REGIONAL INSTITUTE FOR POPULATION STUDIES (RIPS)

UNIVERSITY OF GHANA

MULTIPLE SEXUAL PARTNERSHIPS AND SEXUALLY TRANSMITTED INFECTIONS

BY

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DECLARATION

I hereby declare that except for reference to other people's work which has been duly acknowledged, this thesis is the result of my own research work carried out in the Regional Institute for Population Studies, University of Ghana, under the supervision of Dr. Naa Dodua Dodoo.

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(Student)	(Supervisor)
Date ……	Date ……

DEDICATION

This work is dedicated to my mother, Mary Edith Adjei: I Miss You!

ACKNOWLEDGMENT

Anyone who has ever pursued postgraduate studies would know that it is not a one-man endeavour. It therefore becomes necessary to acknowledge all those who made the journey possible.

I would first like to acknowledge God for His mercies and blessings that have brought me this far. It is by His grace that I live and have pursued this programme.

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ABSTRACT

Multiple sexual partners (MSPs) are one of the major risk factors in the acquisition and spread of sexually transmitted infections (STIs). The socio-cultural dynamics and high level of mobility especially in low- and middle-income countries (LMICs) such as Ghana for socio-economic advancement increase the exposure and the risk of MSPs and STIs. This study assesses the relationship between multiple sexual partnerships and the incidence of STIs among adult Ghanaians, using data from the 2014 Ghana Demographic and Health Survey (GDHS). A sample of 6696 females in their reproductive ages (15-49 years) and 2710 males of the same age range, was used in the in this study. Analysis was carried out at three stages. Univariate analysis was used to provide a descriptive analysis of the socio-demographic and selected characteristics of the sample population. The bivariate analysis examined the association between the selected independent variables and the dependent variables, as well as the mediating factors. Multivariate analysis was carried out using binary logistic regression as the outcome variable (Sexually Transmitted Infections – STIs) is dichotomous. This analysis enabled the study to assess how the independent factor (multiple sexual partnerships) and all other factors such as consistent condom usage, sex among others, predict the dependent variable (STIs). The results reveal that 7% of respondents had had more than one sexual partner and one in five sexually active individuals have had an STI during the last 12 months preceding the survey. There was a statistically significant association between sex, respondents' age, type of place of residence, among others, and sexually transmitted infections, except religion, at the bivariate level. At the multivariate stage where binary logistic regression models were fitted at two levels, the results indicate that having multiple sexual partnerships (MSPs) significantly associates with STIs, which suggests that, having multiple sexual partners strongly predicts acquisition of sexually transmitted infections. The study recommends that enhanced education on risks involved in

MSPs be undertaken in ensuring people protect themselves from contracting STIs, by having safe sex.

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ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
DHS	Demographic and Health Survey
DALY	Disability Adjusted Life Years
HIV	Human Immunodeficiency Virus
GDHS	Ghana Demographic and Health Survey
GHS	Ghana Health Service.
GSS	Ghana Statistical Service
MSP	Multiple Sexual Partners
STI	Sexually Transmitted Infection
WHO	World Health Organization

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Sexually transmitted infections (STIs) are infections passed from an infected person to another, mostly through sexual contact (anal, oral or vaginal) (CDC, 2014). There are more than 30 bacterial and viral types of STIs including Chlamydia, Gonorrhea, Syphilis, Herpes Simplex 2 virus, Human Papilloma Virus, HIV/AIDS, and Hepatitis B. Sexually transmitted infections are a major reproductive and public health concern in their own right, yet often not given the right attention (Nankinga et al., 2015).

Sexually transmitted infections are among the common diseases in the world with yearly incidence only exceeded by malaria and diarrhea (CDC & World Bank, 2008). In 2013, the World Health Organization estimated about 499 million new cases of curable sexually transmitted infections across the world, and averagely, a little over a million new cases of curable sexually transmitted infections occur across the world every day among people in their reproductive ages. About 536 million people were living with herpes simplex 2 virus and about 291 million women had HPV at a point in time (WHO, 2013).

There are variations in the spread of the sexually transmitted infections with high incidence in some countries and low incidence in other countries. In 2013, an estimate of about 20 million new sexually transmitted infections reported in the USA (CDC, 2013), 435,000 new STIs in the United Kingdom(UK) in 2015 (PHE, 2016) and developing countries are the most affected due to high prevalence (CDC & World Bank, 2008). STIs have been identified as a major hindrance to economic development worldwide (Nasir, Imran, Chohan, & Zaidi, 2015), with Africa having over the years felt the greatest impact of STIs.

About a decade ago, the United Nations estimated that 39.5 million people worldwide were living with HIV and AIDS. Of this number, 63% were in the Sub-Saharan Africa region. The available data also suggests that people under the age of 25 years accounted for half of all new HIV infections worldwide, and approximately 6,000 people were infected with HIV each day (The Soul City Institute, 2008). The UNAIDS also found that of the 33.3 million people living with HIV/AIDS worldwide as at the end of 2009, 52% were women (Odhiambo, 2012). In 2005, the UNIADS estimated that 36.7 million people were living with HIV, of which 25.7 million are in Africa (UNAIDS, 2016). It can therefore be argued that HIV/AIDS has reached epidemic proportions worldwide. Though sexually transmitted infections are spread out across Africa, there are regional variations in the spread. For instance, prevalence in Madagascar is less than one percent while in Botswana and Tanzania and other places on the continent, it's over ten percent (UNAIDS, 2016). In Ghana, the HIV prevalence was estimated at 1.47 percent as at 2014 (GAC, 2015).

The most common type of STI infection in Ghana are syphilis, gonorrhea, hepatitis B, herpes, chlamydia, genital warts, yeast infection (candidiasis) and HIV. Sexually transmitted infections could be a co-factor for HIV acquisition and transmission especially for specific sexually transmitted infections such as syphilis, chancroid and genital herpes (Fatusi & Wang, 2009) (Lusti-Narasimhan et al., 2011) in most cases the former precedes the latter. Although HIV cannot only be contracted through sexual intercourse, there is a greater likelihood for one to get infected once a partner already has the virus. This facilitates transmission of the HIV virus to the next host.

The practice of Multiple Sexual Partnerships is often linked with sexually transmitted infections, pregnancies, abortions as well as other reproductive health concerns (Chialepeh & Sathiyasusuman, 2015). The practice is often associated with frequent acts of sexual activity and greater number of sexual partners.

It is not uncommon to find people engaging in risky sexual behavior. Multiple sexual partnership as a phenomenon is not new in Africa. For ages, Africa has had a strong tradition of multiple sexual partnerships, which is practiced in marital unions as well as outside of marriage (concubinage) in many African societies (The Soul City, 2008). Risky sexual behaviour (multiple sexual partners) has over the years been documented as the driver for the spread of sexually transmitted infection. Susceptibility to infection is dependent on the sexual behaviour of the person.

1.2 Statement of the Problem

Sexually transmitted infections have a great impact not only on sexual and reproductive health, but also on disability, mortality and economic development (Nasir et al., 2015). Sexually transmitted infection is the 5th leading contributor to the Disability Adjusted Life Years (DALY) (CDC & World Bank, 2008). In 2013, the WHO estimated syphilis in pregnancy accounted for 305,000 neo-natal and fetal deaths, with about 215,000 infants having an increased risk of dying from premature deaths, low birth weight or congenital diseases each year. The report further posits there were about 530,000 reported cervical cancer cases, of which about half resulted in death. Also, sexually transmitted infections such as chlamydia and gonorrhea can cause infertility if left untreated, and syphilis or HSV-2 Herpes Simplex 2 increases HIV acquisition by three folds. (WHO, 2013).

