (IRB). Additionally, country-specific DHS survey protocols were reviewed by the ICF IRB and typically by an IRB in the host country. ICF IRB ensured that the survey complies with the U.S. Department of Health and Human Services regulations for the protection of human subjects (45 CFR 46), while the host country IRB ensured that the survey complies with laws and norms of the nation.

Informed and Voluntary Participation

Before each interview or biomarker test was conducted, an informed consent statement was read to the respondent, who may accept or decline to participate. A parent or guardian must provide consent prior to participation by a child or adolescent. DHS informed consent statements provided details regarding:

- The purpose of the interview/test
- The expected duration of the interview
- Interview/test procedures
- Potential risks to the respondent
- Potential benefits to the respondent

- Contact information for a person who can provide the respondent with more information about the interview/test

Most importantly, the informed consent statement emphasized that participation is voluntary; that the respondent may refuse to answer any question, decline any biomarker test, or terminate participation at any time; and that the respondent's identity and information will be kept strictly confidential.

Privacy and Confidentiality during Data Collection and Data Processing

Interviews and biomarker testing were performed as privately as possible. Within each household, an eligible respondent was not interviewed in the presence of another eligible respondent. Privacy was particularly important when respondents were husband and wife, as interview questions might involve sensitive subjects such as sexual activity or domestic violence and biomarker testing might involve HIV serostatus. Results of interviews and biomarker testing were strictly confidential. DHS interviewers, health specialists, editors, and supervisors were only allowed to discuss data with other team members, and these conversations were limited to essential communications.

Each respondent's interview and biomarker data files were identified only by a series of numbers, including enumeration area (EA) number, household number, and individual number. After data processing, questionnaire cover sheets containing these identifier numbers were destroyed, and EA and household numbers were randomly reassigned. Furthermore, the geographic coordinates of each survey were displaced at a random distance and in a random direction. The displacement distance was up to two

kilometers for urban EAs and up to five kilometers for rural EAs, with one percent of randomly selected rural clusters displaced a distance up to ten kilometers. This protocol ensured that neither the individual nor the household can be identified.

Regarding questions pertaining to domestic violence against women, several special precautions were taken to protect the privacy and well-being of respondents. First, interviewers were provided with additional training on administering the questions, dealing with crisis situations, avoiding further endangering respondents, and preparing themselves emotionally. Second, interviewers reiterated informed consent immediately prior to administering domestic violence questions. Third, interviewers ensured absolute privacy, interrupting or terminating the domestic violence interview if privacy was breached. Fourth, as a further privacy protection, only one woman per household received the questions in the domestic violence module so that no one else in the household knew these issues were discussed during the interview. The women were selected at random from among all women in the household who were eligible to be interviewed. Finally, respondents were provided with information and referrals for options and services available for women experiencing domestic violence or in need of other social services.

Measure

Main outcome variable

The main outcome variable used in the study was: Ever been tested for HIV. It was assessed using a dichotomous response option: 0) No 1) Yes

Socio-demographic variables

Includes basic social and demographic characteristics of participants and their partners/husbands (e.g., age, education, marital status, wealth, occupation, residence, whether respondent is currently working, husband/partner's education, whether husband is currently working).

Empowerment Variables

Health care decision making

Person who usually decides on respondent's health care

Response options were: 1) Respondent alone 2) Respondent and Husband/partner 3) respondent and other person 4) husband/partner alone 5) someone else 6) other.

In the analysis, the 6 response options were categorized into two:

A) Response options 1 and 2 were combined to create a new response option called:

Participate in health care decision making

B) Response options 3 through 6 were combined to create a new response option called:

Don't participate in health care decision making

Household decision making

Was measured by combining the following 3 variables:

- 1) Person who usually decides on respondent's health care,
- 2) Person who usually decides on large household purchases
- 3) Person who usually decides on visits to family or relatives.

Response options for each of the four variables were: 1) Respondent alone 2) Respondent and Husband/partner 3) respondent and other person 4) husband/partner alone 5) someone else 6) other.

In the analysis, the 6 response options were recoded into 2 response options:

A) Response options 1 and 2 were recoded to: Participate in household decision making

B) Response options 3 through 6 were recoded to: Don't participate in household decision making

Media Access

The following 3 variables were combined to create a new composite variable:

- 1) Frequency of reading newspaper or magazine
- 2) Frequency of listening to radio
- 3) Frequency of watching TV

Response options were: 0) Not at all 1) less than once a week 2) At least once a week 3) Almost everyday

A composite variable measuring media access was created by combining the three variables above. In the analysis, the response options were recoded into 2.

A) Response options 0 and 1 were combined to create a new response option: Limited or none

B) Response options 2 and 3 were combined to create a new response option: At least once a week

Exposure to Emotional violence

Was measured by asking women if their husband/partner

- 1) Said or did something to humiliate them in front of others
- 2) Threaten to hurt or harm them or someone close to them
- 3) Insult them or make them feel bad about themselves

Response options were: 0) No 1) Yes 8) Don't know

A composite variable was created by combining the three variables. In the analysis, those who said don't know (8) were excluded.

Specific aims/hypothesis of the research

Aim 1

To examine the associations between socio-demographic variables (e.g., age, educational level, occupation, household income, urban or rural residence) and uptake of HIV testing among Ethiopian women of reproductive age.

Hypothesis 1

Women with better socio-economic standing in terms of wealth, occupation, education and urban residence will be more likely to have been tested for HIV than those with limited resource access

Aim 2

To assess the association between household decision making autonomy and uptake of HIV testing among Ethiopian women.

Hypothesis 2

More empowered women, (i.e., those who participate in household decision making) will be more likely to have been tested for HIV than women who do not actively participate in household decision making.

Aim 3

Assess the association between Ethiopian women's level of personal health care decision making autonomy and uptake of HIV testing.

Hypothesis 3

Compared to women who do not participate in their own personal health care decisions, women who do actively participate in their personal health care will be more likely to have been tested for HIV.

Aim 4

Assess the association between media exposure and HIV testing among women.

Hypothesis 4

Compared to those who have limited or no access to the media, women who are exposed to the media at least once a week will be more likely to have been tested for HIV.

Aim 5

Assess the association between exposure to spousal emotional violence and HIV testing among women.

Hypothesis 5

Compared to those who had no reported personal exposure to emotional violence, women who reported prior exposure to emotional violence will be less likely to have been tested for HIV.

Data Analysis

The data analysis was conducted using SPSS. The process involved the following five steps: First, variables were carefully selected for the analysis. Second, the response options for some of the variables were recoded. Third, data cleaning was conducted by excluding those variables with missing data from the analysis. Fourth, an analysis plan was created in SPSS to account for the weight and sampling design of the survey. Fifth, I obtained frequency for all variables, conducted bivariate analysis using cross tabulations and run logistic regression by entering the socio-demographic and empowerment variables in the model. Significance was considered at 95% confidence level and P-value less than 0.05 ($P < 0.05$).

Chapter 4

Results

4.1 Manuscript 1

Health Care Decision Making and HIV Testing among Ethiopian Women: Results from the 2016 Ethiopian Demographic and Health Survey¹

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Abstract

HIV testing is a cornerstone for early HIV diagnoses which can improve quality of life, survival, and reduce forward transmission. The ability to make an independent decision on one's health determines uptake of HIV testing among women. This study examined correlates of HIV testing among women in Ethiopia using the 2016 Ethiopian Demographic and Health Survey. The sample was collected using stratified cluster sampling design and selected in two stages. A total of 15,683 women age 15-49 completed the survey. For this study, only 8681 participants were included. Kabeer's theoretical framework on women's empowerment was used for variable selection and analysis. Using bivariate analysis and multiple logistic regression, the study assessed the association between ever being tested for HIV and other demographic and non-demographic variables. Overall, 52% of the women reported HIV testing at some point in their life. After adjusting for all covariates, multivariate logistic regression results showed, education, residence, wealth index, occupation, living arrangement and health care decision making were significantly ($P < 0.05$) associated with ever being tested for HIV. For instance, women who don't participate in the decision making of their own health care were less likely to have ever been tested (AOR: 0.77 (0.63 -0.94) than those who do. This implies that HIV prevention among Ethiopian women presupposes national policies that promote their overall socioeconomic empowerment. Providing more resources to women, especially to those living in rural areas as well as collaborating with men to break patriarchal norms, might increase HIV testing.

Introduction

In sub-Saharan Africa, women comprise 56 percent of new HIV infections among adults 15 and older (United Nations Department of Economics and Social Affairs, 2010). Women 15 to 24 years old are the most affected, accounting for 66% of new infections in this age group. In general, the prevalence of HIV infection in women has increased in the past twenty years and that trend is most pronounced in sub-Saharan Africa where women account for 60 % of the people living with the virus (WHO, 2012). In Ethiopia, among women and men age 15 to 49, HIV prevalence is 0.9% with a slightly higher prevalence among women (1.2%) than men (0.6%) (EDHS 2016 Team, 2016).

HIV testing is an effective HIV prevention strategy (Mavedzenge, Baggaley, & Corbett, 2013). Serving as an entry point to the health care system, HIV testing can lead to a continuum of health care and social services that improves health outcomes of individuals living with HIV (Mukolo & Villegas, 2013). Early HIV detection is also critical to reducing patient morbidity and mortality as well as preventing future HIV transmission (Cohen et al., 2015). The HIV prevention endeavor is also in line with the UNAIDS 2020 plan of linking 90% of HIV positive individuals to care (Mulawa & Barrington, 2016).

Most of the literature on HIV testing in Ethiopia has focused on clinical care settings. (Alemu et al., 2017; Ayenew et al., 2010; Balcha et al., 2011; Bradley et al., 2011; Demissie et al., 2006; Deressa et al., 2014; Facha et al., 2016; Fetene & Feleke, 2010; Jerene et al., 2007; Testing & Initiation, 2010). Participants in these studies were either patients attending clinics to receive treatment for certain ailments (Testing & Initiation, 2010; Balcha et al., 2011; Facha, Kassahun, & Workicho, 2016; Ayenew, Leykun,

Colebunders, & Deribew, 2010; Fetene & Feleke, 2010; Jerene, Endale, & Lindtjørn, 2007) or were pregnant mothers attending antenatal care (Deressa, Seme, Asefa, Teshome, & Enqusellassie, 2014; Alemu, Ambaw, & Wilder-Smith, 2017; Demissie, Deribew, & Abera, 2006). Most prior studies have assessed correlates of HIV testing from the perspective of HIV related attitude, knowledge and behavior (Bradley, Tsui, Kidanu, & Gillespie, 2011; Demissie, Deribew, & Abera, 2006; Facha, Kassahun, & Workicho, 2016). Very few studies have focused on women, and these studies were carried out among pregnant women (Alemu, Ambaw, & Wilder-Smith, 2017; Demissie, Deribew, & Abera, 2006; Deressa, Seme, Asefa, Teshome, & Enqusellassie, 2014).

Examination of women's power and influence is often associated with the concept of empowerment. Kabeer (1999) defined empowerment as “ the process by which those who have been denied the ability to make strategic life choices acquire such ability”(Kabeer, 1999b). Further, she noted that the ability to make choices depend on resources, agency, and achievement, which are often intertwined and influenced by local contexts (Kabeer, 1999b). Others have defined empowerment as the process by which women redefine and extend the possibility of boundaries in areas where they have been restricted (Mosedale, 2005). Overall there is a consensus in the literature that empowerment involves both the ability to make decisions on matters which are important and the ability to carry these decisions out.

Kabeer (1999b) further expanded on how the three dimensions of power (resource, agency and achievement) are important to fully exercise choice. The first is resource, which includes the social, economic, material and institutional means important for the exercise of choice. These resources are acquired through the multiplicity of relationships and

interactions between members of society. Resources may take the form of actual allocations or future claims and expectations (Kabeer, 2005). Most importantly, access to such resources show the rules and norms which govern distribution and exchange in different institutions (Kabeer, 1999b).

Agency is the second dimension of power. Simply stated, agency is the ability to set one's goal and follow through (Kabeer, 1999b). Beyond observable action, agency is internal, and could include the meaning, motivation, and purpose individuals bring to the activities they try to accomplish. Although it is often operationalized as 'decision-making' in the social science literature, agency can take many different forms including bargaining and negotiation, deception and manipulation, subversion and resistance (Kabeer, 1999b). A positive meaning that relates agency to power is the 'power to.' It refers to the ability of individuals to define and pursue their own life choices, even in the face of antagonism (Kabeer, 2005). In a negative sense, agency can be exercised as 'power over', which means, the ability of individuals or groups to override the agency of others (Kabeer, 2005).

Finally, resources and agency combine to define an individual's potential to live the life he or she desires. Achievement refers to the extent to which this potential is realized or fails to be realized (Kabeer, 1999b). If the potential is not realized because of one's weakness, laziness and incompetence, then the issue of power will not be relevant. On the contrary, if the failure to achieve a goal is due to some fundamental constraint, then it can be considered as a manifestation of disempowerment (Kabeer, 1999b).

Design and Method

This research examined the association between Ethiopian women's healthcare decision-making autonomy and HIV testing, using a nationally representative data set. It

will be the first study to examine the relationship between healthcare decision-making and HIV testing among Ethiopian women using a nationally representative data. The data for this analysis were taken from the Ethiopian Demographic and Health Survey conducted in 2016 (EDHS 2016 Team, 2016). The samples were collected using stratified cluster sampling design and were selected in two stages. In the first stage, enumeration areas (EA) were selected with probability proportional to the EA size and with independent selection in each sampling stratum. In the second stage, 28 households per cluster were selected with an equal probability systematic selection. A total of 12,688 men aged 15-59 and 15,683 women aged 15-49 participated in the original survey. For this study, the sampling frame consists of all currently married women. We excluded those with missing data on the question related to decision making and other covariates adjusted in the multiple logistic regression. The final study sample consisted of 8681 participants.

Measurement

The main outcome variable, ever been tested for HIV, was measured by a yes/no response option. Other demographic and non-demographic variables were included to measure association between these variables and the outcome variable. Resource access was measured using education, wealth, employment, residence, and living arrangement. Agency was measured by assessing the health care decision making autonomy. Participants were asked to identify the “person who usually decides on respondent’s (their own) health care” and were given 6 response options: respondent alone, respondent and husband/partner, husband and other person, husband/partner alone, someone else and other. This variable was dummy coded so that those who said, “respondent alone” or “respondent and husband/partner” were coded as “participate” and those who responded

otherwise were coded as “don’t participate.” Based on findings from previous studies (Ayenew et al., 2010; Alemu et al., 2017), the following variables were adjusted in the multivariate logistic regression model: comprehensive HIV knowledge, discriminatory attitudes towards people living with HIV, knowing a place to get tested, and media access.

Data analysis

SPSS version 24 was used for data analysis. The process included conducting an initial descriptive analysis to obtain frequencies for each variable, followed by assessing the association between the dependent and independent variables using the Rao Scott chi-square test statistic (χ^2). We then conducted a multivariate logistic regression that adjusted for all the covariates. Two tailed P-value $<.05$ was considered statistically significant. Sampling weights that accounted for complex survey design were incorporated in all analysis.

Results

The participants ($n=8681$) were between the ages of 15 to 49, with the majority (44%) being in the 25 to 39 age category (see Table 4.1). Most reported no formal education (59.4%) or some primary education (29.4%). All participants (100%) were either married or living with a partner. The majority (68.6%) were not currently employed. Most (82.8%) were from rural areas and living with husbands (92%) at the time of the survey. In terms of economic status, 42.6% were considered wealthy, 20.3% were considered middle class and 37.1% were poor. The majority (81.5%) of women actively participated in the decision making of their own health care and more than half (52%) took HIV test at some point in their life.