Some sexually transmitted infection increases the individual's risk to other health complications. Though the prevalence of sexually transmitted infections in any given population may be low, it comes with other sequels of ailments such as sterility, pelvic inflammatory diseases, chronic pelvic pains, spontaneous abortions for the young woman,

and sometimes infection from mother to the unborn child, through vertical transmission, and ultimately, death (WHO, 2013; Newman et al., 2015).

In many African societies including Ghana, people who talk about sex openly are tagged as delinquents in the society especially when they are young. This makes it difficult for young adolescents to seek knowledge on their sexual and reproductive health. Little or no anonymity exists in the health care system and the stigma attached to anything of the infection prevents infected people from seeking healthcare as well as abandonment and loss of respect from friends and family members because the infection is mostly acquired through excessive sexual intercourse by people of poor moral values (CDC & World Bank, 2008).

In cases where one partner becomes sterile as a result of STI, the other partner resorts to relationships outside marriage, in order to have a child, creating a vicious cycle of the spread of the infection. Being diagnosed with STI, pregnancy loss or infertility can lead to violence and dissolution of some marriages. A wife's refusal of sex with a partner on suspicion of extra marital affair or diagnosis of an STI, can resort to violence and to some extent dissolution of the marriage (CDC & World Bank, 2008).

There are socio-economic costs associated with sexually transmitted infection. It is ranked among the top 10 reasons for hospital visits. It has cost implication on the individual, household and national budgets on health care provision (WHO, 2007). The economically active population are the population most affected by STIs, as they are also most sexually active in the population. High prevalence of STIs among sexually and economically active population reduces labour force participation with its resultant economic impact.

Unlike developed countries where there is almost universal health care coverage, in most less developed countries, there is high level of unmet need for healthcare services. In Ghana in particular, economic deprivation makes it difficult to pay out of pocket health care cost

associated with STI management and treatment. The scarcity of primary health care services among certain groups of the population perpetuates the infection in the group, where early detection and treatment can cure the infection. There is the existence of a few stand-alone STI clinics in the country and STI treatment or services have been integrated into the existing health care system (GAC, 2015), yet there are little or no trained professionals, and disproportionate distribution of these services; making these services inaccessible to some groups in the population.

Efforts have been made by governments and the global community to curb the situation and create awareness of the dangers associated with risky sexual behaviour, such as multiple sexual partners and unprotected sex which leads to sexually transmitted infections. The awareness of sexually transmitted infections particularly HIV/AIDS is almost universal, and is highest among the population aged 15-49 (GDHS, 2014). Though there is increased awareness of the likelihood of acquiring STI through risky sexual behaviour, multiple sexual partners and unprotected sex, the mere awareness of it however does not mean people are comprehensively informed about the dangers of multiple sexual partnerships and STIs (GAC, 2015).

The phenomenon, multiple sexual partnership, and sexually transmitted infections, cannot be studied in isolation due to the multifaceted and causal effects of one on the other. To a large extent, the available studies on multiple sexual partnerships and STIs have had a strong western and eastern focus, mostly dominated by American studies. In the African case, some respectable amount of literature can be found on the concept, although with a tilt towards Southern and East Africa with emphasis either on women, adolescents or young adults. The net effect of this is that though occurring as a phenomenon, there is no clear evidence on the dynamics of multiple sexual partnerships and sexually transmitted infections in West and North Africa. What exist at best are isolated studies, which in themselves, are not enough for

justifiable and generalizable inferences to be made about the phenomenon. This presents a clear gap that needs to be addressed. This study therefore seeks to add to the scant empirical evidence on multiple sexual partnerships and its relationship with STIs in the West African setting, with a primary focus on Ghana. This study investigates multiple sexual partnerships and sexually transmitted infection with particular emphasis on people in their reproductive ages (15-49 years) in Ghana.

1.3 Rationale

The 2008 and the 2014 Ghana Demographic and Health Survey respectively have reported increase in the number of sexual partners for both males and females (GSS, GHS, & ICF, 2008; 2014), specifically among the youth 15-24 years. In both the 2008 and 2014 surveys, increases were recorded in percentage of people with multiple sexual partners for all age groups except females aged 25-29 years, where there was a decrease of 0.2%.

Table 1: Percentage of People with Multiple Sexual Partnerships

	FEMALES		Males	
AGE GROUP	**2008**	**2014**	**2008**	**2014**
15-24	1.4	2.2	5.9	7.9
25-29	1.7	1.5	16.7	18.1
30-39	0.5	0.6	15.5	17.4
40-49	0.2	0.4	12.4	18.3

Source: GDHS, 2008, 2014

Multiple sexual partnerships, in and of themselves are not a problem, at least from a public health perspective. Other behavioral practices, for instance condom use, may be crucial mediators of the relationship between multiple partnerships and STI. In spite of all the education and campaigning against risky sexual behavior, studies have continued to show

that the prevalence of multiple and concurrent partnerships is on the increase. This study examined condom use as a mediating factor between multiple sexual partnerships and STI.

An understanding of the relationship between sexual behaviour and the risk of sexually transmitted infection is imperative to the development of STI/HIV prevention strategies (Johnson et al., 2009). Policymakers need detailed knowledge of the relative numbers of new infections occurring in different sub-populations and risk groups in order to respond effectively (Bertozzi et al., 2008;Piot et al., 2008).

1.4 Objectives

The general objectives of this study is to investigate the relationship between multiple sexual partnerships and the incidence of sexually transmitted infections among Ghanaians in their reproductive ages.

Specifically, the study aims to:

1. Examine the incidence of sexually transmitted infections among sexually active persons.
2. Examine the relationship between multiple sexual partnerships and sexually transmitted infections.
3. Examine the relationship between multiple sexual partners and other selected socio-demographic variables as an explanatory factor to the incidence of STIs.

1.5 Organization of the Study.

This study is organized into six (6) chapters. The first chapter introduces the study by giving a background to the study, statement of the problem, the rationale of the study and the study's objectives. This then leads to Chapter two (2), which is a review of relevant literature

pertaining to the factors relating to multiple sexual partnerships and sexually transmitted infections, a conceptual framework as well as hypotheses. Chapter three (3) presents the methods used for the study.

Chapter four (4) undertakes an analysis of the demographic and socio-economic characteristics of respondents in the study. The chapter has 3 sections, section 1 presents a descriptive information of the sample through charts and tables. The second section presents information on the bivariate results where associations were tested on demographic variables on sexually transmitted infected infections. The third section presents result from a multivariate analysis, which was used to tell the extent of influence of the selected demographic variables on sexually transmitted infections.

Chapter five (5) undertakes a discussion of the findings of the study in light of findings of similar studies undertaken elsewhere in the world and Chapter six (6) undertakes a discussion of the summary, conclusion, and recommendations of the study. This then draws the curtain on the entire work, bringing the work to a close.

CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction

This chapter reviews the literature on sexually transmitted infections and associated risk factors. Most of the work reviewed is from sources across the world relevant to sexually transmitted infections. It highlights behavioral and socio-demographic factors that put an individual at risk of infection.

Being at a higher risk of sexually transmitted infection is determined by cultural, socio-economic and environmental factors including age, place of residence, income levels and number of sexual partners, just to mention a few.

2.1. Gender Inequality

Women are disadvantaged in the spread as well as acquisition of STIs. Biological factors put women at higher risk of infection compared to men. The lining of the vagina is thinner as compared with the skin of the penis, thereby being a moist place for bacteria to grow. Also females normally have vaginal discharge, burning or itching (yeast infection), which mimic symptoms of STI (CDC & World Bank, 2008). Gender inequality affects the capacity of women to choose with whom, when and how sexual intercourse should happen. This predisposes women to a greater risk of sexually transmitted infection than men.

Cultural factors put women in a disadvantaged position too. In many African societies and in some other parts of the world, women are expected to be in a monogamous relationship while it is accepted for a man to live a promiscuous life. Sexual relations between a married woman and a man other than her husband is not allowed, but sexual relationship between a married man and any woman other than his wife is allowed (Anarfi, 1993). It is even culturally

acceptable for a man to have more than one wife in some societies. For example, among Muslims, men are allowed to have more than one wife, however there is no such allowance for a woman to have more than one husband "Quran, Sura 4 (An-Nisa) Aya 3". Further, polygyny is practiced in many societies and religions in the world whilst polyandry is extremely rare (The Soul City Institute, 2008).

The number of sexual partners one has determines their reputation. The more sexual partners a man has, the better his reputation, on the contrary for women, the fewer the better, and limiting the number of sexual partners attracts a respectable partner (Oliffe et al., 2012).

Social dynamics such as marriage and economic dependence on men transfer power from the woman to the man (Bingenheimer, 2011). A woman married to a promiscuous husband is supposed to give in to the demand for sex in her role as a wife, even when she suspects the husband might have had an extramarital affair or she is in a polygamous marriage.

More often than not, men hold the bargaining power and may choose to practice safe sex or not. Women do not have much say, and this increases their likelihood of acquiring a sexually transmitted infection.

2.2. Mediating Factors

2.2.1 Multiple Sexual Partners

Having multiple sexual partners has been documented to be associated with an increased prevalence of sexually transmitted infections (Chandra et al., 2011). One stands a higher chance of infection by having multiple sexual partners (Karata & Mkoma, 2007).

Having multiple sexual partners could be a factor of individual personal characteristics or a reflection of the environment (Santelli et al., 2004). In some parts of the world, mostly

African countries, males are expected to live a promiscuous life while females are expected to be virgins until marriage. In some traditional settings and among some religious groups, a man can marry more than one woman. In marital unions, one can have extra marital affair when the spouse is not sexually adventurous, and males usually have multiple sexual encounters with younger females who are willing to experiment new sexual positions in bed (The Soul City Institute, 2008). Studies have shown that young people are more likely to report multiple partners for reasons such as peer pressure, low self-esteem, material gains and demonstration of virility (Parker, 2011). An increase in number of sexual partners greatly increases vulnerability to STI infection (Rector et al., 2003). A study in Zimbabwe (Parker, 2011) found that, a reduction in number of sexual partners is associated with declines in the prevalence of sexually transmitted infection.

2.2.2 Consistent Condom Usage

Condoms have been acknowledged to prevent transmission and acquisition of sexually transmitted infection among heterosexual partners (Exavery et al., 2011). Effective usage prevents an uninfected person from acquiring (primary prevention) and an already infected person from spreading the infection (secondary prevention) as long as the condom covers the infected area (Ramjee et al., 2015). Nevertheless, consistent usage does not necessarily prevent infections. Studies conducted by others have proven that failure of condom usage despite the high awareness in most African countries is rather behavioral than mechanical (Ramjee et al., 2015). Some reasons advanced for failing to use condoms included the perception that it is a sin to waste sperms, condoms cause sores on the penis, and raises issues of trust and suspicion of infidelity of one party (Exavery et al., 2011).

Other studies have found that there is high knowledge of condom among people, but also found however that the consistent usage of condoms is a problem. In Africa and most parts of the world, people use condoms at their first sexual encounter only to stop using them after a period of time (Exavery et al., 2011). This happens especially when relationships have moved from casual sexual intercourse to established ones where intimacy and trust rises and the perceived risk of STI transmission greatly reduces (Mevissen et al., 2011).

A study in Tanzania, Exavery (2011) found out that condom usage was high among people who have knowledge of sexually transmitted infections compared to people who have little knowledge of STI. Couples use hormonal or oral contraception to avoid unwanted pregnancies, which makes the use of condoms redundant if the perceived risk of contracting STI is low (Mevissen et al., 2011).

2.3. Socio-economic and Demographic Factors

2.3.1 Sex

Sexual behaviour of the sexes differ and effects of infections are felt differently. Unlike males, females are usually more conservative when it comes to sex (Leiblum et al., 2010). The hegemony of masculinity makes males value valor in sexual encounters thereby increasing their risk of infection (Oliffe et al., 2012). Males most likely go with masculine ideals by delaying health seeking when experiencing symptoms of infection (Oliffe et al., 2012). Females, who report fewer sexual encounters, however, are disproportionately affected by sexually transmitted infections and suffer long term effects biologically (CDC, 2011). A study in Peru found that early sexual initiation was associated with Chlamydia among women irrespective of number of partners and age (Sanchez et al., 1996).

2.3.2 Age at First Sex

Early initiation to sex is a risk factor for infection. Early sexual debut is associated with unprotected sex, multiple sexual activity, unwanted pregnancies and multiple sexual partners (Karata & Mkoma, 2007; Ghebremichael & Finkelman, 2013). Time spent single after sexual initiation is highly associated with contracting STI (Awusabo-Asare et al., 2004;Bongaarts, 2007). The significance rises as the years of exposure to the infection rises (Bongaarts, 2007). A study in Tanzania (Ghebremichael & Finkelman, 2013) found the duration between first sex and first marriage to be significantly higher for women who tested positive for HIV. Thus a year's increase in premarital sex (time between first sex and marriage) increases the odds of contracting STI by 7%, with that of having multiple sexual partnerships (MSPs) doubling with a unit increase in premarital sex.

Early sex exposes the individual to a pool of sexual partners before they get married. Early sexual exposure may be as a result of peer pressure, rape or coercion. Among females, most first sexual encounters are with older people who have had multiple sexual partners and may be carriers of the sexually transmitted infections (STIs). However, other studies have found rather early marriage contributes to the spread of STIs as most young girls are married early to older, experienced men, who might be carriers of the sexually transmitted infection (Bongaarts, 2007).

2.3.3 Age

The age of a person will have an influence on his or her sexual behaviour (Chandra et al., 2011). STI infection is high among young adults. Sexually active adolescents usually engage in short-lived relationships (Karata & Mkoma, 2007) . As age increases, the number of

sexual partners ones has decreases, presumably because most people at older ages are in marital unions or are in committed relationships as compared to people in younger ages.

Younger people are most vulnerable to STIs (Exavery et al., 2011) as they are more likely to engage in risky sexual behaviour such as multiple sexual partnerships, failure to use barrier methods, substance abuse and early age at sexual debut.

Younger people are thought to be more susceptible to some STIs, for instance HPV, which is acquired for the first time presumably at the onset of sexual activity (WHO, 2004). A study in Nigeria detected chlamydia was the most common infection detected among 17–19-year-old sexually active teens, however, the prevalence declined as age increased (Agha, 2007). A surveillance report in USA (CDC, 2014) found that chlamydia infection was highest among youth and young adults, and declined as age increased. A study in Netherlands among female sex workers also found a significant association of chlamydia, gonorrhea and hepatitis B among young sex workers (Verscheijden et al., 2015).

The younger the individual, the lesser his or her knowledge will be on sexually transmitted infections. Teens who talk with their parents openly about sex are more likely to delay sex or use barrier methods if they have sex, thereby reducing their risk of contracting an STI (CDC, 2012). However, a study in Netherlands found otherwise; that the probability of having a history of STI increased with age until 35 - 44 years and decreased afterwards (Van bergen et al., 2007).