Having been tested for HIV was the highest (55.7%) in the 15-24 age category and was the lowest (46%) in the 40 to 49 age group ($P < 0.001$). Testing for HIV increased with education with the lowest (40.7%) and highest (90.2%) in the no education and those who completed secondary and above respectively ($P < 0.001$). HIV testing was lower (51%) for those living with a partner ($P < 0.001$) compared to those who don't stay together. Those who work (61.9%) were more likely to test ($P < 0.001$) than those who did not (47.5%).

HIV testing was higher among urban residents (86.9%) and wealthy women (70%) compared to those who were from rural areas and were poor ($P < 0.001$). Women's HIV testing was higher for those whose husbands/partners currently work (52.9%). HIV testing increased with participation in health care decision making. Compared to those who did not participate in their personal health care decision making (40.5%) those who do participate were more likely ($P < 0.001$) to test (54.6%) for HIV.

The results of the multivariate logistic regression are presented in Table 4.2. In the multiple logistic regression model, all the covariates except marital status and knowing a place to get tested were included. All but age, husband's education, husband's employment and age at first sex showed significant association with HIV testing among women. For instance, compared to women who participate in the decision making of their own health care, those who don't were significantly less likely to have ever been tested for HIV (AOR 0.77, 95% CI 0.63 - 0.94).

Women were more likely to test with increasing education and wealth. Compared to women with secondary or higher education, those who had primary and no education were significantly less likely to have ever been tested for HIV (AOR 0.45, 95% CI 0.32-0.65, AOR 0.29, 95% CI (0.20 – 0.43, respectively). Similarly, women from middle class

and poor backgrounds were significantly less likely to test compared to those from rich background (AOR 0.64, 95% CI 0.51-0.80, AOR 0.48, 95% CI 0.39 – 0.60, respectively). Women's HIV testing experience also differed by region of residence. Compared to rural women, urban women were more than two times (AOR 2.30, 95% CI (1.71- 3.36) more likely to have ever been tested for HIV. Likewise, employment was a strong predictor of HIV testing uptake among women. Compared to those who are currently employed, those who are not working were less likely to have ever been tested for HIV (AOR 0.82, 95% CI 0.69 – 0.97). Finally, women who currently lived with their husbands/partners were less likely to test for HIV (AOR 0.77, 95% CI 0.61-0.99) compared to those who did not cohabit.

Discussion

This study assessed correlates of HIV testing among married women in Ethiopia using a nationally representative data. Overall, 52 % of women aged 15-49 tested for HIV at some point in their life. Given that most of the prior research on HIV testing in Ethiopia has focused on clinical settings, data on the overall HIV testing trend among community-dwelling women is instrumental in understanding determinants of HIV testing and design interventions that address key factors.

HIV testing among women was associated with education, residence, wealth, employment, health care decision making and living arrangement. The findings indicated that women's participation in HIV testing experience increased with educational attainment, and women with secondary level education or higher were more likely to report having ever been tested. This may reflect the role of education in increasing women's capacity to examine, question, and act on the conditions of their lives. Education also

increases the likelihood that women will look after their own well-being and that of their family (Kabeer, 2005). Similar findings have been observed in prior research, including studies conducted among TB patients in Ethiopia have demonstrated how formal education including understanding the benefits of VCT and low stigmatizing attitudes predicted HIV testing uptake (Ayenew et al., 2010). Similarly, a study in Ghana found that more educated women (i.e., those with either primary or secondary education) were more likely to report having had HIV testing (Tenkorang & Owusu, 2010).

Place of residence was significantly associated with HIV testing. Women living in rural areas were less likely to have had an HIV testing experience compared to those living in urban centers. A similar study in Ghana demonstrated that although rural women were less likely to have ever been tested, they were more likely to want to test for HIV (Tenkorang & Owusu, 2010). This finding is not surprising, given the rural-urban disparity in health care delivery in low income settings. In fact, one of the challenges facing African policy makers is how to provide quality, accessible and comprehensive health care to women and girls in both isolated rural communities and growing urban centers. Whereas rural women often must travel long distances to access care, those in large cities frequently encounter long hours to receive care at crowded facilities (WHO, 2012).

In this study, household wealth was an important predictor of HIV testing. Compared to those who came from poor households, women who had better economic standing were more likely to test for HIV. Women coming from the richest wealth quintile were more than two times more likely to test for HIV compared to poorer women. A possible explanation is that women from wealthier households have greater odds of having a better education that makes reproductive health and HIV related information more

accessible. In almost every country where data is available, knowledge about HIV prevention is higher among men and women of high economic status than among those who are poor (Türmen, 2003).

Another interesting finding was how women's employment was associated with HIV testing. A possible explanation is that paid work may increase women's agency in strategic ways. For example, evidence from Asia suggests the multiple ways in which women's access to microcredit led to fundamental changes in women's lives, including a change in their self-perception, their role in household decision making, and reduction in domestic violence (Kabeer, 2005).

Women's participation in their own health care was an important predictor of HIV testing. This is in line with findings from other studies in sub-Saharan Africa. For example, Musheke and colleagues (2013) reported that the ultimate authority on health care seeking lies with men, but also indicated how communication with, and support from partners improved uptake of HIV testing (Musheke et al., 2013). This finding slightly differs from earlier studies in Africa that highlighted the need for women to seek permission from partners prior to HIV testing while men made the decision to test on their own (Maman et al., 2001).

Finally, women's living arrangement was associated with their HIV testing experience. Women who lived with their husbands/partners were less likely to be tested. This is consistent with previous research findings from Sub-Saharan Africa that show how some women shun HIV testing to avoid straining marital relationships, given that HIV positive women often bear the blame for contracting the disease (Musheke et al., 2013).

A strength of this study is that it is based on a nationally representative sample, making generalizability more plausible, although it is not without its limitations. First, given that it was a cross-sectional study, it is not possible to draw causal inferences. To further validate the findings, other research designs such as longitudinal methods should be employed. Second, given that the interviews were conducted face to face and required respondents to think retrospectively, recall bias and social desirability bias may have influenced response accuracy.

Conclusion

The findings of this research could potentially inform HIV testing interventions among African women. First and foremost, public policies should focus on enhancing the socio-economic status of women. Particularly, increasing educational attainment and income of women through structural interventions at the policy level may likely increase HIV testing. Second, HIV prevention interventions should consider men as important stakeholders. Evidenced that some local NGOs were effective in empowering rural women using men as partners, the same can be applied to enhancing uptake of HIV testing. Third, HIV testing campaigns and interventions should particularly target rural women in order to ensure they receive essential health care messages. Fourth, the government should expand health care access among rural communities. Increasing alternatives to facility-based HIV testing, such as promoting HIV self-testing kits, is an important strategy that showed promising results in other African settings.

References

- Aday, L. A., & Andersen, R. (1974). A framework for the study of access to medical care. *Health Services Research*.
- Alemu, Y. M., Ambaw, F., & Wilder-Smith, A. (2017). Utilization of HIV testing services among pregnant mothers in low income primary care settings in northern Ethiopia: A cross sectional study. *BMC Pregnancy and Childbirth*. <https://doi.org/10.1186/s12884-017-1389-2>
- Andersson, N., Cockcroft, A., & Shea, B. (2008). Gender-based violence and HIV: Relevance for HIV prevention in hyperendemic countries of southern Africa. *AIDS*. <https://doi.org/10.1097/01.aids.0000341778.73038.86>
- Avert. (2017). Global HIV and AIDS statistics | AVERT. *Avert*. <https://doi.org/10.1596/1813-9450-6869>
- Ayeneu, A., Leykun, A., Colebunders, R., & Deribew, A. (2010). Predictors of HIV testing among patients with tuberculosis in North West Ethiopia: A case-control study. *PLoS ONE*. <https://doi.org/10.1371/journal.pone.0009702>
- Bago, J. L., & Lompo, M. L. (2019). Exploring the linkage between exposure to mass media and HIV awareness among adolescents in Uganda. *Sexual and Reproductive Healthcare*. <https://doi.org/10.1016/j.srhc.2019.04.004>
- Balcha, T. T., Lecerof, S. S., & Jeppsson, A. R. (2011). Strategic challenges of PMTCT program implementation in Ethiopia. *Journal of the International Association of Physicians in AIDS Care*. <https://doi.org/10.1177/1545109710369935>
- Bashemera, D. R., Nhembo, M. J., & Benedict, G. (2013). The role of women's empowerment in influencing HIV testing . *DHS Working Papers No. 101* .
- Batliwala, S. (2007). Taking the power out of empowerment - An experiential account. *Development in Practice*. <https://doi.org/10.1080/09614520701469559>
- Berry, M. E. (2015). When “Bright Futures” Fade: Paradoxes of Women's Empowerment in Rwanda. *Signs: Journal of Women in Culture and Society*. <https://doi.org/10.1086/681899>
- Bradley, H., Tsui, A., Kidanu, A., & Gillespie, D. (2011). Client characteristics and HIV risk associated with repeat HIV testing among women in Ethiopia. *AIDS and Behavior*. <https://doi.org/10.1007/s10461-010-9765-1>
- Burnet, J. E. (2007). *Jefremovas Villia. Brickyards to Graveyards: From Production to Genocide in Rwanda*. Albany, N.Y.: State University of New York Press, 2002. xi + 162 pp. Illustrations. Maps. Photographs. Appendixes. Notes. Bibliography. Index. \$21.95. Paper. *African Studies Review*. <https://doi.org/10.1353/arw.2005.0096>
- Buvé, A., Bishikwabo-Nsarhaza, K., & Mutangadura, G. (2002). The spread and effect of HIV-1 infection in sub-Saharan Africa. *Lancet*. [https://doi.org/10.1016/S0140-6736\(02\)08823-2](https://doi.org/10.1016/S0140-6736(02)08823-2)

- Castle, S. (2003). Doubting the existence of AIDS: A barrier to voluntary HIV testing and counselling in urban Mali. *Health Policy and Planning*. <https://doi.org/10.1093/heapol/czg019>
- CDC. (2018). About HIV/AIDS | HIV Basics | HIV/AIDS | CDC.
- CEDAW; UN General Assembly. Convention on the Elimination of All Forms of Discrimination against Women., Annual review of population law § (1979). <https://doi.org/10.1093/oxfordhb/9780199560103.003.0005>
- Central Statistical Agency [Ethiopia] and ICF International. (2016). *Ethiopian Demographic and Health Survey 2016 Key Indicators Report. Ethiopians Water Sector Development Program*.
- Chirawu, P., Langhaug, L., Mavhu, W., Pascoe, S., Dirawo, J., & Cowan, F. (2010). Acceptability and challenges of implementing voluntary counselling and testing (VCT) in rural Zimbabwe: Evidence from the Regai Dzive Shiri Project. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*. <https://doi.org/10.1080/09540120903012577>
- Cohen, M. S., Chen, Y. Q., McCauley, M., Gamble, T., Hosseinipour, M. C., Kumarasamy, N., ... Fleming, T. R. (2015). Final results of the HPTN 052 randomized controlled trial: antiretroviral therapy prevents HIV transmission. *Journal of International Aids Society*. <https://doi.org/10.7448/IAS.18.5.20482>
- Dellar, R. C., Dlamini, S., & Karim, Q. A. (2015). Adolescent girls and young women: Key populations for HIV epidemic control. *Journal of the International AIDS Society*. <https://doi.org/10.7448/IAS.18.2.19408>
- Demissie, A., Deribew, A., & Abera, M. (2006). Determinants of acceptance of voluntary HIV testing among antenatal clinic attendees at Dil Chora Hospital , Dire Dawa ,.
- Department of Economic and Social Affairs. (2010). *The World's Women 2010 - Trends and Statistics. United Nations Department of Economic and Social Affairs*. <https://doi.org/ST/ESA/STAT/SER.K/19>
- Deressa, W., Seme, A., Asefa, A., Teshome, G., & Enqusellassie, F. (2014). Utilization of PMTCT services and associated factors among pregnant women attending antenatal clinics in Addis Ababa, Ethiopia. *BMC Pregnancy and Childbirth*. <https://doi.org/10.1186/1471-2393-14-328>
- Dunkle, K. L., Jewkes, R. K., Brown, H. C., Gray, G. E., McIntyre, J. A., & Harlow, S. D. (2004a). Gender-based violence, relationship power, and risk of HIV infection in women attending antenatal clinics in South Africa. *Lancet*. [https://doi.org/10.1016/S0140-6736\(04\)16098-4](https://doi.org/10.1016/S0140-6736(04)16098-4)
- Dunkle, K. L., Jewkes, R. K., Brown, H. C., Gray, G. E., McIntyre, J. A., & Harlow, S. D. (2004b). Transactional sex among women in Soweto, South Africa: prevalence, risk factors and association with HIV infection. *Social Science & Medicine*, 59(8), 1581–1592.

- Ebrahim, N. B., & Atteraya, M. S. (2018). Women's Decision-Making Autonomy and their Attitude towards Wife-Beating: Findings from the 2011 Ethiopia's Demographic and Health Survey. *Journal of Immigrant and Minority Health*. <https://doi.org/10.1007/s10903-017-0592-6>
- EDHS 2016 Team. (2016). Ethiopian Demographic and Health Survey. *Report*.
- Erulkar, A., & Ab Mekbib, T. (2007). Invisible and vulnerable: Adolescent domestic workers in Addis Ababa, Ethiopia. *Vulnerable Children and Youth Studies*. <https://doi.org/10.1080/17450120701487857>
- Facha, W., Kassahun, W., & Workicho, A. (2016). Predictors of provider- initiated HIV testing and counseling refusal by outpatient department clients in Wolaita zone, Southern Ethiopia: A case control study. *BMC Public Health*. <https://doi.org/10.1109/WIRLES.2005.1549530>
- FAWE. (2017). Girls' Education in Sub-Saharan Africa.
- Fetene, N. W., & Feleke, A. D. (2010). Missed opportunities for earlier HIV testing and diagnosis at the health facilities of Dessie town, North East Ethiopia. *BMC Public Health*. <https://doi.org/10.1186/1471-2458-10-362>
- Frank, E. (2009). The relation of HIV testing and treatment to identity formation in Zambia. *African Journal of AIDS Research*. <https://doi.org/10.2989/AJAR.2009.8.4.15.1052>
- Fuentes, C. M. M. (2008). Pathways from Interpersonal Violence to Sexually Transmitted Infections: A Mixed-Method Study of Diverse Women. *Journal of Women's Health*. <https://doi.org/10.1089/jwh.2008.0885>
- Gelberg, L., Andersen, R. M., & Leake, B. D. (2000). The Behavioral Model for Vulnerable Populations: application to medical care use and outcomes for homeless people. *Health Services Research*.
- Grant, E., Logie, D., Masura, M., Gorman, D., & Murray, S. A. (2008). Factors facilitating and challenging access and adherence to antiretroviral therapy in a township in the Zambian Copperbelt: A qualitative study. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*. <https://doi.org/10.1080/09540120701854634>
- Gregson, S., Waddell, H., & Chandiwana, S. (2001). School education and HIV control in sub-Saharan Africa: From discord to harmony? *Journal of International Development*, 13(4), 467–485. <https://doi.org/10.1002/jid.798>
- Gupta, G. R. (2000). Gender, sexuality, and HIV/AIDS: the what, the why, and the how. *Canadian HIV/AIDS Policy & Law Review*. <https://doi.org/10.1016/j.jcct.2007.12.012>
- Heise, L. L., & Elias, C. (1995). Transforming AIDS prevention to meet women's needs: A focus on developing countries. *Social Science and Medicine*. [https://doi.org/10.1016/0277-9536\(94\)00165-P](https://doi.org/10.1016/0277-9536(94)00165-P)
- International, C. S. A. [Ethiopia] and I. (2012). Ethiopia Demographic and Health Survey 2011. *Health San Francisco*. <https://doi.org/978-92-1-101320-7>