2.3.4 Highest Level of Education

Awareness and knowledge of STI increases with education (Reid, 2005). One could say highly educated people will have knowledge of sexually transmitted infections and will take

precautionary measures not to engage in risky sexual behaviour, compared with less educated people. Educated people can acquire knowledge when exposed to sources of information through the mass media (print, radio and television) (Hossain et al., 2014). Measures carried out to change sexual behaviour have been effective among people with higher levels of education (Lichtenstein et al., 2008).

Education has been found to increase access to financial resources (Bingenheimer, 2011; Painter et al., 2012), and therefore helps build one's income generating potential. People with low income are likely to engage in risky sexual behaviour such as offering sex for money or other material gains (Ramjee et al., 2013). In relation to income, other studies have also found that this enables mostly men to engage in risky sexual behaviour because they can afford it (Berhan & Berhan, 2015).

A study in the US found adolescents not enrolled in high school were likely to initiate sex early and have unprotected sex, whereas increase in education up to tertiary level protects against vulnerability to STI (Annang et al., 2010).

A study by (Bingenheimer, 2011), found that a strong association between higher levels of education and STI diminished over time. Other studies in the US have found higher levels of education puts especially women at higher risk of HIV infection due to the high prevalence in tertiary institutions (Annang et al., 2010). College education has been characterized with liberty to explore sexual prowess. Most females in tertiary institutions enter into relationships with commitment whereas only a few males are in such committed relationships.

2.3.5 Region

Susceptibility to infection is dependent the level of prevalence in a given geographical area. The prevalence of sexually transmitted infection varies by region of residence (Dodoo et al., 2007) as well as the facilities available in the region of residence. Some regions have over the years recorded high prevalence of infection. The Eastern region of Ghana has over the years had the highest prevalence of infection (GAC, 2015). The Central region however recorded the highest prevalence of 4.7% in 2011, dropping to 1.9 in 2012 and further down to 1.4 in 2014 (GAC, 2015).

2.3.6 Type of Place of Residence

Rural dwellers as compared to urban dwellers have an unfair distribution of resources: access to health facilities, trained health workers as well as recreational facilities. Some STIs are preventable and upon early detection, and can be treated by administering the right antibiotics (WebMD, 2016). Urban dwellers have high awareness of STI and report early STI signs and therefore receive treatment earlier than rural dwellers. People in the rural areas may face challenges which do not encourage health seeking behaviors such as poverty, poor road networks, little facilities and little anonymity on STI related services (Boyer et al., 2006).

Urban dwellers start sexual activity earlier than rural dwellers (Anarfi, 1993) but due to lack of recreational facilities in the rural areas, rural dwellers are likely to engage in risky sexual behaviors which might lead to STI acquisition. Lower levels of condom usage have been recorded in the rural areas than the urban areas, and this may be linked to cultural norms and access to information (Exavery et al., 2011). Other studies in Kenya have also found that with respect to access to health services, rural dwellers are better off than some urban dwellers especially when they live in slums where there is economic deprivation (Dodoo et al., 2007).

2.3.7 Religion

The presence or absence of religion has an influence on a person's sexual behaviour. Religion has been argued as a strong determinant of morality, if not its basis (Anarfi & Adobea, 2011). People belonging to religious groups are sexually normative than people of no religious association (Leiblum et al., 2010), implying non-religious people have sexual liberality, increasing their chances of infection.

There are varying beliefs among the religious groups and as such their doctrines and practices differ. A study by Anarfi (1993), found that Christians and non-religious people have earlier sexual debut than Muslims and traditionalists. Another study by Odhiambo (2012), in sub-Saharan Africa found the chances of engaging in risky sexual behaviour decreased by 62% by being a Muslim relative to non-Muslim. To affirm this, other studies in Saudi Arabia have found a negative relationship with HIV/AIDS and being a Muslim (Madani, 2006).

Some religious groups promote preventive strategies such as "safe sex" whereas other groups deem such strategies as promotion of pre-marital sex and that sex should only be consummated in marital unions (Anarfi & Adobea, 2011). A study in Trinidad and Tobago (Gillian & Brathwaite, 2005) found low incidence of STI cases among Hindus. People of this group see being infected with any of the diseases renders the body unholy and infected people are expected to keep away from the organized worship.

2.3.8 Ethnicity

There are differences in the prevalence of infections among ethnic groups. In America the risk of STI infection is patterned by race, with higher infection recorded among blacks compared to whites (CDC, 2014) . Blacks engage more in risky sexual behaviour than whites. Also, people of certain groups have a high chance of infection by selecting an already infected person as a sexual partner because of the prevalence in that group (Turner et al. 2004).

Arguably, the prevalence or incidence of infections are not as a result of color or heritage but social constructs, poverty, segregation and low educational levels. As cited by Lichtenstein et al. (2008), because of the Tuskegee experiment where 400 African-American men were denied treatment for syphilis in Alabama, blacks have a mistrust in the health system in US. It can be argued however that whites patronize private hospitals because they can afford it, whereas blacks, who cannot afford, go to public hospitals for treatment, where majority of the statistics come from. Similar studies have found higher levels of infection among people with African-American and Hispanic descent than Americans of European descent (Kaplan et al., 2009; PHE, 2016).

Majority of ethnic groups in Africa are racially homogenous; however, there are socio cultural factors that govern sexual behaviour in each group. In general, sexual immorality in Ghana is frowned upon, nonetheless permissible among some ethnic groups as a result of geographic and socio-economic factors (Gyimah et al., 2010). People belonging to the Northern tribal groups like the Mole-Dagbani are less likely to indulge in risky sexual behaviours thereby decreasing their chances of infection as compared with people in the southern tribal groups (Anarfi, 1993). Nonetheless, among the Northern tribal groups, practices such as child marriage which predispose youngsters to early sexual debut and sexually transmitted infections, are rampant (Madise et al., 2007).

2.3.9 Wealth Quintile

Wealth (money) has been spoken of as a driver for sexual relationship (Pettifor et al., 2004). Having money facilitates sexual relationships with other people since the individual can afford to bear the added costs associated with maintaining extra sexual partners. On the other hand, a poor person is also at high risk of STIs because she or he does not have the resources (money) to seek treatment (Harling et al., 2014). Also as result of coping mechanisms, poor people use sex for economic gains and are least likely to bargain for safe sex (CDC & World Bank, 2008). The poor are vulnerable to STI-related complications as a result of low access to health care services (Cox, 2011) when some symptoms of infection can be cured upon early detection. In addition, poverty is linked with low levels of education implying access to information of infection issues is not accessible. The rich who mostly have access to such information may change their risky sexual behaviour to safer practices, reducing the incidence of infection among the rich. Low income is associated with low condom usage, implying poor people do not have the means to purchase a condom (Silas, 2013).

2.3.10 Marital Status

Marriage is common in many societies and cultures. It is the only legal setting for sexual intercourse, working as a social control limiting the number of partners one can have in a union (Kposowa, 2013). It is often hypothesized that safe sex is within the confines of marriage where fidelity is a virtue, thus people who have sex outside of marriage have a higher risk of infection as a result of frequent partner change. Unlike people in marital unions, never married, divorced or separated people operate in a sexual network and have a higher risk of having sexually transmitted infections (Kposowa, 2013) .

There is a lot of sexual activity in marital unions as well as minimal usage of barrier method (Bongaarts, 2007), and so infection of a partner can spread the infection to the other. On average, people spend more years in marriage than they spend being sexually active before and after marriage. And though the infection rate in marital union is low as compared with non-marital unions, the prevalence of STIs is high in marital unions as most infections happen in marital unions despite the low incidence of STI (Bongaarts, 2007). Other studies in Zambia have found that early age at marriage has an association with STIs. Many of the women marry at a younger age to older sexually active men and are under pressure to start having children and cannot negotiate for condom usage (Nour, 2006).

2.3.11 Working Status

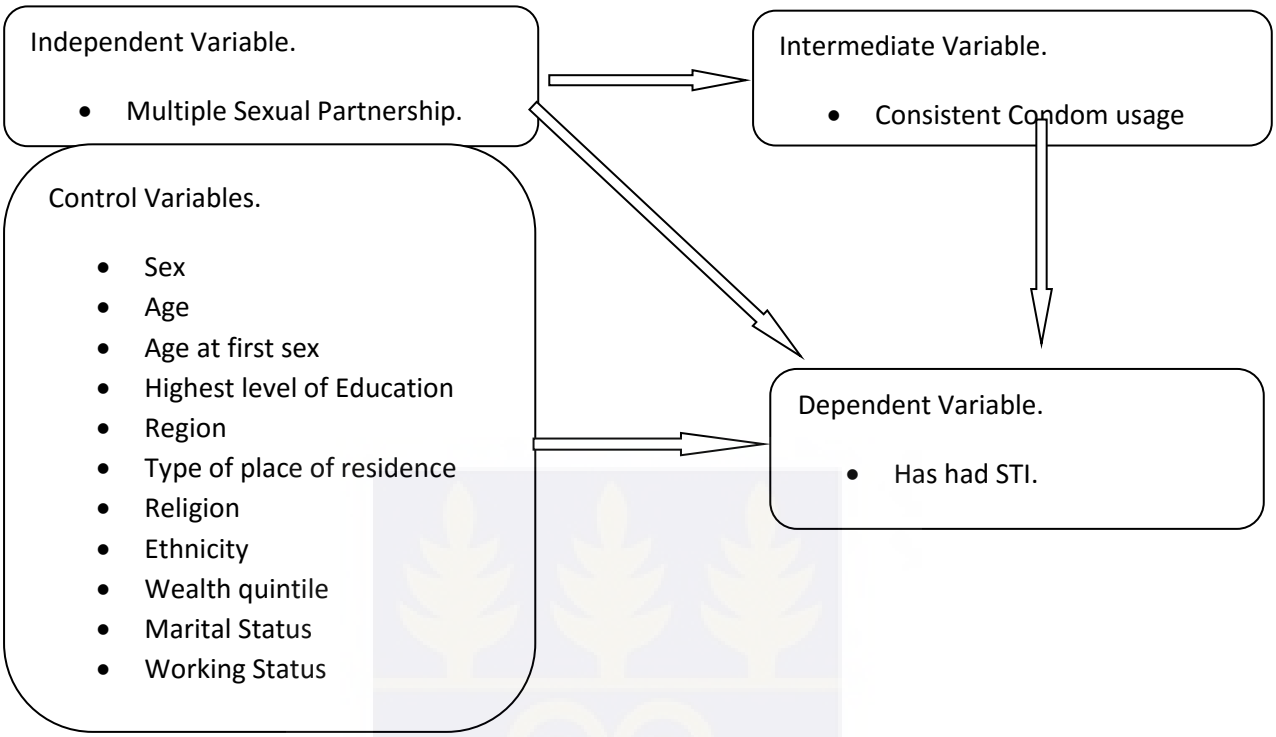
Working status can be a risk factor for sexually transmitted infection (Nyarko et al. 2014) as well as a risk factor for the spread of infection (Wang & Gao, 2000; Schendre & Rajnarayan, 2005). A study in India found a lot of STI cases among people with unskilled profession, where most are unemployed (Poudel et al. 2004). Low levels of employment among females in addition to low education causes women to engage in risky sexual behaviour. Having an assurance of quick cash after sex without qualification has appealed women to offer sex to meet basic needs, thereby increasing their chances of infection (Odhiambo, 2012). Contrary to the above, another study in China also found self-employed in comparison to state employed people were likely to have unprotected sex with casual partners (Wang & Gao, 2000). On the other hand, some anecdotal sources in Ghana claim that unemployment is emasculating and some unemployed men use sexual prowess as a means of regaining their masculinity.

In addition, the kind of work a person does may place him/her in a position to engage in risky sexual behaviour thereby increasing their chances of infection. Particularly, occupations that require people to move from home and away from their partners have a higher rate of infection than others in occupations that do not require movements from home. Long-distance drivers, fishermen and miners have high rates of infection where sex workers are the source of infection (Schendre & Rajnarayan, 2005).

2.4. Conceptual Framework

Literature reviewed shows a relationship between number of sexual partners (multiple sexual partnerships), and acquisition of sexually transmitted infections. Other factors that can influence STI acquisition include: consistent condom usage, age of the respondent, age at first sex, educational status, region and place of residence, religion, ethnicity, wealth index, marital status and working status.

Figure 1: Conceptual Framework Showing the Relationship Between Multiple Sexual Partners and Sexually Transmitted Infection.



Source: Adapted from (Ogden 2004)

2.5 Hypotheses

The study proposes the following hypotheses based on the literature reviewed.

1. People with only one sexual partner are less likely to have sexually transmitted infection than people with more than one sexual partner.
2. People who use condoms consistently are less likely to have sexually transmitted infections than those who do not.
3. People in marital unions are less likely to have sexually transmitted infection than those not in marital unions.
4. Females are more likely to have sexually transmitted infections than males.

CHAPTER THREE
METHODOLOGY

3.1 Introduction

This chapter presents an overview of the study area, discusses the research design, data source and analyses and ethical considerations pertaining to this study.

3.2 Study Area

Ghana is a developing country located on the west coast of Africa. The country is surrounded by three francophone countries; Cote D'Ivoire to the west, Burkina Faso to the north and Togo to the East, and to the south is the Gulf of Guinea. There are 10 administrative regions and 216 districts and the total population of the country is 27 million (GSS, 2013) with two regions, namely Ashanti and Greater Accra regions, constituting about 50% of the population. The country has a sex ratio of 95.2 males per 100 females as of 2010. (GDHS, 2014).

3.3 Source of Data

Data used in the study were from the Ghana Demographic and Health Survey (GDHS) 2014. The study was conducted by the Ghana Statistical Service (GSS) in collaboration with Ghana Health Service (GHS) and ICF International, with funding from USAID and the Global Fund through the Ghana Aids Commission. Questionnaires used in the study were based on DHS templates but were modified to suit health issues in Ghana and translated into the major local languages. Household, male and female questionnaires were used to collect information in the field.

Some demographic and health information was collected on various topics including contraceptive usage, fertility, migration, mortality, reproductive health and sexually transmitted infection. The sample drawn for the survey is representative and can therefore be generalized to the population. The data used in this study are from the male and female questionnaire.

3.4 Sample Design and Selection

The sample used was an update of the Population and Housing Census from the GSS. As at the time of the study, there were 216 districts in the Ghana. Two sampling techniques were adopted; first, the districts were divided into 427 clusters with 216 in urban and 211 in rural areas. At the second stage, 30 households were randomly selected from each cluster, making 12,831 households. Men and women in their reproductive ages (15 – 59 for males and 15 – 49 for females) were eligible for the survey.

In the GDHS 2014, 9396 females and 4388 males responded to the questionnaires, however, for the purpose of this study, only people who had sex in the 12 months preceding the survey were selected, since these participants are the ones most at risk of acquiring STIs. Thus, 6616 females and 3072 males who met this criterion form the sample for this study.