- Izugbara, C. O., Undie, C. C., Mudege, N. N., & Ezeh, A. C. (2009). Male youth and voluntary counseling and HIV-testing: The case of Malawi and Uganda. *Sex Education*. <https://doi.org/10.1080/14681810903059078>
- Jerene, D., Endale, A., & Lindtjørn, B. (2007). Acceptability of HIV counselling and testing among tuberculosis patients in south Ethiopia. *BMC International Health and Human Rights*. <https://doi.org/10.1186/1472-698X-7-4>
- Joint United Nations Program on HIV/AIDS. (2014). Treatment 2020 90-90-90 to help end the AIDS epidemic. *United Nations*.
- Kabeer, N. (1999a). Resources, agency, achievements: Reflections on the measurement of women's empowerment. *Development and Change*. <https://doi.org/10.1111/1467-7660.00125>
- Kabeer, N. (1999b). Resources , Agency , Achievements : Reflections on the Measurement of Women ' s Empowerment, 30(May), 435–464.
- Kabeer, N. (2005). Gender equality and women's empowerment: A critical analysis of the third Millennium Development Goal. *Gender and Development*. <https://doi.org/10.1080/13552070512331332273>
- Kaiser Family Foundation. (2016). The Global HIV / AIDS Epidemic: Fact Sheet. *The Henry Kaiser Family Foundation*.
- Kharsany, A. B. M., & Karim, Q. A. (2016). HIV Infection and AIDS in Sub-Saharan Africa: Current Status, Challenges and Opportunities. *The Open AIDS Journal*. <https://doi.org/10.2174/1874613601610010034>
- Khumalo, K. E., McKay, K. H., & Freimund, W. (2015). Who is a “real woman”? Empowerment and the discourse of respectability in Namibia's Zambezi region. *Women's Studies International Forum*. <https://doi.org/10.1016/j.wsif.2014.10.002>
- Kim, J. C., Watts, C. H., Hargreaves, J. R., Ndhlovu, L. X., Phetla, G., Morison, L. A., ... Pronyk, P. (2007). Understanding the impact of a microfinance-based intervention on women's empowerment and the reduction of intimate partner violence in South Africa. *American Journal of Public Health*. <https://doi.org/10.2105/AJPH.2006.095521>
- Kosack, C. S., Page, A. L., Beelaert, G., Benson, T., Savane, A., Ng'Ang'A, A., ... Fransen, K. (2017). Towards more accurate HIV testing in sub-Saharan Africa: A multi-site evaluation of HIV RDTs and risk factors for false positives. *Journal of the International AIDS Society*. <https://doi.org/10.7448/IAS.20.1.21345>
- Larsson, E. C., Thorson, A., Nsabagasani, X., Namusoko, S., Popenoe, R., & Ekström, A. M. (2010). Mistrust in marriage-Reasons why men do not accept couple HIV testing during antenatal care - A qualitative study in eastern Uganda. *BMC Public Health*. <https://doi.org/10.1186/1471-2458-10-769>
- Link, B. G., & Phelan, J. (2006). Social Conditions As Fundamental Causes of Disease. *Journal of Health and Social Behavior*. <https://doi.org/10.2307/2626958>

- Luginaah, I. N., Yiridoe, E. K., & Taabazuing, M. M. (2005). From mandatory to voluntary testing: Balancing human rights, religious and cultural values, and HIV/AIDS prevention in Ghana. *Social Science and Medicine*. <https://doi.org/10.1016/j.socscimed.2005.03.034>
- Luseno, W. K., & Wechsberg, W. M. (2009). Correlates of HIV testing among South African women with high sexual and substance-use risk behaviours. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*. <https://doi.org/10.1080/09540120802017594>
- Mabunda, G. (2006). Voluntary HIV Counseling and Testing: Knowledge and Practices in a Rural South African Village. *Journal of Transcultural Nursing*. <https://doi.org/10.1177/1043659605281978>
- MacQuarrie, K. L. D., Winter, R., & Kishor, S. (2013). Spousal Violence and HIV: Exploring the Linkages in Five Sub-Saharan African Countries. *DHS Analytical Study No 36*.
- Malhotra, A., Schuler, S. R., & Boender, C. (2002). Women's empowerment as a variable in international development. *Measuring Empowerment: Cross-Disciplinary Perspectives*. <https://doi.org/10.1596/0-8213-6057-4>
- Maman, S., Campbell, J., Sweat, M. D., & Gielen, A. C. (2000). The intersections of HIV and violence: directions for future research and interventions 10.1016/S0277-9536(99)00270-1 : Social Science & Medicine | ScienceDirect.com, 50.
- Maman, S., Mbwambo, J., Hogan, N. M., Kilonzo, G. P., & Sweat, M. (2001). Women's barriers to HIV-1 testing and disclosure: Challenges for HIV-1 voluntary counselling and testing. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*. <https://doi.org/10.1080/09540120120063223>
- Maman, S., Mbwambo, J. K., Hogan, N. M., Kilonzo, G. P., Campbell, J. C., Weiss, E., & Sweat, M. D. (2002). HIV-positive women report more lifetime partner-violence: Findings from a voluntary counseling and testing clinic in Dar es Salaam, Tanzania. *American Journal of Public Health*. <https://doi.org/10.2105/AJPH.92.8.1331>
- Mane, P., & Aggleton, P. (2001). Gender and HIV/AIDS: What Do Men have to Do with it? *Current Sociology*. <https://doi.org/10.1177/0011392101496005>
- Mavedzenge, S. N., Baggaley, R., & Corbett, E. L. (2013). A review of self-testing for HIV: Research and policy priorities in a new era of HIV prevention. *Clinical Infectious Diseases*. <https://doi.org/10.1093/cid/cit156>
- Meiberg, A. E., Bos, A. E. R., Onya, H. E., & Schaalma, H. P. (2008). Fear of stigmatization as barrier to voluntary HIV counselling and testing in South Africa. *East African Journal of Public Health*.
- Mosedale, S. (2005). Assessing women's empowerment: Towards a conceptual framework. *Journal of International Development*. <https://doi.org/10.1002/jid.1212>
- Mukolo, A., & Villegas, R. (2013). Predictors of Late Presentation for HIV Diagnosis : A Literature Review and Suggested Way Forward, 5–30.

<https://doi.org/10.1007/s10461-011-0097-6>

- Mulawa, M., & Barrington, C. (2016). Social Network Influence on HIV Testing Among Urban Men in Tanzania. *AIDS and Behavior*, (August). <https://doi.org/10.1007/s10461-016-1513-8>
- Musheke, M., Ntalasha, H., Gari, S., McKenzie, O., Bond, V., Martin-Hilber, A., & Merten, S. (2013). A systematic review of qualitative findings on factors enabling and deterring uptake of HIV testing in Sub-Saharan Africa. *BMC Public Health*. <https://doi.org/10.1186/1471-2458-13-220>
- Obermeyer, C. M., & Osborn, M. (2007). The utilization of testing and counseling for HIV: A review of the social and behavioral evidence. *American Journal of Public Health*. <https://doi.org/10.2105/AJPH.2006.096263>
- Pampel, F. C., Krueger, P. M., & Denney, J. T. (2010). Socioeconomic disparities in health behaviors. *Annual Review of Sociology*, 36, 349.
- Pathfinder. (2006). Report on Causes and Consequences of Early Marriage in Amhara Region. *Health (San Francisco)*.
- Pettifor, A. E., van der Straten, A., Dunbar, M. S., Shiboski, S. C., & Padian, N. S. (2004a). Early age of first sex. *Aids*, 18(10), 1435–1442. <https://doi.org/10.1097/01.aids.0000131338.61042.b8>
- Pettifor, A. E., van der Straten, A., Dunbar, M. S., Shiboski, S. C., & Padian, N. S. (2004b). Early age of first sex. *Aids*. <https://doi.org/10.1097/01.aids.0000131338.61042.b8>
- Pratley, P. (2016). Associations between quantitative measures of women’s empowerment and access to care and health status for mothers and their children: A systematic review of evidence from the developing world. *Social Science and Medicine*. <https://doi.org/10.1016/j.socscimed.2016.08.001>
- Rafferty, Y. (2013). International Dimensions of Discrimination and Violence against Girls: A Human Rights Perspectives. *Journal of Interpersonal Violence*. <https://doi.org/10.1080/08862605.2013.788888>
- Roura, M., Urassa, M., Busza, J., Mbata, D., Wringe, A., & Zaba, B. (2009). Scaling up stigma? The effects of antiretroviral roll-out on stigma and HIV testing. Early evidence from rural Tanzania. *Sexually Transmitted Infections*. <https://doi.org/10.1136/sti.2008.033183>
- Rowlands, J. (1995). Empowerment Examined. *Development in Practice*. <https://doi.org/10.1080/0961452951000157074>
- Sano, Y., Sedziafa, A. P., Amoyaw, J. A., Boateng, G. O., Kuuire, V. Z., Boamah, S., & Kwon, E. (2016). Exploring the linkage between exposure to mass media and HIV testing among married women and men in Ghana. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*. <https://doi.org/10.1080/09540121.2015.1131970>

- Siziya, S., Muula, A. S., Rudatsikira, E., & Mataya, R. H. (2008). Correlates of HIV testing among women in Malawi: Results from the 2006 Multiple Indicator Cluster Survey. *Tropical Medicine and International Health*. <https://doi.org/10.1111/j.1365-3156.2008.02155.x>
- Tekletsadik, E., Fantahun, M., & Shaweno, D. (2014). Is community conversation associated with human immunodeficiency virus voluntary counseling and testing service uptake in rural communities in Ethiopia? A comparative cross-sectional study. *North American Journal of Medical Sciences*. <https://doi.org/10.4103/1947-2714.127741>
- Tenkorang, E. Y., & Owusu, G. A. (2010). Correlates of HIV testing among women in Ghana: Some evidence from the Demographic and Health Surveys. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*. <https://doi.org/10.1080/09540120903193716>
- Testing, H. I. V., & Initiation, A. R. T. (2010). Toward Universal Access to HIV Counseling and Testing and Antiretroviral Treatment in Ethiopia : Looking Beyond, 24(8). <https://doi.org/10.1089/apc.2009.0286>
- Türmen, T. (2003). Gender and HIV/AIDS. *International Journal of Gynecology and Obstetrics*. [https://doi.org/10.1016/S0020-7292\(03\)00202-9](https://doi.org/10.1016/S0020-7292(03)00202-9)
- UN General Assembly. (1989). Convention on the Rights of a Child. *United Nations, Treaty Series*. <https://doi.org/10.2307/4065371>
- United Nations. (2015). The world's women 2015 : Trends and Statistics.
- United Nations Department of Economics and Social Affairs. (2010). *The World's Women 2010. Trends and Statistics*. United Nations Department of Economics and Social Affairs. <https://doi.org/ST/ESA/STAT/SER.K/19>
- Vandemoortele, J., & Delamonica, E. (2014). The " education vaccine " against HIV, (April).
- Vidanapathirana, J., Abramson, M. J., Forbes, A., & Fairley, C. (2005). Mass media interventions for promoting HIV testing. *Cochrane Database of Systematic Reviews*. <https://doi.org/10.1002/14651858.cd004775.pub2>
- Wado, Y. D. (2018). Women's autonomy and reproductive health-care-seeking behavior in Ethiopia. *Women and Health*. <https://doi.org/10.1080/03630242.2017.1353573>
- Walsemann, K. M., Goosby, B. J., & Farr, D. (2016). Life course SES and cardiovascular risk: Heterogeneity across race/ethnicity and gender. *Social Science & Medicine*, 152, 147–155.
- Weiss, E., Whelan, D., & Gupta, G. R. (2000). Gender, sexuality and HIV: Making a difference in the lives of young women in developing countries. *Sexual and Relationship Therapy*. <https://doi.org/10.1080/14681990050109836>
- WHO, UNICEF, U. and T. W. B. (2010). Trends in Maternal Mortality : 1990 to 2010. *Organization*. <https://doi.org/ISBN 978 92 4 150363 1>

WHO. (2010). Addressing the Challenge of Women ' s Health in Africa. Retrieved from http://www.afro.who.int/index.php?option=com_content&view=article&id=2049&Itemid=841

World Health Organization. (2003). Gender and HIV/AIDS Gender and HEALTH. *International Journal of Gynecology & Obstetrics*. [https://doi.org/DOI:10.1016/S0020-7292\(03\)00202-9](https://doi.org/DOI:10.1016/S0020-7292(03)00202-9)

World Health Organization. (2012). Addressing the challenge of women's health in Africa. Report on the Commission on women's health in the African Region.

Table 4.1 Characteristics of study sample (n =8681) by HIV testing

Characteristic	Number (weighted %)	Ever tested for HIV		P-value
		NO	Yes	
Health care decision making				< 0.001
Don't participate	1539 (18.5%)	823 (59.5%)	716 (40.5%)	
Do participate	7142 (81.5%)	2911 (45.4%)	4231(54.6%)	
Age				< 0.001
15-24	2167 (22.3%)	903 (44.3%)	1264 (55.7%)	
25-39	3636 (44.1%)	1443 (45.3%)	2193 (54.7%)	
40 -49	2878 (33.6%)	1388 (54%)	1490 (46%)	
Wealth				< 0.001
Poor	3571 (37.1%)	2272 (64.3%)	1299 (35.7%)	
Middle	1242 (20.3%)	613 (55.9%)	629 (44.1%)	
Rich	3868 (42.6%)	849 (30%)	3019 (70%)	
Education				< 0.001
No Education	4783 (59.4%)	2787 (59.3%)	1996 (40.7%)	
Primary	2526 (29.4%)	826 (39.9%)	1700 (60.1%)	
Secondary and Above	1372 (11.2%)	121 (9.8%)	1251 (90.2%)	
Marital status				
Married/living with Partner	8681 (100%)	N/A	N/A	N/A
Residence				< 0.001
Urban	2356 (17.20%)	303 (13.1%)	2053 (86.9%)	
Rural	6325 (82.80%)	3431 (55.2%)	2894 (44.8%)	
Living arrangement				< 0.001
Living with her	7586 (92%)	3281 (49%)	4305 (51%)	
Staying Elsewhere	1095 (8%)	453 (37%)	642 (63%)	
Tested for HIV				N/A
No	3734 (48%)	N/A	N/A	
Yes	4947 (52%)	N/A	N/A	
Respondent currently working				< 0.001
NO	5779 (68.6%)	2765 (52.5%)	3014 (47.5%)	
Yes	2902 (31.4%)	969 (38.1%)	1933 (61.9%)	
Husband Currently working				0.086
No	2049 (22.9%)	1034 (51%)	1015 (49%)	