3.5 Methods of Analysis

The analyses was carried out at three levels using Stata and SPSS (for inferential analysis) and Microsoft excel for tables. Univariate analyses were used to show the characteristics of the sample in summaries, means, frequencies and proportions. Bivariate analyses were used to examine the association between two variables, a Pearson correlation test was used to test

the relationship between two continuous variables, in this case age at first sex and having had STI which was measured as a dichotomous variable (discrete continuous variable) 1 “Yes” and 0 “No”. Also cross tabulations were used at the bivariate level, with chi-square testing the significance at 95% confidence level, the association between the independent (multiple sexual partnerships) and dependent (STI infection) variables, the intermediate variable as well as the control variables to determine whether there existed some significant difference between them. At the multivariate analysis level, a binomial logistic regression was employed because the outcome variable was dichotomous, yes or no. This was used to establish the extent to which having multiple sexual partnerships (MSP) influences one acquiring sexually transmitted infection whiles controlling for selected demographic indicators.

3.6 Variables/ Measures

Four sets of variables (dependent, independent, control and intermediary) were from the 2014 GDHS, however, for some variables such as STI status, proxy measures had to be employed, because where there were no direct measures of them in the data.

3.6.1 Dependent Variable

The dependent variable was whether the person had experienced any symptom of STI in the last 12 months. Because there was not a variable explicitly asking STI status, a proxy technique was used to deduce whether they have experienced any of the symptoms. Participants who reported to have experienced any of these – genital discharge, genital sore/ulcer or know they have had and STI in the last 12 months of the survey were of interest for this study. Due to the low incidence or prevalence of each symptom of STI mentioned in the questionnaire, all STI symptoms measured in the GDHS were used. If a respondent

mentioned 'Yes' to any of the STI symptoms, he or she is coded as "Yes". Respondents who responded 'No' to all of the symptoms were coded as "No".

3.6.2 Independent Variable

Multiple Sexual partnerships. For the purpose of the study, only people who had had sex in the last 12 months were considered. This variable was ordered and respondents put in groups based on the number of sexual partners one had had in the given time frame. Respondents were put into three categories, "1" for people who have had only one sexual partner, "2" for people who have had two sexual partners and "3+" for people who have had 3 or more sexual partners.

3.6.3 Intermediate Variable

Although STIs cannot only be transmitted through vaginal sex, condom usage plays a major role in preventing the transmission of STI among heterosexual couples. People who used condom at every sexual intercourse in the time frame under consideration were coded as "Yes", "No" if the person did not use a condom at every sexual intercourse with the partner and a third category "stable unions" for people who are married and have had only one sexual partner in the last 12. The third category was created because people cannot always use condoms in marital unions.

3.6.4 Control Variables

To better understand the association between having multiple sexual partnerships and the risk of acquiring STI, other demographic and socio-economic variables were included to help

explain the relation between the dependent and the independent variables. Respondents' personal characteristics such as age, age at first sex, education, region of residence, type of place of residence, religion, ethnicity, wealth quintile, marital status and working status were included in control variables in the model.

Age of respondent was put into categories, 15-19, 20-29, 30-39 and 40-49 years. For the basis of comparison among males and females, males age over 50 years were not included in the sample. Age at first sex was left as a continuous variable, in the data, some recorded their first sex happened in marital unions, in such cases their age at first cohabiting was used as a proxy for age at first sex. Religion was also re-categorized; Catholic, Anglican, Methodist, Presbyterian, Pentecostal/Charismatic and Other Christian were put under one category as Christians. People belonging to no religious group were added to people belonging to "other" religious group, the numbers in the 'other religion' and 'no religion' categories were small in the sample and as such the two categories had to be merged as one. Ethnic groups were further re-categorized; Guan, Grussi, Gruma and Mande were added to the other ethnic category. Marital status was further regrouped into three categories, 'married' and 'living together' were put under the same category as married, separated and divorced women were put in the category as formerly married, whereas never married was not re-categorized. Other variables used in this study were left as they were measured in the GDHS data set.

3.7. Weight

As a result of the non-proportional sampling from the regions and rural and urban areas, sample weights were applied to the data set to make the analysis representative of the national population (GDHS, 2014). The weighting variable was derived by dividing the

sample weight variable (v005) by 1,000,000, after which the resultant was then applied in the analysis.

$$\frac{v005}{1{,}000{,}000} = weight$$

The weights computed were necessary to estimate valid proportions and means.

3.8 Limitation of the Study

Several types of STI such as Hepatitis, HIV, Chlamydia, Gonorrhea, Syphilis, Herpes, Yeast Infections and Pelvic Inflammatory diseases, among others, are in existence. However, the data available only covers genital ulcers/sores and genital discharge in the last 12 months prior to the 2014 DHS study. Prevalence of STIs in this study has therefore been measured based on only on these two symptoms as well as the person knowing she or he have had STI in the last 12 months preceding the survey. In addition, there were no laboratory tests to affirm or deny a person's STI status, the questions used in the survey rather relied on only self-reported answers to sexually transmitted infections, "Now I would like to ask you some questions about your health in the last 12 months. During the last 12 months, have you had a disease which you got through sexual contact?" Some sexually transmitted infections are asymptomatic (there could be an infection without the person knowing); these self-reported responses therefore could not give a true picture of the prevalence or incidence of the infection in the population. Also, although sexually transmitted infections are usually contracted through sexual contacts, there is the possibility for some infections to be contracted through using facilities such as public toilets.

In determining religiosity, religious affiliation (religion) was used as proxy to determine a person's religiosity. This is as a result of lack of data on religiosity in the GDHS dataset.

Also, as a result of social desirability, males are more likely to report more sexual partners they have had whereas females are more likely to under report the number of sexual partners had in the period of the study. Society accepts promiscuity amongst men but frowns on such behaviours for females. Also, the information given on the number of sexual partners may be affected by memory recall. Due to the time interval, people (both males and females alike) may not be able to recall all the number of sexual partners they had had in the reference period. In addition, with respect to age at first sex, some respondents provided age at first cohabiting as age at first sex. However, there were some responses that were flagged as inconsistent with the information provided. As mentioned earlier, only people who have been sexually active in the last 12 months were considered for the interview.

Also, data available in GDHS 2014 does not provide the exact information of respondent's occupation in determining occupations that involves mobility, and as such working status had to be categorized as working or not working.

CHAPTER FOUR

DEMOGRAPHIC, SOCIOECONOMIC CHARACTERISTICS OF RESPONDENTS

4.0 Introduction

This chapter is broken into three sections. The first describes the background characteristics of the study population with respect to socio-demographic and socio-economic characteristics. The selected characteristics are sex, current age, age at sexual debut, religion, wealth quintile, marital status, and working status. The second section deals with the bivariate analysis while the third addresses the multivariate component of the work.

4.1 Univariate Analysis

4.1.1 Sexually Transmitted Infection.

Among a sample of 9406 sexually active individuals, 21% reported having had symptoms of sexually transmitted infection (STI) during the 12 months preceding the survey Table 2. These people indicated that they had experienced genital sores and genital discharge in the 12 months prior to the study. Thus in the sample, one out of five sexually active individuals has had a symptom of STI in the last 12 months.

Table 2: Incidence of STIs among Sexually Active Persons

	N	%
Has had STI		
No	7396	78.60
Yes	2010	21.40
Total	9406	100.00

Source: Computed from GDHS (2014)

4.1.2 Mediating Factors

4.1.2.1 Multiple Sexual Partners

Number of sexual partners is believed to have an influence on an individual's chances of infection. Majority of respondents (93%) had had only one sexual partner in the 12 months preceding the survey. Less than 10% of the respondents reported having more than one sexual partner in the last 12 months (Table 3).

Table 3: Univariates, Mediating Factors

Mediating Factors	Number	%
Number of Sexual Partners		
1	8739	92.91
2	551	5.86
3+	116	1.23
Consistent Condom Usage		
Stable union	6279	66.76
Yes	667	7.09
No	2460	26.15
Total	**9406**	**100.00**

Source: Computed from GDHS (2014)

4.1.2.2 Consistent Condom Usage

Among heterosexual couples, consistent and effective usage of condom irrespective of number of sexual partners greatly reduces the risk of acquiring sexually transmitted infections and unwanted pregnancies. From Table 3, only 7% of respondents used condoms consistently. A little over a quarter (26%) of respondents did not use condoms consistently during sexual intercourse. Majority of the respondents (67%) were in stable unions or had only one sexual partners.

4.1.3 Characteristics of Respondents

The entire sample for the study was 9406 respondents of which 2170 (29%) were males and 6700 (71%) were females (Table 5). Respondents were aged between 15 and 49 years.

4.1.3.1 Age at First Sex

In many African countries, sexual intercourse ideally commences and is allowed only in the confines of marital unions. Among young women, until passage rites (dipo and bragoro in the case of Ghana, which marks transition from childhood to womanhood) have been performed, the young woman is not allowed to have sex. People who flout these rules are sometimes punished (ostracized from the community). However, as a result of modernization and urbanization, these practices have lost their value. From Table 4, the mean age at sexual debut was 18.21 years with a standard deviation of 3.68 years. The earliest recorded age at first sex was 8 years and the oldest age was 42 years.

Table 4: Respondents' Age and Age at First Sex

	N	Mean	SD	Min	Max
Age of Respondents	9406	31.91	8.72	15	49
Age at first sex	9406	18.21	3.68	8	42

Source: Computed from GDHS (2014)

4.1.3.2 Age of Respondents

From Table 4, we observe a mean age of 31.9 years and a standard deviation of 8.7 years regarding age of respondents. From Table 5, we observe people in age group 20-29 were

more than any other group (35.72%). Following closely were those in age group 30-39 (33.58%). People aged 15-19 years were the least represented in the sample (7.28%).

Table 5: Descriptive Table Showing Socio-Demographic Characteristics of Respondents

Socio-Demographic Indicators	N (9406)	%
Sex		
Female	6696	71.19
Male	2710	28.81
Age Categories		
15 - 19	685	7.28
20 - 29	3360	35.72
30 - 39	3159	33.58
40 - 49	2203	23.42
Highest Educational Level		
No education	1683	17.89
Primary	1570	16.69
Secondary	5360	56.98
Higher	793	8.43
Region		
Greater Accra	1939	20.61
Western	1106	11.76
Central	971	10.32
Volta	752	7.99
Eastern	912	9.70
Ashanti	1691	17.98
Brong-Ahafo	810	8.61
Northern	717	7.62
Upper East	316	3.36
Upper West	192	2.04
Place of Residence		
Urban	4974	52.88
Rural	4432	47.12
Religion		
No religion/Other	374	3.98
Christian	7389	78.55
Muslim	1411	15.00
Traditionalist	233	2.48

Table 5 continued …

Socio-Demographic Indicators	N (9406)	%
Ethnicity		
Akan	4748	50.48
Ga/Dangme	754	8.02
Ewe	1312	13.95
Mole-Dagbani	1299	13.81
Other	1293	13.75
Wealth quintile		
Poorest	1419	15.08
Poorer	1600	17.01
Middle	1996	21.22
Richer	2116	22.49
Richest	2276	24.19
Marital Status		
Never married	2151	22.87
Married	6656	70.76
Formerly married	599	6.37
Working Status		
Not working	1246	13.29
Working	8132	86.71
Total	9378	100.00

Source: Computed from GDHS (2014).

4.1.3.3 Education

Education is seen as a medium through which knowledge can be acquired. The individual and society benefit greatly from education. As a nation, education speaks to the potential for human capital development. From Table 5, a little over 82 % had been through formal schooling. Majority of the people had attained up to secondary education (57%). The next highest group in the study was people with no education who represented nearly 18% of the sample. Only 8.43% of respondents had up to higher education.

4.1.3.4 Region

From Table 5, the greatest number of respondents were living in the Greater Accra (20.62%) region. Following closely was the Ashanti region (17.97%), then Western region (11.76%), and the Central and Eastern regions with 10.33% and 9.7% respectively. The least represented region was the Upper West region with 2.04% of respondents.

4.1.3.5 Type of Place of Residence

The result presented in Table 5 indicates that more than half (53%) of the respondents were urban dwellers reflecting how urbanized Ghana is in terms of population distribution. Urban residency is increasing as a result of urbanization and modernization. Africa is experiencing one of the fastest rates of population growth as well as rapid urbanization (Dodoo et al., 2007).

4.1.3.6 Religion

Religion represents individual's belief of the supernatural realm, usually identifying with a deity. Religion is important in most Ghanaian societies. Majority of people in Ghana identify with one of the three major religious groups; that is Christianity, Islam and Traditional/Animist religion. Approximately four in five (78.56%) of the respondents identified themselves as Christians whiles about 15% indicated belonging to the Muslim faith and 2.5% indicated being traditionalists (Table 5).

4.1.3.7 Ethnicity

A little over 50 % of the sample were Akan. The next largest group of respondents were Ewe (13.94%), followed closely by the Mole-Dagbani (13.82%). Only 8.02 % of the sample identified themselves as coming from among the Ga and Ga-related ethnic groups (Table 5).

4.1.3.8 Wealth Quintile

From Table 5, the highest wealth status (richest respondents) was about 24.2 %, followed closely by richer respondents with 22.5 %. Only 15 % of the sample was in the poorest category, with 17 % being in the poorer domain.

4.1.3.9 Marital Status

Marriage is an institution common in majority of African societies; either formally (civil or customary marriage) or co-habiting relationships. From Table 5, 70.76% of the population were in marital unions. Nearly 23% of respondents were never married and 6.37 % had once been in marital unions.

4.1.3.10 Working Status

From Table 5, 86.7% of the respondents were economically active at the time of the study. 13.3% of respondents were not working.

4.2 Bivariate Analysis: Relationship of Socio Economic and Demographic Variables with STI

This section presents results on the relationship between explanatory variables and the outcome variable (Sexually Transmitted Infection), and the measured association between them. Contingency tables and chi-square tests were employed to examine the relationship between explanatory variables and the outcome variable. The chi-square test was set at an alpha level of 0.05. An alpha value greater than or equal to 0.05 indicated no association between the explanatory and outcome variables, with a value less than that indicating a significant association.

4.2.1 Mediation Factors and Dependent Variable

4.2.1.1 Multiple Sexual Partnerships and Sexually Transmitted Infection

From Table 6 we notice that among 8739 people who had only one sexual partner, 21.1% had STIs in the last 12 months of the survey. Among people who had 2 sexual partners, 22.5 % had had STIs while 35 % of people who had had 3 or more sexual partners had acquired STIs in the 12 months prior to the study. From the table we can deduce that as the number of sexual partners' increases, the chances of acquiring STI increases as well. From 6, there is a strong association between number of sexual partners and STI acquisition with, a p-value of 0.002.