Yes	6632 (77.1%)	2700 (47.1%)	3932 (52.9%)	
Husband Education				< 0.001
None	3705 (44.9%)	2195 (58.4%)	1510 (41.6%)	
Primary	2827 (37.5%)	1142 (47.9%)	1685 (52.1%)	
Secondary and above	2149 (17.7%)	397 (22%)	1752 (78%)	
Age at first sex				< 0.001
1 thr 14	1772 (23.1%)	841 (53.3%)	931 (46.7%)	
15 thru 17	3847 (43.3%)	1799 (49.3%)	2048 (50.7%)	
18 and above	3062 (33.6%)	1094 (42.6%)	1968 (57.4%)	
Know a place to get tested				< 0.001
No	1847 (25.5%)	1847 (100%)	N/A	
Yes	6834 (74.5%)	1887 (30.2%)	4947 (69.8%)	
Comprehensive HIV knowledge				< 0.001
No	7093 (82.3%)	3412 (52.1%)	3681 (47.9%)	
Yes	1588 (17.7%)	322 (29%)	1266 (71%)	
Discriminatory attitude towards people living with HIV				< 0.001
No	3120 (28.1%)	685 (25.7%)	2435 (74.3%)	
Yes	5561 (71.9%)	3049 (56.7%)	2512 (43.3%)	
Media Access				< 0.001
Limited or None	6234 (76.9%)	3279 (55.2%)	2955 (44.8%)	
At least once a week	2447 (23.1%)	455 (24%)	1992 (76%)	

Table 4.2 Logistic Regression Analysis

Characteristic	Adjusted Odds Ratio (95% confidence Interval)	P-value
Healthcare decision making		
Don't participate	0.77 (0.63 - 0.94)	< 0.001
Do participate	1	
Age		
15-24	1.28 (0.98 - 1.52)	0.082
25-39	1.28 (1.08 - 1.50)	0.003
40 -49	1	
Wealth		
Poor	0.48 (0.39 - 0.60)	<0.001
Middle	0.64 (0.51 - 0.80)	<0.001
Rich	1	
Education		
No Education	0.299 (0.20 - 0.43)	<0.001
Primary	0.45 (0.32 - 0.65)	<0.001
Secondary and Above	1	
Marital status		
Married/living with Partner	N/A	N/A
Residence		
Urban	2.30 (1.71 - 3.36)	<0.001
Rural	1	
Living arrangement		
Living with her	0.77 (0.61 - 0.99)	0.039
Staying Elsewhere	1	
Respondent currently working		
NO	0.82 (0.69 - 0.97)	0.018
Yes	1	
Husband Currently working		
No	1.09 (0.89 - 1.33)	0.38
Yes	1	

Husband Education		
None	1.02 (0.79 - 1.32)	0.88
Primary	1.00 (0.77 - 1.30)	0.99
Secondary and Above	1	
Age at first sex		
1 thr 14	1.06 (0.86 - 1.31)	0.58
15 thru 17	1.08 (0.91 - 1.27)	0.39
18 and above	1	
Comprehensive HIV knowledge		
No	0.71 (0.58 - 0.88)	0.002
Yes	1	
Discriminatory attitude towards people living with HIV		
No	1.79 (1.48 - 2.17)	< 0.001
Yes	1	
Media Access		
Limited or None	0.76 (0.59 - 0.99)	0.042
At least once a week or more	1	

4.2 Manuscript 2

Associations between intimate partner violence, HIV serostatus, and HIV testing uptake among Ethiopian women: Results from a population-based analysis²

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Abstract

HIV testing serves as a gateway to disease prevention, detection, and treatment. Prior research has identified several socio-economic, cultural and organizational factors associated with HIV testing, but has not examined the link between intimate partner violence (IPV) and HIV testing uptake among women. Guided by the Anderson Behavioral model for variable selection and analysis, this study examined the association between emotional violence, one form of IPV, and HIV testing uptake among Ethiopian women, using data collected through the 2016 Ethiopian Demographic and Health Survey (DHS). Included in this analysis was a subset of 3,637 of the larger sample of 15,683 women between the ages of 15 and 49 years. In the bivariate analysis, emotional violence, reported by 42.6% of respondents, was associated with prior HIV testing. However, in the multiple logistic regression model that adjusted for socio-economic and other covariates, emotional violence did not independently predict HIV testing uptake among women ($p > 0.05$). The findings suggest that efforts to improve women's socio-economic status (i.e., through education and income-generation) and decision-making autonomy may be more relevant to increasing HIV testing uptake among Ethiopian women.

Introduction

Worldwide, nearly one third of women have experienced some form of physical or sexual violence by either an intimate partner or non-intimate partner, at some point in their lives (United Nations, 2015). Intimate partner violence, also referred to as family, domestic, or interpersonal violence, refers to any combination of physical, emotional, and sexual abuse between family members and/or intimate partners, who may or may not be living together (Fuentes, 2008). The broad term *violence against women* encompasses domestic violence, child marriage, forced pregnancy, honor crimes, female genital mutilation, femicide, sexual and other violence perpetrated by someone other than an intimate partner, sexual harassment, trafficking in women and violence in conflict situations (United Nations, 2015). Several International Human Rights Conventions exist to protect the human rights of women and girls. The United Nations Beijing Platform for Action pledges to eliminate all forms of discrimination against girls. The Convention on the Rights of the Child (UN General Assembly, 1989) established the economic, political, civil, social and cultural rights of all children, both girls and boys. Furthermore, the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) adopted by the United Nations in 1979 set out core principles to protect those rights (CEDAW; UN General Assembly, 1979).

Following suite, individual countries have instituted appropriate legal and policy frameworks to promote the rights of women and girls. In Ethiopia, beyond the inclusion of these rights in the constitution, the government also has ratified many of the international and continental conventions that promote women's rights including CEDAW, and the protocol to the African Charter on the Rights of Women in Africa (Ethiopian Demographic

and Health Survey 2016 Team, 2016). Other specific legal measures and actions taken to address violence against women include revisions to the national Family Law in 2000 and to the Criminal Code in 2005. Despite these diverse efforts, violence against women and girls continues to be a major challenge and a threat to women's empowerment in Ethiopia (EDHS 2016 Team, 2016).

Intimate partner violence is the most common form of violence throughout the world and is often at its peak during women's reproductive years (United Nations, 2015). Available data indicate the highest levels of physical violence against women occur in Africa (United Nations, 2015). Findings from a study conducted by the World Health Organization (WHO) that analyzed data from two predominantly rural areas in Ethiopia (i.e., Southern Nations Nationalities and People's Region) indicated 71 % of female respondents had suffered physical or sexual violence by a male partner (Pathfinder, 2006).

Violence against women fuels HIV risk through multiple pathways. Foremost, violence may increase a woman's risk for HIV infection through forced or coerced sex and by limiting her ability to negotiate HIV prevention behaviors (WHO, 2010). Furthermore, physical and sexual abuse during childhood has been associated with high risk-taking behavior in adolescence and adulthood (Maman et al., 2000). Notably, Fuentes (2008) noted evidence that women who were sexually abused as children tend to be depressed and may demonstrate affection-seeking behaviors that increases their sexual risk. Similarly, Dunkle and colleagues (2004b) noted the association between having experienced child sexual assault and women's likelihood of engaging sex for money or drugs. The threat of violence also is likely to impair women's power and ability to negotiate the conditions of sexual intercourse, especially condom use (World Health Organization, 2003).

Although the relationship between HIV and violence is well established in the literature, to date no published research has assessed the association between HIV testing and the experience of violence among women. An effort to fill that knowledge gap, this research assessed the correlation between spousal emotional violence and HIV testing among Ethiopian women. To that end, variable selection was guided by the revised Gelberg-Anderson-Leake behavioral model (2000), an updated version of the original Anderson Behavioral model (Aday & Andersen, 1974). The revised model, which includes vulnerable populations, provides a useful framework to examine characteristics associated with health service utilization (Gelberg, Andersen, & Leake, 2000). The three main elements in the model are the individual's predisposing characteristics, enabling resources and need. Predisposing characteristics, such as education, age, marital status and religion, influence the likelihood of individuals to take up a health-related service. Enabling resources include income, health insurance, and other resources (i.e., relevant information, available transportation) that facilitate access and utilization. The need for care is the third related to health service utilization (Aday & Andersen, 1974).

Method

The Ethiopian Demographic and Health Survey (EDHS, 2016) served as the data source for the analysis. The EDHS sample was determined using a two-stage stratified cluster sampling design. In the first stage, enumeration areas (EA) were selected with probability proportional to the EA size and with independent selection in each sampling stratum. In the second stage, 28 households per cluster were selected with an equal probability systematic selection. Participants included 12,688 Ethiopian men between the ages of 15 and 59 and 15,683 Ethiopian women between the ages of 15 and 49. The sub-

sample for this analysis consisted of all currently married women who completed the domestic violence questionnaire. Excluded from the analysis were participants with missing data on the question related to emotional violence and other covariates adjusted in the multiple logistic regression. The final study sample consisted of 3,637 female participants.

Measurement

The main outcome variable, ever been tested for HIV, was assessed by a yes/no response option. Other demographic and non-demographic variables were included to measure association between these variables and the outcome variable. Sociodemographic variables included education, wealth, employment, residence, and living arrangement. Agency was measured by assessing household decision making participation of women. The main dependent variable was emotional spousal violence. It was assessed by participants' indication if they had ever been humiliated, threatened with harm, and/or insulted or made to feel bad by a husband/partner. There were five response options: never; often; sometimes; yes, but not in the last 12 months; and yes, frequently in last 12 months. This variable was dummy coded so that those who said, "never experienced" were coded as having "no experience" and those who responded otherwise were coded as "Have some experience." Based on findings from previous studies (Alemu et al., 2017), the following variables were adjusted in the multivariate logistic regression model: comprehensive HIV knowledge, discriminatory attitudes towards people living with HIV, knowing a place to get tested, and media access.

Data analysis

Statistical analysis was performed using SPSS version 24. The first step was to calculate frequencies for each variable. Subsequently, the association between the dependent and independent variables was assessed using the Rao Scott chi-square test statistic (χ^2), followed by multivariate logistic regression that adjusted for all the covariates. Two tailed P-value $<.05$ was considered statistically significant. Sampling weights that accounted for complex survey design were incorporated in all analyses.

Results

The study sample included 3,637 adult Ethiopian women between the ages of 15 to 49 who were either married or living with a partner at the time of data collection. The predominant age group was women between the ages of 25 to 39 (45.3%). Of note, 68.6% reported active participation in household decision-making. The majority (82.9%) resided in rural areas and had no formal schooling (60%). Although only 33% reported being currently employed, 42% of the participants (households) belong in the rich household wealth category, based on housing characteristics and the number and kinds of consumer goods they own. Only 23% reported having experienced spousal/partner emotional violence. A little over half (51%) of the participants reported having tested for HIV at some point in the past.

Results of the bivariate analysis to assess the relationship between each dependent variable and the outcome variable are presented in Table 4.3. Except for age and husband's current employment status, there was a significant association between all covariates and having reported ever having been tested for HIV. These covariates included household

decision making, emotional violence, wealth, educational attainment, residence, living arrangement, respondent's employment status, husband's education, age at first sex, knowing a place to get tested, comprehensive HIV knowledge, discriminatory attitude towards people living with HIV, and media access.

Of note, however, HIV testing experiences varied across the sample. For example, the HIV testing experience was higher (55.6%) among women who participated in household decisions than those who did not (41.2%). Likewise, having ever been tested for HIV was higher among those who did not experience emotional violence (53.6%), urbanites (87%), those who were wealthier (68.8%), and those who had a secondary level education or more (90.8%). HIV testing also differed by husband's educational status, with women married to men with a secondary education or more being the most likely (73.6%) to have ever been tested.

Table 4.4 presents the results of the multivariate logistic regression. The analysis indicated a woman's participation in household decision making, her residential location, wealth and education, and her husband's educational level were all positively associated with her having ever been tested for HIV. In contrast, there was no statistically significant association between the following variables and HIV testing: age, living arrangement, employment status of both respondent and partner/husband, age at first sex, and reported emotional violence.

Compared to women who participate in household decision making, those who did not were less likely to have ever been tested (AOR 0.71, 95% CI 0.55- 0.93). Compared to rich women, poor women were less likely to have ever been tested (AOR 0.53, 95% CI 0.39 – 0.72). Similarly, women without education were less likely to test (AOR 0.22, 95%

CI 0.11- 0.42) compared to those who had secondary level and above education. Urban women were twice more likely (AOR 2.70, 95% CI 1.83 – 3.98) to test for HIV than rural women. Of note, women married to a man with no formal education, were nearly 50% (AOR 1.49, 95% CI 1.01 – 2.20) *more likely* to have ever undergone HIV testing than women whose husband/partner had completed secondary education or above.

Discussion

Prior research has established the association between different forms of spousal violence and HIV (MacQuarrie, Winter, & Kishor, 2013) and the significantly higher prevalence of violence among HIV positive women in Sub-Saharan Africa (Dunkle et al., 2004a). Findings from other research conducted in Sub-Saharan Africa indicate the prevalence of violence suffered by HIV positive women is higher than that among HIV negative (Dunkle et al., 2004a). Prior research indicates an association between women's HIV status and their experience of sexual or physical violence (Suzanne Maman et al., 2002), spousal control, and any type of intimate partner violence (Dunkle et al., 2004a). Furthermore, findings from other population based cross-sectional studies indicate significant association between intimate partner violence and HIV status (MacQuarrie et al., 2013). The contribution of this research is to expand the field by examining the relationship between violence and HIV testing among Ethiopian women using a nationally representative sample.

Psychological violence includes a range of behaviors that encompass acts of emotional abuse and controlling behaviors (United Nations, 2015). These acts often exist alongside physical and sexual violence by intimate partners and are acts of violence in themselves (United Nations, 2015). Among the respondents in this study, 23 % reported

having experienced emotional violence from a spouses or partner. Emotional violence may include the act of insulting or making a woman feel bad about herself, belittling or humiliating her in front others, deliberately scaring or intimidating her, or threatening to hurt her or others she cares (Central Statistical Agency [Ethiopia] and ICF International, 2016).

Gender-based violence increases inequalities and is an important cause of choice disability. This refers to the inability of those affected by gender-based violence to take prevention decisions (Andersson, Cockcroft, & Shea, 2008). Contrary to our hypothesis, experience of emotional violence was not associated with HIV testing among Ethiopian women although the two were significantly associated in the bivariate analysis. This may be because other covariates which were adjusted in the model were more important in determining women's HIV testing than the experience of violence alone. One plausible explanation for this is the fact that more women in the study participated in household decision making and those who did were more likely to have been tested for HIV.

This research also demonstrated the importance of socio-economic status in determining HIV testing. For example, HIV testing increased with better educational attainment. The relationship between education and HIV testing, however, is not consistent across studies in sub-sahran Africa and warrants further investigation. Whereas research conducted by Siziya and colleagues (Siziya, Muula, Rudatsikira, & Mataya, 2008) indicated no association between socio-economic status and HIV testing, others have demonstrated an inverse relationship between education and HIV testing (Luseno & Wechsberg, 2009).

Economic status was also an important correlate of HIV testing. Particularly, being poor was associated with the decreased likelihood of HIV testing in the current study. In most sub-Saharan countries, the direct and indirect costs of accessing testing services inhibit uptake of HIV testing regardless of the expanding free HIV testing services (Musheke et al., 2013). In areas where HIV testing is offered free of cost, among economically poor women, other deterrents to uptake may include the potential economic loss due to suspension of income generating activities and the need to taking time-off from employment. In places where there is no direct cost related to HIV testing, individuals may consider other competing responsibilities and/or needs.

Finally, having a rural residence was inversely associated with HIV testing among women. Studies show the persistent centralization of HIV treatment services in many settings worldwide reducing the success of HIV treatment programs (Joint United Nations Program on HIV/AIDS, 2014). These findings suggest the need to further examine expansion of services in rural areas by strengthening community systems through decentralization and community-based HIV treatment delivery (Joint United Nations Program on HIV/AIDS, 2014). Additionally, tailoring service delivery to key populations, such as rural women, using alternative means such as HIV - self testing may be useful.

The findings from this research should be interpreted within the context of several limitations. These include respondent self-report and the cross-sectional design. Thus, the findings should be considered as possibly influenced by participant's perceived social desirability and should not be considered as inferring causality. It is possible that participants may have withheld information for fear of social judgment. Other possible limitations include recall bias, given that participants were asked to go back in time to

recall events from the past. Another limitation is that the analysis did not take into consideration HIV risk behaviors of the actual participant women or their husbands/partners. Finally, given that all study participants were either married or living with a partner at the time of the data collection, the findings are not generalizable to the broader population of study, Ethiopian women.

Recommendations

Several recommendations may be drawn from this research. One recommendation is for health and social policy makers to consider women's personal and family decision-making powers. In many communities, this will require efforts to change or modify cultural norms through educational outreach, mass media campaigns, and community engagement. It will also require offering a wider variety of opportunities and choices for women, beyond the domestic sphere. This will demand expansion of enrollment and retention of girls and women in secondary and tertiary level education. Women's increased access to economic resources, through either outside employment or domestic income generating activities such as microfinance, would likely increase their self-sufficiency and propensity to make individual health decisions, including uptake of HIV testing. Finally, expansion of community-based HIV testing services, distribution of affordable HIV self-testing kits, and enhanced outreach services to rural women are essential components of HIV testing scale-up.

References

Aday, L. A., & Andersen, R. (1974). A framework for the study of access to medical care. *Health Services Research*.

Alemu, Y. M., Ambaw, F., & Wilder-Smith, A. (2017). Utilization of HIV testing services among pregnant mothers in low income primary care settings in northern Ethiopia: A cross sectional study. *BMC Pregnancy and Childbirth*.
<https://doi.org/10.1186/s12884-017-1389-2>

Andersson, N., Cockcroft, A., & Shea, B. (2008). Gender-based violence and HIV: Relevance for HIV prevention in hyperendemic countries of southern Africa. *AIDS*.
<https://doi.org/10.1097/01.aids.0000341778.73038.86>

Avert. (2017). Global HIV and AIDS statistics | AVERT. *Avert*.
<https://doi.org/10.1596/1813-9450-6869>

Ayenew, A., Leykun, A., Colebunders, R., & Deribew, A. (2010). Predictors of HIV testing among patients with tuberculosis in North West Ethiopia: A case-control study. *PLoS ONE*. <https://doi.org/10.1371/journal.pone.0009702>

Bago, J. L., & Lompo, M. L. (2019). Exploring the linkage between exposure to mass media and HIV awareness among adolescents in Uganda. *Sexual and Reproductive Healthcare*. <https://doi.org/10.1016/j.srhc.2019.04.004>

Balcha, T. T., Lecerof, S. S., & Jeppsson, A. R. (2011). Strategic challenges of PMTCT program implementation in ethiopia. *Journal of the International Association of Physicians in AIDS Care*. <https://doi.org/10.1177/1545109710369935>

- Bashemera, D. R., Nhembo, M. J., & Benedict, G. (2013). The role of women's empowerment in influencing HIV testing . *DHS Working Papers No. 101* .
- Batliwala, S. (2007). Taking the power out of empowerment - An experiential account. *Development in Practice*. <https://doi.org/10.1080/09614520701469559>
- Berry, M. E. (2015). When “Bright Futures” Fade: Paradoxes of Women's Empowerment in Rwanda. *Signs: Journal of Women in Culture and Society*. <https://doi.org/10.1086/681899>
- Bradley, H., Tsui, A., Kidanu, A., & Gillespie, D. (2011). Client characteristics and HIV risk associated with repeat HIV testing among women in Ethiopia. *AIDS and Behavior*. <https://doi.org/10.1007/s10461-010-9765-1>
- Burnet, J. E. (2007). *Jefremovas Villia. Brickyards to Graveyards: From Production to Genocide in Rwanda*. Albany, N.Y.: State University of New York Press, 2002. xi + 162 pp. Illustrations. Maps. Photographs. Appendixes. Notes. Bibliography. Index. \$21.95. Paper. *African Studies Review*. <https://doi.org/10.1353/arw.2005.0096>
- Buvé, A., Bishikwabo-Nsarhaza, K., & Mutangadura, G. (2002). The spread and effect of HIV-1 infection in sub-Saharan Africa. *Lancet*. [https://doi.org/10.1016/S0140-6736\(02\)08823-2](https://doi.org/10.1016/S0140-6736(02)08823-2)
- Castle, S. (2003). Doubting the existence of AIDS: A barrier to voluntary HIV testing and counselling in urban Mali. *Health Policy and Planning*. <https://doi.org/10.1093/heapol/czg019>
- CDC. (2018). About HIV/AIDS | HIV Basics | HIV/AIDS | CDC.

CEDAW; UN General Assembly. Convention on the Elimination of All Forms of Discrimination against Women., Annual review of population law § (1979).

<https://doi.org/10.1093/oxfordhb/9780199560103.003.0005>

Central Statistical Agency [Ethiopia] and ICF International. (2016). *Ethiopian Demographic and Health Survey 2016 Key Indicators Report. Ethiopians Water Sector Development Program.*

Chirawu, P., Langhaug, L., Mavhu, W., Pascoe, S., Dirawo, J., & Cowan, F. (2010). Acceptability and challenges of implementing voluntary counselling and testing (VCT) in rural Zimbabwe: Evidence from the Regai Dzive Shiri Project. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV.*

<https://doi.org/10.1080/09540120903012577>

Cohen, M. S., Chen, Y. Q., McCauley, M., Gamble, T., Hosseinipour, M. C., Kumarasamy, N., ... Fleming, T. R. (2015). Final results of the HPTN 052 randomized controlled trial: antiretroviral therapy prevents HIV transmission. *Journal of International Aids Society.* <https://doi.org/10.7448/IAS.18.5.20482>

Dellar, R. C., Dlamini, S., & Karim, Q. A. (2015). Adolescent girls and young women: Key populations for HIV epidemic control. *Journal of the International AIDS Society.* <https://doi.org/10.7448/IAS.18.2.19408>

Demissie, A., Deribew, A., & Abera, M. (2006). Determinants of acceptance of voluntary HIV testing among antenatal clinic attendees at Dil Chora Hospital , Dire Dawa ,.

Department of Economic and Social Affairs. (2010). *The World's Women 2010 - Trends and Statistics. United Nations Department of Economic and Social Affairs.*

<https://doi.org/ST/ESA/STAT/SER.K/19>

Deressa, W., Seme, A., Asefa, A., Teshome, G., & Enqusellassie, F. (2014). Utilization of PMTCT services and associated factors among pregnant women attending antenatal clinics in Addis Ababa, Ethiopia. *BMC Pregnancy and Childbirth*. <https://doi.org/10.1186/1471-2393-14-328>

Dunkle, K. L., Jewkes, R. K., Brown, H. C., Gray, G. E., McIntyre, J. A., & Harlow, S. D. (2004a). Gender-based violence, relationship power, and risk of HIV infection in women attending antenatal clinics in South Africa. *Lancet*. [https://doi.org/10.1016/S0140-6736\(04\)16098-4](https://doi.org/10.1016/S0140-6736(04)16098-4)

Dunkle, K. L., Jewkes, R. K., Brown, H. C., Gray, G. E., McIntyre, J. A., & Harlow, S. D. (2004b). Transactional sex among women in Soweto, South Africa: prevalence, risk factors and association with HIV infection. *Social Science & Medicine*, *59*(8), 1581–1592.

Ebrahim, N. B., & Atteraya, M. S. (2018). Women's Decision-Making Autonomy and their Attitude towards Wife-Beating: Findings from the 2011 Ethiopia's Demographic and Health Survey. *Journal of Immigrant and Minority Health*. <https://doi.org/10.1007/s10903-017-0592-6>

EDHS 2016 Team. (2016). Ethiopian Demographic and Health Survey. *Report*.

Erulkar, A., & Ab Mekbib, T. (2007). Invisible and vulnerable: Adolescent domestic workers in Addis Ababa, Ethiopia. *Vulnerable Children and Youth Studies*. <https://doi.org/10.1080/17450120701487857>

- Facha, W., Kassahun, W., & Workicho, A. (2016). Predictors of provider- initiated HIV testing and counseling refusal by outpatient department clients in Wolaita zone, Southern Ethiopia: A case control study. *BMC Public Health*. <https://doi.org/10.1109/WIRLES.2005.1549530>
- FAWE. (2017). Girls' Education in Sub-Saharan Africa.
- Fetene, N. W., & Feleke, A. D. (2010). Missed opportunities for earlier HIV testing and diagnosis at the health facilities of Dessie town, North East Ethiopia. *BMC Public Health*. <https://doi.org/10.1186/1471-2458-10-362>
- Frank, E. (2009). The relation of HIV testing and treatment to identity formation in Zambia. *African Journal of AIDS Research*. <https://doi.org/10.2989/AJAR.2009.8.4.15.1052>
- Fuentes, C. M. M. (2008). Pathways from Interpersonal Violence to Sexually Transmitted Infections: A Mixed-Method Study of Diverse Women. *Journal of Women's Health*. <https://doi.org/10.1089/jwh.2008.0885>
- Gelberg, L., Andersen, R. M., & Leake, B. D. (2000). The Behavioral Model for Vulnerable Populations: application to medical care use and outcomes for homeless people. *Health Services Research*.
- Grant, E., Logie, D., Masura, M., Gorman, D., & Murray, S. A. (2008). Factors facilitating and challenging access and adherence to antiretroviral therapy in a township in the Zambian Copperbelt: A qualitative study. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*. <https://doi.org/10.1080/09540120701854634>

- Gregson, S., Waddell, H., & Chandiwana, S. (2001). School education and HIV control in sub-Saharan Africa: From discord to harmony? *Journal of International Development*, 13(4), 467–485. <https://doi.org/10.1002/jid.798>
- Gupta, G. R. (2000). Gender, sexuality, and HIV/AIDS: the what, the why, and the how. *Canadian HIV/AIDS Policy & Law Review*. <https://doi.org/10.1016/j.jcct.2007.12.012>
- Heise, L. L., & Elias, C. (1995). Transforming AIDS prevention to meet women's needs: A focus on developing countries. *Social Science and Medicine*. [https://doi.org/10.1016/0277-9536\(94\)00165-P](https://doi.org/10.1016/0277-9536(94)00165-P)
- International, C. S. A. [Ethiopia] and I. (2012). Ethiopia Demographic and Health Survey 2011. *Health San Francisco*. <https://doi.org/978-92-1-101320-7>
- Izugbara, C. O., Undie, C. C., Mudege, N. N., & Ezeh, A. C. (2009). Male youth and voluntary counseling and HIV-testing: The case of Malawi and Uganda. *Sex Education*. <https://doi.org/10.1080/14681810903059078>
- Jerene, D., Endale, A., & Lindtjørn, B. (2007). Acceptability of HIV counselling and testing among tuberculosis patients in south Ethiopia. *BMC International Health and Human Rights*. <https://doi.org/10.1186/1472-698X-7-4>
- Joint United Nations Program on HIV/AIDS. (2014). Treatment 2020 90-90-90 to help end the AIDS epidemic. *United Nations*.
- Kabeer, N. (1999a). Resources, agency, achievements: Reflections on the measurement of women's empowerment. *Development and Change*. <https://doi.org/10.1111/1467->

7660.00125

Kabeer, N. (1999b). Resources , Agency , Achievements : Reflections on the Measurement of Women ' s Empowerment, *30*(May), 435–464.

Kabeer, N. (2005). Gender equality and women's empowerment: A critical analysis of the third Millennium Development Goal. *Gender and Development*.
<https://doi.org/10.1080/13552070512331332273>

Kaiser Family Foundation. (2016). The Global HIV / AIDS Epidemic: Fact Sheet. *The Henry Kaiser Family Foundation*.

Kharsany, A. B. M., & Karim, Q. A. (2016). HIV Infection and AIDS in Sub-Saharan Africa: Current Status, Challenges and Opportunities. *The Open AIDS Journal*.
<https://doi.org/10.2174/1874613601610010034>

Khumalo, K. E., McKay, K. H., & Freimund, W. (2015). Who is a “real woman”? Empowerment and the discourse of respectability in Namibia's Zambezi region. *Women's Studies International Forum*. <https://doi.org/10.1016/j.wsif.2014.10.002>

Kim, J. C., Watts, C. H., Hargreaves, J. R., Ndhlovu, L. X., Phetla, G., Morison, L. A., ... Pronyk, P. (2007). Understanding the impact of a microfinance-based intervention on women's empowerment and the reduction of intimate partner violence in South Africa. *American Journal of Public Health*.
<https://doi.org/10.2105/AJPH.2006.095521>

Kosack, C. S., Page, A. L., Beelaert, G., Benson, T., Savane, A., Ng'Ang'A, A., ... Fransen, K. (2017). Towards more accurate HIV testing in sub-Saharan Africa: A

multi-site evaluation of HIV RDTs and risk factors for false positives. *Journal of the International AIDS Society*. <https://doi.org/10.7448/IAS.20.1.21345>

Larsson, E. C., Thorson, A., Nsabagasani, X., Namusoko, S., Popenoe, R., & Ekström, A. M. (2010). Mistrust in marriage-Reasons why men do not accept couple HIV testing during antenatal care - A qualitative study in eastern Uganda. *BMC Public Health*. <https://doi.org/10.1186/1471-2458-10-769>

Link, B. G., & Phelan, J. (2006). Social Conditions As Fundamental Causes of Disease. *Journal of Health and Social Behavior*. <https://doi.org/10.2307/2626958>

Luginaah, I. N., Yiridoe, E. K., & Taabazuing, M. M. (2005). From mandatory to voluntary testing: Balancing human rights, religious and cultural values, and HIV/AIDS prevention in Ghana. *Social Science and Medicine*. <https://doi.org/10.1016/j.socscimed.2005.03.034>

Luseno, W. K., & Wechsberg, W. M. (2009). Correlates of HIV testing among South African women with high sexual and substance-use risk behaviours. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*. <https://doi.org/10.1080/09540120802017594>

Mabunda, G. (2006). Voluntary HIV Counseling and Testing: Knowledge and Practices in a Rural South African Village. *Journal of Transcultural Nursing*. <https://doi.org/10.1177/1043659605281978>

MacQuarrie, K. L. D., Winter, R., & Kishor, S. (2013). Spousal Violence and HIV: Exploring the Linkages in Five Sub-Saharan African Countries. *DHS Analytical Study No 36*.

- Malhotra, A., Schuler, S. R., & Boender, C. (2002). Women's empowerment as a variable in international development. *Measuring Empowerment: Cross-Disciplinary Perspectives*. <https://doi.org/10.1596/0-8213-6057-4>
- Maman, S., Campbell, J., Sweat, M. D., & Gielen, A. C. (2000). The intersections of HIV and violence: directions for future research and interventions 10.1016/S0277-9536(99)00270-1 : Social Science & Medicine | ScienceDirect.com, 50.
- Maman, S., Mbwambo, J., Hogan, N. M., Kilonzo, G. P., & Sweat, M. (2001). Women's barriers to HIV-1 testing and disclosure: Challenges for HIV-1 voluntary counselling and testing. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*. <https://doi.org/10.1080/09540120120063223>
- Maman, S., Mbwambo, J. K., Hogan, N. M., Kilonzo, G. P., Campbell, J. C., Weiss, E., & Sweat, M. D. (2002). HIV-positive women report more lifetime partner-violence: Findings from a voluntary counseling and testing clinic in Dar es Salaam, Tanzania. *American Journal of Public Health*. <https://doi.org/10.2105/AJPH.92.8.1331>
- Mane, P., & Aggleton, P. (2001). Gender and HIV/AIDS: What Do Men have to Do with it? *Current Sociology*. <https://doi.org/10.1177/0011392101496005>
- Mavedzenge, S. N., Baggaley, R., & Corbett, E. L. (2013). A review of self-testing for HIV: Research and policy priorities in a new era of HIV prevention. *Clinical Infectious Diseases*. <https://doi.org/10.1093/cid/cit156>
- Meiberg, A. E., Bos, A. E. R., Onya, H. E., & Schaalma, H. P. (2008). Fear of stigmatization as barrier to voluntary HIV counselling and testing in South Africa. *East African Journal of Public Health*.

- Mosedale, S. (2005). Assessing women's empowerment: Towards a conceptual framework. *Journal of International Development*. <https://doi.org/10.1002/jid.1212>
- Mukolo, A., & Villegas, R. (2013). Predictors of Late Presentation for HIV Diagnosis : A Literature Review and Suggested Way Forward, 5–30. <https://doi.org/10.1007/s10461-011-0097-6>
- Mulawa, M., & Barrington, C. (2016). Social Network Influence on HIV Testing Among Urban Men in Tanzania Social Network Influence on HIV Testing Among Urban Men in Tanzania. *AIDS and Behavior*, (August). <https://doi.org/10.1007/s10461-016-1513-8>
- Musheke, M., Ntalasha, H., Gari, S., McKenzie, O., Bond, V., Martin-Hilber, A., & Merten, S. (2013). A systematic review of qualitative findings on factors enabling and deterring uptake of HIV testing in Sub-Saharan Africa. *BMC Public Health*. <https://doi.org/10.1186/1471-2458-13-220>
- Obermeyer, C. M., & Osborn, M. (2007). The utilization of testing and counseling for HIV: A review of the social and behavioral evidence. *American Journal of Public Health*. <https://doi.org/10.2105/AJPH.2006.096263>
- Pampel, F. C., Krueger, P. M., & Denney, J. T. (2010). Socioeconomic disparities in health behaviors. *Annual Review of Sociology*, 36, 349.
- Pathfinder. (2006). Report on Causes and Consequences of Early Marriage in Amhara Region. *Health (San Francisco)*.

Pettifor, A. E., van der Straten, A., Dunbar, M. S., Shiboski, S. C., & Padian, N. S. (2004a). Early age of first sex. *Aids*, *18*(10), 1435–1442. <https://doi.org/10.1097/01.aids.0000131338.61042.b8>

Pettifor, A. E., van der Straten, A., Dunbar, M. S., Shiboski, S. C., & Padian, N. S. (2004b). Early age of first sex. *Aids*. <https://doi.org/10.1097/01.aids.0000131338.61042.b8>

Pratley, P. (2016). Associations between quantitative measures of women's empowerment and access to care and health status for mothers and their children: A systematic review of evidence from the developing world. *Social Science and Medicine*. <https://doi.org/10.1016/j.socscimed.2016.08.001>

Rafferty, Y. (2013). International Dimensions of Discrimination and Violence against Girls: A Human Rights Perspectives. *Journal of Interpersonal Violence*. <https://doi.org/> "

Roura, M., Urassa, M., Busza, J., Mbata, D., Wringe, A., & Zaba, B. (2009). Scaling up stigma? The effects of antiretroviral roll-out on stigma and HIV testing. Early evidence from rural Tanzania. *Sexually Transmitted Infections*. <https://doi.org/10.1136/sti.2008.033183>

Rowlands, J. (1995). Empowerment Examined. *Development in Practice*. <https://doi.org/10.1080/0961452951000157074>

Sano, Y., Sedziafa, A. P., Amoyaw, J. A., Boateng, G. O., Kuuire, V. Z., Boamah, S., & Kwon, E. (2016). Exploring the linkage between exposure to mass media and HIV testing among married women and men in Ghana. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*.

<https://doi.org/10.1080/09540121.2015.1131970>

Siziya, S., Muula, A. S., Rudatsikira, E., & Mataya, R. H. (2008). Correlates of HIV testing among women in Malawi: Results from the 2006 Multiple Indicator Cluster Survey. *Tropical Medicine and International Health*. <https://doi.org/10.1111/j.1365-3156.2008.02155.x>

Tekletsadik, E., Fantahun, M., & Shaweno, D. (2014). Is community conversation associated with human immunodeficiency virus voluntary counseling and testing service uptake in rural communities in Ethiopia? A comparative cross-sectional study. *North American Journal of Medical Sciences*. <https://doi.org/10.4103/1947-2714.127741>

Tenkorang, E. Y., & Owusu, G. A. (2010). Correlates of HIV testing among women in Ghana: Some evidence from the Demographic and Health Surveys. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*. <https://doi.org/10.1080/09540120903193716>

Testing, H. I. V., & Initiation, A. R. T. (2010). Toward Universal Access to HIV Counseling and Testing and Antiretroviral Treatment in Ethiopia: Looking Beyond, 24(8). <https://doi.org/10.1089/apc.2009.0286>

Türmen, T. (2003). Gender and HIV/AIDS. *International Journal of Gynecology and Obstetrics*. [https://doi.org/10.1016/S0020-7292\(03\)00202-9](https://doi.org/10.1016/S0020-7292(03)00202-9)

UN General Assembly. (1989). Convention on the Rights of a Child. *United Nations, Treaty Series*. <https://doi.org/10.2307/4065371>

- United Nations. (2015). *The world's women 2015 : Trends and Statistics*.
- United Nations Department of Economics and Social Affairs. (2010). *The World's Women 2010. Trends and Statistics. United Nations Department of Economics and Social Affairs*. <https://doi.org/ST/ESA/STAT/SER.K/19>
- Vandemoortele, J., & Delamonica, E. (2014). The " education vaccine " against HIV, (April).
- Vidanapathirana, J., Abramson, M. J., Forbes, A., & Fairley, C. (2005). Mass media interventions for promoting HIV testing. *Cochrane Database of Systematic Reviews*. <https://doi.org/10.1002/14651858.cd004775.pub2>
- Wado, Y. D. (2018). Women's autonomy and reproductive health-care-seeking behavior in Ethiopia. *Women and Health*. <https://doi.org/10.1080/03630242.2017.1353573>
- Walsemann, K. M., Goosby, B. J., & Farr, D. (2016). Life course SES and cardiovascular risk: Heterogeneity across race/ethnicity and gender. *Social Science & Medicine*, *152*, 147–155.
- Weiss, E., Whelan, D., & Gupta, G. R. (2000). Gender, sexuality and HIV: Making a difference in the lives of young women in developing countries. *Sexual and Relationship Therapy*. <https://doi.org/10.1080/14681990050109836>
- WHO, UNICEF, U. and T. W. B. (2010). Trends in Maternal Mortality : 1990 to 2010. *Organization*. <https://doi.org/ISBN 978 92 4 150363 1>
- WHO. (2010). Addressing the Challenge of Women ' s Health in Africa. Retrieved from http://www.afro.who.int/index.php?option=com_content&view=article&id=2049&It

emid=841

World Health Organization. (2003). Gender and HIV/AIDS Gender and HEALTH.
International Journal of Gynecology & Obstetrics. [https://doi.org/DOI:
10.1016/S0020-7292\(03\)00202-9](https://doi.org/DOI:10.1016/S0020-7292(03)00202-9)

Table 4.3 Characteristics of study sample (n = 3637) by HIV testing

Characteristic	Number (weighted %)	Ever Tested	Ever tested for HIV	P-value
		NO	Yes	
Household decision making				<0.001
Don't participate	1108 (31.4%)	569 (58.8%)	539 (41.2%)	
Do participate	2529 (68.6%)	1045 (44.4%)	1484 (55.6%)	
Emotional Violence				<0.001
No	2846 (76.9%)	1231 (46.4%)	1615 (53.6%)	
Yes	791 (23.1%)	383 (57.4%)	408 (42.6%)	
Age				0.07
15-24	902 (20%)	379 (45.9%)	523 (54.1%)	
25-39	1624 (45.3%)	708 (47.3%)	916 (52.7%)	
40 -49	1111 (34.4%)	527 (52.9%)	584 (47.1%)	
Wealth				<0.001
Poor	1566 (37.2%)	1024 (65.3%)	542 (34.7%)	
Middle	540 (20.5%)	256 (55.8%)	284 (44.2%)	
Rich	1531 (42.3%)	334 (31.2%)	1197 (68.8%)	
Education				<0.001
No Education	2034 (60.2%)	1216 (60.9%)	818 (39.1%)	
Primary	1062 (28.1%)	338 (39.9%)	724 (60.1%)	
Secondary and Above	541 (11.8%)	60 (9.2%)	481 (90.8%)	
Marital status				N/A
Married/living with Partner	3637 (100%)	N/A	N/A	
Residence				<0.001
Urban	917 (17.1%)	106 (13%)	811 (87%)	
Rural	2720 (82.9%)	1508 (56.4%)	1212 (43.6%)	
Living arrangement				0.037
Living with her	3230 (91.8%)	1437 (49.7%)	1793 (50.3%)	
Staying Elsewhere	407 (8.2%)	177 (40.3%)	230 (59.7%)	
Tested for HIV				N/A

No	1614 (48.9%)	N/A	N/A	
Yes	2023 (51.1%)	N/A	N/A	
Respondent currently working				<0.001
NO	2394 (67%)	1168 (52.9%)	1226 (47.1%)	
Yes	1243 (33%)	446 (40.8%)	797 (59.2%)	
Husband Currently working				0.76
No	827 (23.2%)	413 (49.7%)	414 (50.3%)	
Yes	2810 (76.8%)	1201 (48.7%)	1609 (51.3%)	
Husband Education				<0.001
None	1607 (46%)	948 (58.8%)	659 (41.2%)	
Primary	1189 (36.4%)	493 (47.7%)	696 (52.3%)	
Secondary and Above	841 (17.9%)	173 (26.4%)	668 (73.6%)	
Age at first sex				0.021
1 thr 14	715 (22%)	337 (53.6%)	378 (46.4%)	
15 thru 17	1597 (44%)	781 (50.4%)	816 (49.6%)	
18 and above	1325 (34.4%)	496 (44.1%)	829 (55.9%)	
Know a place to get tested				<0.001
No	800 (25.5%)	800 (100%)		
Yes	2837 (74.5%)	814 (31.4%)	2023 (68.6%)	
Comprehensive HIV knowledge				<0.001
No	3005 (82.4%)	1475 (53.4%)	1530 (46.6%)	
Yes	632 (17.6%)	139 (27.8%)	493 (72.2%)	
Discriminatory attitude towards people living with HIV				<0.001
No	1293 (30.3%)	299 (26.6%)	994 (73.4%)	
Yes	2344 (69.7%)	1315 (58.6%)	1029 (41.4%)	
Media Access				<0.001
Limited or None	2640 (76.2%)	1429 (56.8%)	1211 (43.2%)	
At least once a week or more	997 (23.8%)	185 (23.6%)	812 (76.4%)	

Table 4.4 Logistic Regression Analysis

Characteristics	Adjusted Odds Ratio (95% confidence Interval)	P-value
Household decision making		
Don't participate	0.71 (0.55 - 0.93)	0.012
Do participate	1	
Emotional Violence		
No	1.30 (0.99 - 1.72)	0.058
Yes	1	
Age		
15-24	0.96 (0.68 - 1.34)	0.82
25-39	1.06 (0.82 - 1.37)	0.65
40 -49	1	
Wealth		
Poor	0.53 (0.39 - 0.72)	< 0.01
Middle	0.77 (0.55 - 1.07)	0.12
Rich	1	
Education		
No Education	0.22 (0.11 - 0.42)	< 0.001
Primary	0.40 (0.22 - 0.72)	0.002
Secondary and Above	1	
Marital status		
Married/living with Partner	N/A	N/A
Residence		
Urban	2.70 (1.83 - 3.98)	< 0.001
Rural	1	
Living arrangement		
Living with her	0.85 (0.55 - 1.29)	0.45
Staying Elsewhere	1	
Respondent currently working		
NO	0.94 (0.74 - 1.21)	0.66
Yes	1	
Husband Currently working		
No	1.13 (0.85 - 1.49)	0.39
Yes	1	
Husband Education		

None	1.49 (1.01 - 2.20)	0.04
Primary	1.46 (1.01 - 2.11)	0.04
Secondary and Above	1	
Age at first sex		
1 thr 14	1.15 (0.84 - 1.58)	0.36
15 thru 17	1.12 (0.87 - 1.43)	0.36
18 and above	1	
Comprehensive HIV knowledge		
No	0.67 (0.49 - 0.92)	0.014
Yes	1	
Discriminatory attitude towards people living with HIV		
No	1.91 (1.43 - 2.56)	< 0.001
Yes	1	
Media Access		
Limited or None	0.72 (0.50 - 1.04)	0.08
At least once a week or more	1	

Chapter 5

Conclusions and Implications

The goal of this dissertation research was to understand the link between women's empowerment and HIV testing in Ethiopia. For the purpose of the dissertation, I defined empowerment as having the following five attributes: 1) Having higher socioeconomic standing; 2) having more participation in household decision making; 3) Having more participation in one's own personal health; 4) Having higher level of media exposure, and 5) Having limited to no personal exposure to violence. To meet this goal, I used data from the 2016 Ethiopian Demographic and Health Survey to analyze the connection between women's empowerment and having ever been tested for HIV. In particular, the dissertation identified 5 specific aims. In this chapter, I will discuss the findings relevant to each aim and identify directions for future research and practice.

Aim 1: Examine the association between socio-demographic variables (e.g. age, education, occupation, household income, urban or rural residence) and uptake of HIV testing among Ethiopian women.

I hypothesized that women with higher socioeconomic standing will be more likely to have been tested for HIV than those with lower socio-economic standing. In the analysis of both studies, socioeconomic status was associated with HIV testing uptake among women. While HIV testing was associated with education, wealth, residence, and

respondent's employment status in the first analysis, all except employment status were associated with testing in the second.

Link and Phelan posited socioeconomic (SES) as a fundamental cause of health and illness as it determines resource access (Link & Phelan, 2006). Resources include education, employment, wealth and other important social conditions that help the individual minimize risk exposure and buffer adverse life conditions. A good example in this regard could be how the low socio-economic status of women in sub-Saharan affect many aspects of their life conditions. A recent study demonstrated how young girls in rural Africa are more likely to be abducted, marry early, drop out of school, and be genital mutilated due to dominant cultural norms and how those are related with high HIV infection rates, obstetric fistula, and maternal mortality due to birth complications (Rafferty, 2013).

Similar studies in sub-sahran Africa have also demonstrated the inverse relationship between SES and HIV testing uptake. This may not be surprising given that some aspects of higher SES, particularly education, increases women's capacity to question, reflect and act on the conditions of their lives (Kabeer, 2005). Additionally, women with high SES are also more likely to know about HIV prevention. Similarly, the disparity in HIV testing between urban and rural women can be attributed to the rural-urban gap in health care delivery in low income setting such as Ethiopia where providing comprehensive health care to women and girls in both isolated rural centers and growing urban centers is an outstanding challenge (WHO, 2010).

Aim 2: Assess the association between women's household decision making autonomy and uptake of HIV testing among Ethiopian women.

I hypothesized that women with higher levels of participation in household decisions will be more likely to have been tested for HIV than those with lower levels of engagement in household decision-making. Household decision making was measured by combining three different variables namely: women's participation in their own health care, large household purchases, and decision-making regarding visits to family or relatives. Household decision making was positively associated with HIV testing uptake.

Household decision making is commonly used to measure women's agency or empowerment in the extant literature (Malhotra et al., 2002). Women's involvement in decision making has consistently shown a positive association with maternal and child health outcomes (Pratley, 2016). For instance, studies show how empowered women were less likely to encounter intimate partner violence (Kim et al., 2007) and have disapproving attitude towards wife beating (Ebrahim & Atteraya, 2018). In the current study, more than half (68.6%) of women participated in household decision making and those who did were more likely to have been tested for HIV.

Measuring women's decision-making autonomy is important given that women are considered respectable if they subscribe to gender specific roles such as marriage, motherhood, and submit to husband's authority in part of Africa (Khumalo, McKay, & Freimund, 2015). The respectability discourse can constrain women's labor, bodies, and property rights by differentiating "respectable" women from the "unrespectable," where women who outwardly live in accordance with the norms of respectability are considered as deserving of social esteem and resources, and the mistreatment of "unrespectable" women is rationalized by their breach of the same norms (Khumalo et al., 2015).

Aim 3: Assess the association between personal health care decision making autonomy and uptake of HIV testing.

The majority (81.5%) of women reported active participation in their personal health care decisions. As hypothesized at the beginning of the study, compared to those who participated in health care decision making, women who did not report making their own health care decisions were less likely to have been tested for HIV. Because of the absence of a health-specific dimension of empowerment in the current literature, many researchers have mentioned the importance of health-related decision making as a conceptually separate dimension (Pratley, 2016).

The inclusion of a measure of personal decision making autonomy in this research is important given that women's empowerment requires increasing their ability to exercise choice over their own lives, particularly over strategic life choices such as marriage, fertility (Kabeer, 1999a) and HIV testing. There is evidence that gender power dynamics play a role in the HIV testing uptake of women (Musheke et al., 2013). Within marital relationships, gender inequality affects women's uptake of HIV testing. Whereas men exercise their personal decision making autonomy to get tested, women must seek permission from their husband/partner to do the same (Maman et al., 2001). Prior research indicates that women's choice can be enhanced in multiple domains, including increased decision-making capacity, access to income, productive assets, self-confidence and solidarity with other women (Khumalo et al., 2015).

Aim 4: Assess the association between media exposure and HIV testing among women.

Use of mass media is one of the most important strategies in communicating behavioral change in relation to HIV/AIDS. Mass media has been successfully used to promote voluntary HIV counselling and testing and to sustain test seeking behavior (Vidanapathirana, Abramson, Forbes, & Fairley, 2005). Exposure to mass media, such as radio, TV, and print media is considered as a useful tool for reducing risky sexual behaviors (Sano et al., 2016). Mass communication can also increase knowledge about HIV and facilities related to HIV testing, in addition to creating demand for the latter (Vidanapathirana et al., 2005)

In this study, seventy-six (76%) of the women had limited or no exposure to media outlets. As hypothesized, women who had little to no exposure to media were less likely to have ever been tested for HIV than those who had access at least once a week. The results of this study are consistent with findings from other studies in sub-Saharan Africa. In Ghana, higher exposure to mass media was positively associated with the uptake of HIV testing among men and women after controlling for demographic and psychological variables (Sano et al., 2016). Results from a population-based study in Uganda also revealed how the frequency of exposure to mass media increases both adolescent's likelihood to get tested for HIV and their HIV related knowledge score (Bago & Lompo, 2019).

AIM 5: Assess the association between violence and HIV testing.

This research may be the first study to assess the association between the IPV and HIV testing in Africa, although earlier studies have established the link between violence and HIV. Intimate partner violence is the most common form of violence throughout the world with physical violence being the highest in Africa (United Nations, 2015). Earlier studies have shown how a woman's risk for HIV infection increases by limiting her ability to negotiate HIV prevention behaviors (WHO, 2010). There is also evidence on how the threat of violence constrains women's ability to negotiate the conditions of sexual intercourse, particularly condom use (World Health Organization, 2003)

In the current study, nearly 23% of the women reported having experienced emotional spousal violence. Exposure to emotional spousal violence was measured by asking women if their husband/partner did any of the following to them: said or did something to humiliate them in front of others, threaten to hurt or harm them or someone close to them, or insult them or make them feel bad about themselves. Contrary to our hypothesis, there was no association between emotional spousal violence and HIV testing.

Limitations

This study was subject to several limitations and results should be interpreted with caution. First, the data for this analysis were collected through a cross sectional survey and therefore inference of causality is not possible. Second, there is a potential for recall bias since some of the questions asked require participants to remember information from the past. Third, since the questionnaires were administered through face to face interview, there is a potential for social desirability bias. Women participants could say something to appeal

to their interviewers or could potentially withhold information in order to avoid judgment. Four, since a subset of the women population (married women or those living with a partner) were included in the analysis, it is not possible to generalize to all Ethiopian women.

Implications for future research

The premise and findings from this research provide several directions for future research. First, given that women's empowerment is a process, future longitudinal studies should be designed to assess the empowerment level of women at different points in time and to examine how those indicators may be related to HIV testing. To that end, researchers could use a randomized controlled design to assess the effect of an empowerment intervention between an experimental and a control group. Second, future research on HIV testing in African countries should include unmarried women or those living without a partner in the sample. Third, given the limited number of empowerment indicators included in this research, future studies should expand the scope of the study and examine the relationships between other aspects of empowerment and how those are tied to HIV testing. For instance, researchers could assess the link between reproductive rights of women (in relation to their decision-making autonomy on the number of children they want to have, contraceptive use, and condom use) and HIV testing. Fourth, using a mixed methods design would further validate findings from this study and help elucidate the nuances of power in gendered relationships. Fifth, this study only assessed the relationship between one aspect of violence and HIV testing. Future research can assess the link between other forms of gender-based violence and HIV testing among women. These may include physical violence, sexual violence, female genital mutilation, and child marriage.

Implications for practice

The results of this dissertation reiterate the importance of better understanding the link between women's empowerment and HIV testing. Such an understanding can help practitioners and policy makers to design programs that enhance HIV testing uptake among women. Policy makers should note that the health and wellbeing of women is tied to their socio-economic status. That is, if enough resources are directed to increasing women's educational attainment, particularly on their completion of secondary level education or above, improvements in women's health and wellbeing will follow naturally. This is related to the fact that when girls spend most of their youth in school, they tend to marry later in life, have better access to information and health enhancing resources, and acquire the marketable skills that will foster economic independence. To that end, the government should design programs such as conditional cash transfer and quota systems in order to increase enrollment and retention of girls in secondary schools and above. Additionally, the government should design microfinance projects to enhance the individual and collective power of women through training and access to loan. In that regard, Ethiopia could emulate south Africa's successful Microfinance for AIDS and Gender Equity (IMAGE) project (Kim et al., 2007)

Second, public health professionals should work to increase the decision-making power of women in all aspects of their life. In many parts of Ethiopia, the community conversation model was instrumental in developing the capacity of communities and the organizations working with them to effectively respond to the HIV epidemic. Community conversation allows an open discussion about taboo issues, such as gender, harmful traditional practices, and sexual relations (Tekletsadik, Fantahun, & Shaweno, 2014).

These approaches have been employed in empowering rural women in Ethiopia (Alemu, Conserve & Tolossa, 2017), and the same can be used to enhance HIV testing among women in the general population.

Third, policy makers should aim at increasing media access of women. There is clear evidence of the importance of the media in creating awareness, sensitization and encouraging people to act towards HIV testing and of the role of television, radio, and print media in increasing HIV awareness and limiting risky sexual behaviors (Vidanapathirana et al., 2005). Given that most women live in rural areas and are illiterate in Ethiopia, expanding electronic media such as radio would be instrumental in disseminating information on HIV testing. In places where media access is limited, the government can expand information access by creating information hubs in villages. For instance, a local NGO in Ethiopia has been successful in empowering women by creating a walk-in site that provides free access to TV, VCR, documentaries and other resources to villagers in D/Zeit. The same NGO has also been effective in expanding information access to villagers through school-based medias (Alemu, Conserve & Tolossa, 2017).

Conclusions

Prior research has examined the relationships between women's empowerment and various maternal and child health outcomes. However, a gap in the current research literature is the examination of HIV testing and women's empowerment. To begin to address this knowledge gap, this dissertation examined relationships among several domains of empowerment associated with HIV testing in Ethiopia and employed a national sample. The results of the study demonstrated the importance of socio-economic status, media exposure, household decision making autonomy, and health care decision making

autonomy in determining HIV testing among women. These findings are relevant to practitioners, program directors, and policy makers involved in efforts to promote HIV testing among women.

References

- Aday, L. A., & Andersen, R. (1974). A framework for the study of access to medical care. *Health Services Research*.
- Alemu, Y. M., Ambaw, F., & Wilder-Smith, A. (2017). Utilization of HIV testing services among pregnant mothers in low income primary care settings in northern Ethiopia: A cross sectional study. *BMC Pregnancy and Childbirth*.
<https://doi.org/10.1186/s12884-017-1389-2>
- Andersson, N., Cockcroft, A., & Shea, B. (2008). Gender-based violence and HIV: Relevance for HIV prevention in hyperendemic countries of southern Africa. *AIDS*.
<https://doi.org/10.1097/01.aids.0000341778.73038.86>
- Avert. (2017). Global HIV and AIDS statistics | AVERT. *Avert*.
<https://doi.org/10.1596/1813-9450-6869>
- Aynew, A., Leykun, A., Colebunders, R., & Deribew, A. (2010). Predictors of HIV testing among patients with tuberculosis in North West Ethiopia: A case-control study. *PLoS ONE*. <https://doi.org/10.1371/journal.pone.0009702>
- Bago, J. L., & Lompo, M. L. (2019). Exploring the linkage between exposure to mass media and HIV awareness among adolescents in Uganda. *Sexual and Reproductive Healthcare*. <https://doi.org/10.1016/j.srhc.2019.04.00>

- Balcha, T. T., Lecerof, S. S., & Jeppsson, A. R. (2011). Strategic challenges of PMTCT program implementation in Ethiopia. *Journal of the International Association of Physicians in AIDS Care*. <https://doi.org/10.1177/154510971036993>
- Bashemera, D. R., Nhembo, M. J., & Benedict, G. (2013). The role of women's empowerment in influencing HIV testing. *DHS Working Papers No. 101*.
- Batliwala, S. (2007). Taking the power out of empowerment - An experiential account. *Development in Practice*. <https://doi.org/10.1080/09614520701469559>
- Berry, M. E. (2015). When "Bright Futures" Fade: Paradoxes of Women's Empowerment in Rwanda. *Signs: Journal of Women in Culture and Society*. <https://doi.org/10.1086/681899>
- Bradley, H., Tsui, A., Kidanu, A., & Gillespie, D. (2011). Client characteristics and HIV risk associated with repeat HIV testing among women in Ethiopia. *AIDS and Behavior*. <https://doi.org/10.1007/s10461-010-9765-1>
- Burnet, J. E. (2007). *Jefremovas Villia. Brickyards to Graveyards: From Production to Genocide in Rwanda*. Albany, N.Y.: State University of New York Press, 2002. xi + 162 pp. Illustrations. Maps. Photographs. Appendixes. Notes. Bibliography. Index. \$21.95. Paper. *African Studies Review*. <https://doi.org/10.1353/arw.2005.0096>
- Buvé, A., Bishikwabo-Nsarhaza, K., & Mutangadura, G. (2002). The spread and effect of HIV-1 infection in sub-Saharan Africa. *Lancet*. [https://doi.org/10.1016/S0140-6736\(02\)08823-2](https://doi.org/10.1016/S0140-6736(02)08823-2)

Castle, S. (2003). Doubting the existence of AIDS: A barrier to voluntary HIV testing and counselling in urban Mali. *Health Policy and Planning*.
<https://doi.org/10.1093/heapol/czg019>

CDC. (2018). About HIV/AIDS | HIV Basics | HIV/AIDS | CDC.

CEDAW; UN General Assembly. Convention on the Elimination of All Forms of Discrimination against Women., Annual review of population law § (1979).
<https://doi.org/10.1093/oxfordhb/9780199560103.003.0005>

Central Statistical Agency [Ethiopia] and ICF International. (2016). *Ethiopian Demographic and Health Survey 2016 Key Indicators Report. Ethiopians Water Sector Development Program*.

Chirawu, P., Langhaug, L., Mavhu, W., Pascoe, S., Dirawo, J., & Cowan, F. (2010). Acceptability and challenges of implementing voluntary counselling and testing (VCT) in rural Zimbabwe: Evidence from the Regai Dzive Shiri Project. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*.
<https://doi.org/10.1080/09540120903012577>

Cohen, M. S., Chen, Y. Q., McCauley, M., Gamble, T., Hosseinipour, M. C., Kumarasamy, N., ... Fleming, T. R. (2015). Final results of the HPTN 052 randomized controlled trial: antiretroviral therapy prevents HIV transmission. *Journal of International Aids Society*. <https://doi.org/10.7448/IAS.18.5.20482>

Dellar, R. C., Dlamini, S., & Karim, Q. A. (2015). Adolescent girls and young women: Key populations for HIV epidemic control. *Journal of the International AIDS Society*.
<https://doi.org/10.7448/IAS.18.2.19408>

- Demissie, A., Deribew, A., & Abera, M. (2006). Determinants of acceptance of voluntary HIV testing among antenatal clinic attendees at Dil Chora Hospital , Dire Dawa ,.
- Department of Economic and Social Affairs. (2010). *The World's Women 2010 - Trends and Statistics*. United Nations Department of Economic and Social Affairs. <https://doi.org/ST/ESA/STAT/SER.K/19>
- Deressa, W., Seme, A., Asefa, A., Teshome, G., & Enquesellassie, F. (2014). Utilization of PMTCT services and associated factors among pregnant women attending antenatal clinics in Addis Ababa, Ethiopia. *BMC Pregnancy and Childbirth*. <https://doi.org/10.1186/1471-2393-14-328>
- Dunkle, K. L., Jewkes, R. K., Brown, H. C., Gray, G. E., McIntyre, J. A., & Harlow, S. D. (2004a). Gender-based violence, relationship power, and risk of HIV infection in women attending antenatal clinics in South Africa. *Lancet*. [https://doi.org/10.1016/S0140-6736\(04\)16098-4](https://doi.org/10.1016/S0140-6736(04)16098-4)
- Dunkle, K. L., Jewkes, R. K., Brown, H. C., Gray, G. E., McIntyre, J. A., & Harlow, S. D. (2004b). Transactional sex among women in Soweto, South Africa: prevalence, risk factors and association with HIV infection. *Social Science & Medicine*, 59(8), 1581–1592.
- Ebrahim, N. B., & Atteraya, M. S. (2018). Women's Decision-Making Autonomy and their Attitude towards Wife-Beating: Findings from the 2011 Ethiopia's Demographic and Health Survey. *Journal of Immigrant and Minority Health*. <https://doi.org/10.1007/s10903-017-0592-6>
- EDHS 2016 Team. (2016). Ethiopian Demographic and Health Survey. *Report*.

- Erulkar, A., & Ab Mekbib, T. (2007). Invisible and vulnerable: Adolescent domestic workers in Addis Ababa, Ethiopia. *Vulnerable Children and Youth Studies*. <https://doi.org/10.1080/17450120701487857>
- Facha, W., Kassahun, W., & Workicho, A. (2016). Predictors of provider- initiated HIV testing and counseling refusal by outpatient department clients in Wolaita zone, Southern Ethiopia: A case control study. *BMC Public Health*. <https://doi.org/10.1109/WIRLES.2005.1549530>
- FAWE. (2017). Girls' Education in Sub-Saharan Africa.
- Fetene, N. W., & Feleke, A. D. (2010). Missed opportunities for earlier HIV testing and diagnosis at the health facilities of Dessie town, North East Ethiopia. *BMC Public Health*. <https://doi.org/10.1186/1471-2458-10-362>
- Frank, E. (2009). The relation of HIV testing and treatment to identity formation in Zambia. *African Journal of AIDS Research*. <https://doi.org/10.2989/AJAR.2009.8.4.15.1052>
- Fuentes, C. M. M. (2008). Pathways from Interpersonal Violence to Sexually Transmitted Infections: A Mixed-Method Study of Diverse Women. *Journal of Women's Health*. <https://doi.org/10.1089/jwh.2008.0885>
- Gelberg, L., Andersen, R. M., & Leake, B. D. (2000). The Behavioral Model for Vulnerable Populations: application to medical care use and outcomes for homeless people. *Health Services Research*.
- Grant, E., Logie, D., Masura, M., Gorman, D., & Murray, S. A. (2008). Factors facilitating and challenging access and adherence to antiretroviral therapy in a township in the

- Zambian Copperbelt: A qualitative study. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*. <https://doi.org/10.1080/09540120701854634>
- Gregson, S., Waddell, H., & Chandiwana, S. (2001). School education and HIV control in sub-Saharan Africa: From discord to harmony? *Journal of International Development*, *13*(4), 467–485. <https://doi.org/10.1002/jid.798>
- Gupta, G. R. (2000). Gender, sexuality, and HIV/AIDS: the what, the why, and the how. *Canadian HIV/AIDS Policy & Law Review*. <https://doi.org/10.1016/j.jcct.2007.12.012>
- Heise, L. L., & Elias, C. (1995). Transforming AIDS prevention to meet women's needs: A focus on developing countries. *Social Science and Medicine*. [https://doi.org/10.1016/0277-9536\(94\)00165-P](https://doi.org/10.1016/0277-9536(94)00165-P)
- International, C. S. A. [Ethiopia] and I. (2012). Ethiopia Demographic and Health Survey 2011. *Health San Francisco*. <https://doi.org/978-92-1-101320-7>
- Izugbara, C. O., Undie, C. C., Mudege, N. N., & Ezeh, A. C. (2009). Male youth and voluntary counseling and HIV-testing: The case of Malawi and Uganda. *Sex Education*. <https://doi.org/10.1080/14681810903059078>
- Jerene, D., Endale, A., & Lindtjørn, B. (2007). Acceptability of HIV counselling and testing among tuberculosis patients in south Ethiopia. *BMC International Health and Human Rights*. <https://doi.org/10.1186/1472-698X-7-4>
- Joint United Nations Program on HIV/AIDS. (2014). Treatment 2020 90-90-90 to help end the AIDS epidemic. *United Nations*.

- Kabeer, N. (1999a). Resources, agency, achievements: Reflections on the measurement of women's empowerment. *Development and Change*. <https://doi.org/10.1111/1467-7660.00125>
- Kabeer, N. (1999b). Resources , Agency , Achievements : Reflections on the Measurement of Women ' s Empowerment, *30*(May), 435–464.
- Kabeer, N. (2005). Gender equality and women's empowerment: A critical analysis of the third Millennium Development Goal. *Gender and Development*. <https://doi.org/10.1080/13552070512331332273>
- Kaiser Family Foundation. (2016). The Global HIV / AIDS Epidemic: Fact Sheet. *The Henry Kaiser Family Foundation*.
- Kharsany, A. B. M., & Karim, Q. A. (2016). HIV Infection and AIDS in Sub-Saharan Africa: Current Status, Challenges and Opportunities. *The Open AIDS Journal*. <https://doi.org/10.2174/1874613601610010034>
- Khumalo, K. E., McKay, K. H., & Freimund, W. (2015). Who is a “real woman”? Empowerment and the discourse of respectability in Namibia's Zambezi region. *Women's Studies International Forum*. <https://doi.org/10.1016/j.wsif.2014.10.002>
- Kim, J. C., Watts, C. H., Hargreaves, J. R., Ndhlovu, L. X., Phetla, G., Morison, L. A., ... Pronyk, P. (2007). Understanding the impact of a microfinance-based intervention on women's empowerment and the reduction of intimate partner violence in South Africa. *American Journal of Public Health*. <https://doi.org/10.2105/AJPH.2006.095521>

- Kosack, C. S., Page, A. L., Beelaert, G., Benson, T., Savane, A., Ng'Ang'A, A., ... Fransen, K. (2017). Towards more accurate HIV testing in sub-Saharan Africa: A multi-site evaluation of HIV RDTs and risk factors for false positives. *Journal of the International AIDS Society*. <https://doi.org/10.7448/IAS.20.1.21345>
- Larsson, E. C., Thorson, A., Nsabagasani, X., Namusoko, S., Popenoe, R., & Ekström, A. M. (2010). Mistrust in marriage-Reasons why men do not accept couple HIV testing during antenatal care - A qualitative study in eastern Uganda. *BMC Public Health*. <https://doi.org/10.1186/1471-2458-10-769>
- Link, B. G., & Phelan, J. (2006). Social Conditions As Fundamental Causes of Disease. *Journal of Health and Social Behavior*. <https://doi.org/10.2307/2626958>
- Luginaah, I. N., Yiridoe, E. K., & Taabazuing, M. M. (2005). From mandatory to voluntary testing: Balancing human rights, religious and cultural values, and HIV/AIDS prevention in Ghana. *Social Science and Medicine*. <https://doi.org/10.1016/j.socscimed.2005.03.034>
- Luseno, W. K., & Wechsberg, W. M. (2009). Correlates of HIV testing among South African women with high sexual and substance-use risk behaviours. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*. <https://doi.org/10.1080/09540120802017594>
- Mabunda, G. (2006). Voluntary HIV Counseling and Testing: Knowledge and Practices in a Rural South African Village. *Journal of Transcultural Nursing*. <https://doi.org/10.1177/1043659605281978>

- MacQuarrie, K. L. D., Winter, R., & Kishor, S. (2013). Spousal Violence and HIV: Exploring the Linkages in Five Sub-Saharan African Countries. *DHS Analytical Study No 36*.
- Malhotra, A., Schuler, S. R., & Boender, C. (2002). Women's empowerment as a variable in international development. *Measuring Empowerment: Cross-Disciplinary Perspectives*. <https://doi.org/10.1596/0-8213-6057-4>
- Maman, S., Campbell, J., Sweat, M. D., & Gielen, A. C. (2000). The intersections of HIV and violence: directions for future research and interventions 10.1016/S0277-9536(99)00270-1 : Social Science & Medicine | ScienceDirect.com, 50.
- Maman, S., Mbwambo, J., Hogan, N. M., Kilonzo, G. P., & Sweat, M. (2001). Women's barriers to HIV-1 testing and disclosure: Challenges for HIV-1 voluntary counselling and testing. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*. <https://doi.org/10.1080/09540120120063223>
- Maman, S., Mbwambo, J. K., Hogan, N. M., Kilonzo, G. P., Campbell, J. C., Weiss, E., & Sweat, M. D. (2002). HIV-positive women report more lifetime partner-violence: Findings from a voluntary counseling and testing clinic in Dar es Salaam, Tanzania. *American Journal of Public Health*. <https://doi.org/10.2105/AJPH.92.8.1331>
- Mane, P., & Aggleton, P. (2001). Gender and HIV/AIDS: What Do Men have to Do with it? *Current Sociology*. <https://doi.org/10.1177/0011392101496005>
- Mavedzenge, S. N., Baggaley, R., & Corbett, E. L. (2013). A review of self-testing for HIV: Research and policy priorities in a new era of HIV prevention. *Clinical Infectious Diseases*. <https://doi.org/10.1093/cid/cit156>

- Meiberg, A. E., Bos, A. E. R., Onya, H. E., & Schaalma, H. P. (2008). Fear of stigmatization as barrier to voluntary HIV counselling and testing in South Africa. *East African Journal of Public Health*.
- Mosedale, S. (2005). Assessing women's empowerment: Towards a conceptual framework. *Journal of International Development*. <https://doi.org/10.1002/jid.1212>
- Mukolo, A., & Villegas, R. (2013). Predictors of Late Presentation for HIV Diagnosis : A Literature Review and Suggested Way Forward, 5–30. <https://doi.org/10.1007/s10461-011-0097-6>
- Mulawa, M., & Barrington, C. (2016). Social Network Influence on HIV Testing Among Urban Men in Tanzania Social Network Influence on HIV Testing Among Urban Men in Tanzania. *AIDS and Behavior*, (August). <https://doi.org/10.1007/s10461-016-1513-8>
- Musheke, M., Ntalasha, H., Gari, S., McKenzie, O., Bond, V., Martin-Hilber, A., & Merten, S. (2013). A systematic review of qualitative findings on factors enabling and deterring uptake of HIV testing in Sub-Saharan Africa. *BMC Public Health*. <https://doi.org/10.1186/1471-2458-13-220>
- Obermeyer, C. M., & Osborn, M. (2007). The utilization of testing and counseling for HIV: A review of the social and behavioral evidence. *American Journal of Public Health*. <https://doi.org/10.2105/AJPH.2006.096263>
- Pampel, F. C., Krueger, P. M., & Denney, J. T. (2010). Socioeconomic disparities in health behaviors. *Annual Review of Sociology*, 36, 349.

- Pathfinder. (2006). Report on Causes and Consequences of Early Marriage in Amhara Region. *Health (San Francisco)*.
- Pettifor, A. E., van der Straten, A., Dunbar, M. S., Shiboski, S. C., & Padian, N. S. (2004a). Early age of first sex. *Aids*, *18*(10), 1435–1442. <https://doi.org/10.1097/01.aids.0000131338.61042.b8>
- Pettifor, A. E., van der Straten, A., Dunbar, M. S., Shiboski, S. C., & Padian, N. S. (2004b). Early age of first sex. *Aids*. <https://doi.org/10.1097/01.aids.0000131338.61042.b8>
- Pratley, P. (2016). Associations between quantitative measures of women’s empowerment and access to care and health status for mothers and their children: A systematic review of evidence from the developing world. *Social Science and Medicine*. <https://doi.org/10.1016/j.socscimed.2016.08.001>
- Rafferty, Y. (2013). International Dimensions of Discrimination and Violence against Girls: A Human Rights Perspectives. *Journal of Interpersonal Violence*. <https://doi.org/> "
- Roura, M., Urassa, M., Busza, J., Mbata, D., Wringe, A., & Zaba, B. (2009). Scaling up stigma? The effects of antiretroviral roll-out on stigma and HIV testing. Early evidence from rural Tanzania. *Sexually Transmitted Infections*. <https://doi.org/10.1136/sti.2008.033183>
- Rowlands, J. (1995). Empowerment Examined. *Development in Practice*. <https://doi.org/10.1080/0961452951000157074>

- Sano, Y., Sedziafa, A. P., Amoyaw, J. A., Boateng, G. O., Kuuire, V. Z., Boamah, S., & Kwon, E. (2016). Exploring the linkage between exposure to mass media and HIV testing among married women and men in Ghana. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*.
<https://doi.org/10.1080/09540121.2015.1131970>
- Siziya, S., Muula, A. S., Rudatsikira, E., & Mataya, R. H. (2008). Correlates of HIV testing among women in Malawi: Results from the 2006 Multiple Indicator Cluster Survey. *Tropical Medicine and International Health*. <https://doi.org/10.1111/j.1365-3156.2008.02155.x>
- Tekletsadik, E., Fantahun, M., & Shaweno, D. (2014). Is community conversation associated with human immunodeficiency virus voluntary counseling and testing service uptake in rural communities in Ethiopia? A comparative cross-sectional study. *North American Journal of Medical Sciences*. <https://doi.org/10.4103/1947-2714.127741>
- Tenkorang, E. Y., & Owusu, G. A. (2010). Correlates of HIV testing among women in Ghana: Some evidence from the Demographic and Health Surveys. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*.
<https://doi.org/10.1080/09540120903193716>
- Testing, H. I. V., & Initiation, A. R. T. (2010). Toward Universal Access to HIV Counseling and Testing and Antiretroviral Treatment in Ethiopia: Looking Beyond, 24(8).
<https://doi.org/10.1089/apc.2009.0286>

- Türmen, T. (2003). Gender and HIV/AIDS. *International Journal of Gynecology and Obstetrics*. [https://doi.org/10.1016/S0020-7292\(03\)00202-9](https://doi.org/10.1016/S0020-7292(03)00202-9)
- UN General Assembly. (1989). Convention on the Rights of a Child. *United Nations, Treaty Series*. <https://doi.org/10.2307/4065371>
- United Nations. (2015). The world's women 2015 : Trends and Statistics.
- United Nations Department of Economics and Social Affairs. (2010). *The World's Women 2010. Trends and Statistics*. United Nations Department of Economics and Social Affairs. <https://doi.org/ST/ESA/STAT/SER.K/19>
- Vandemoortele, J., & Delamonica, E. (2014). The " education vaccine " against HIV, (April).
- Vidanapathirana, J., Abramson, M. J., Forbes, A., & Fairley, C. (2005). Mass media interventions for promoting HIV testing. *Cochrane Database of Systematic Reviews*. <https://doi.org/10.1002/14651858.cd004775.pub2>
- Wado, Y. D. (2018). Women's autonomy and reproductive health-care-seeking behavior in Ethiopia. *Women and Health*. <https://doi.org/10.1080/03630242.2017.1353573>
- Walsemann, K. M., Goosby, B. J., & Farr, D. (2016). Life course SES and cardiovascular risk: Heterogeneity across race/ethnicity and gender. *Social Science & Medicine*, 152, 147–155.
- Weiss, E., Whelan, D., & Gupta, G. R. (2000). Gender, sexuality and HIV: Making a difference in the lives of young women in developing countries. *Sexual and Relationship Therapy*. <https://doi.org/10.1080/14681990050109836>

WHO, UNICEF, U. and T. W. B. (2010). Trends in Maternal Mortality : 1990 to 2010. *Organization*. [https://doi.org/ISBN 978 92 4 150363 1](https://doi.org/ISBN%20978%2092%204%20150363%201)

WHO. (2010). Addressing the Challenge of Women ' s Health in Africa. Retrieved from http://www.afro.who.int/index.php?option=com_content&view=article&id=2049&Itemid=841

World Health Organization. (2003). Gender and HIV/AIDS Gender and HEALTH. *International Journal of Gynecology & Obstetrics*. [https://doi.org/DOI: 10.1016/S0020-7292\(03\)00202-9](https://doi.org/DOI:10.1016/S0020-7292(03)00202-9)