Table 6: Cross-tabulation Showing the Relationship Between Multiple Sexual Partnerships, Consistent Condom Usage and Sexually Transmitted Infections

Indicator Variables	Has had STI	
	%	Number
Number of sexual partners		
1	21.10	8739
2	22.50	551
3+	34.50	116
	χ^2 (df) = 12.6 (2), P=0.002	
Consistent usage of condom		
Stable union	18.10	6280
Yes	23.40	666
No	29.20	2459
Total	21.40	9405
	χ^2 (df) = 132.25 (2), P < 0.0001	

Source: Computed from GDHS (2014).

4.2.1.2. Consistent Condom Usage and Sexually Transmitted Infection

STIs can be transmitted through kissing, sharing of sharp objects, and sexual intercourse, just to mention a few. Among heterosexual couples, consistent usage of condom greatly reduces the risk of infection by preventing primary and secondary infection as long as the infected area is covered by the condom (Ramjee & Daniels, 2013). From Table 6, it can be observed that 23.4% of those who used condoms consistently had STI whereas 29.2 % of those who did not use condoms effectively had STI. Of people who were in stable union, 18.1% were found to have had STIs. A significant association (p-value<0.0001) was found between consistent condom usage and STIs (Table 6).

4.2.2 Characteristics of Respondents with STI

4.2.2.1 Sex of Respondent and Sexually Transmitted Infection

From Table 8, it can be seen that 26% of females had contracted a sexually transmitted infection whereas only 10% of males contracted such infections. Females are

disproportionately affected by the infection compared to males. Biological and social factors put women in a disadvantaged position. A p-value of less than 0.05 tells of a strong association between sex of the respondent and STIs.

4.2.2.2 Age of respondents and Sexually Transmitted Infection

Age of an individual has an influence on his or her sexual behavior increasing the likelihood of acquiring an STI. Younger people have been reported to have little knowledge and low usage of barrier methods which increases their chances of infection as compared to older people (Nyarko et al., 2014). From Table 8, a significant association ($P < 0.0001$) can be seen between age and STI in the total population. Nearly 32% of people aged 15-19 showed a symptom of STI. Also, 27.8% of respondents aged 20 – 29 had had STIs, followed by respondents aged 30-39 (31.7 %). Ages 45 – 49 had the lowest incidence (13%) of STI. This supports literature that there is a high prevalence of STI among adolescents and young adults (Mayaud & McCormick, 2001).

4.2.2.3 Age at First Sex with STI

The early onset of sex predisposes an individual to STIs. Younger age groups are associated with little knowledge and awareness of sexually transmitted infections (Fatusi & Wang, 2009). The time between first sexual intercourse and marriage leaves an individual with a number of sexual partners, increasing their chances of infection. Biologically, younger girls are not physiologically developed to fight STI infections (Awusabo-Asare et al., 2004). From Table 7, there exists a negative weak relationship between age at first sex and acquiring STI.

This contradicts findings of other studies which show that age at first sex is a strong predictor of STI infection (Fatusi & Wang, 2009).

Table 7: Correlation Between Age at First Sex with STI

Age at first sex	Has had STI in the last 12 Months		
	Pearson R	Sig. (2-tailed)	N
	-.091**	<0.0001	9405

Source: Computed from GDHS (2014).
** Correlation is significant at the 0.01 level (2-tailed).

Table 8: Crosstabulation Showing the Relationship Between Socio Demographic Variables and STI

Indicator Variables	Has had STI	
	%	Number
Sex		
Female	26.0	6696
Male	10.0	2710
	χ^2 (df) = 294.76 (1), P < 0.0001	
Age Categories		
15 - 19	31.70	685
20 - 29	27.80	3359
30 - 39	18.10	3159
40 - 49	13.00	2203
	χ^2 (df) = 236.24(6), P < 0.001	
Highest Educational level		
No education	20.30	1683
Primary	21.10	1570
Secondary	22.80	5361
Higher	14.40	792
	χ^2 (df) = 30.56 (3), P < 0.0001	

Table 8 continued…

Indicator Variables	Has had STI	
	%	Number
Region		
Greater Accra	21.00	1939
Western	17.10	1106
Central	17.20	971
Volta	26.60	752
Eastern	17.20	912
Ashanti	21.20	1691
Brong-Ahafo	29.80	809
Northern	21.10	718
Upper East	10.80	316
Upper West	17.20	192
	χ^2 (df) = 141.58(9), P < 0.0001	
Type of Place of Residence		
Urban	22.80	4974
Rural	19.80	4431
	χ^2 (df) = 12.63 (1), P < 0.0001	
Religion		
No religion/Other	18.40	374
Christian	21.50	7389
Muslim	20.50	1410
Traditionalist	26.20	233
	χ^2 (df) = 5.86 (3), P = 0.118	
Ethnicity		
Akan	19.80	4749
Ga/Dangme	20.40	754
Ewe	25.50	1312
Mole-Dagbani	21.00	1300
Other	24.00	1293
	χ^2 (df) = 26.47 (4), P < 0.0001	

Table 8 continued …

Indicator Variables	Has had STI	
	%	Number
Wealth quintile		
Poorest	22.50	1419
Poorer	19.50	1600
Middle	22.80	1995
Richer	23.30	2116
Richest	18.90	2275
	χ^2 (df) = 19.25 (2), P = 0.001	
Marital Status		
Never married	29.80	2151
Married	18.10	6656
Formerly Married	27.60	598
	χ^2 (df) = 146.44 (2), P < 0.0001	
Working Status		
Not working	28.40	1247
Working	20.30	8132
	χ^2 (df) = 41.91 (1), P < 0.0001	

Source: Computed from GDHS (2014).

4.2.2.4 Education and Sexually Transmitted Infection

From Table 8, we notice that as education increases, incidence of STI infection also increases. Nearly 23% of those with up to secondary education had had STIs as compared to 20.3% of those with no formal education. Nevertheless, we observe a high decline in incidence as educational level goes higher.

Educated individuals are able to gain information available through television, print or radio and are able to change their behavior or adopt precautionary measures to reduce risk of infection. For instance, with usage of condoms, educated people can read the blurb to get correct usage unlike uneducated people who cannot read. Also, education increases one's potential to earn higher income. The higher the level of education, the more one's income increases. Educated people can therefore afford to meet the costs that come with taking multiple sexual partners, thereby exposing them to sexually transmitted infections. This then

encourages them to engage in risky sexual behaviour. From Table 8, there was a significant association seen between education and STI acquisition (P < 0.0001).

4.2.2.5 Region of residence and Sexually Transmitted Infection

In reference to region of residence, we notice that nearly a third (29.8%) of the sample living in Brong-Ahafo had acquired an STI in the twelve months prior to the survey. This is followed by the Volta Region with a little over a quarter infection in the last 12 months. Ashanti region followed next at 21.2%, with Greater Accra following suit (21.2%) and Northern region following at 21.1%. Upper East recorded the lowest proportions of persons infected at 10.8 %. A chi-square test reveals a significant association between region of residence and STI infection (p-value< 0.0001) as shown in Table 8.

4.2.2.6 Type of Place of residence and Sexually Transmitted Infection

From Table 8, there is a significant association between place of residence and acquiring sexually transmitted infection. From the table, there is a high incidence of STI prevalence among urban dwellers compared to rural dwellers. Nearly 23% of urban dwellers have had STI infection compared with 19.8% of rural dwellers. The Chi-square test tells us of a significant association between place of residence and STI infection (p-value < 0.0001).

4.2.2.6 Religion and Sexually Transmitted Infection

Among the religious groups, 26% of traditionalists have had STI in the 12 months preceding the survey, followed by Christians with nearly 22%. People who belong to other religions or no religious groups recorded the lowest infection rates of 18.4 %. With a p-value greater than

0.05 (p=0.118), a chi-square test shows no significant association between religion and STI infection. The alternative hypothesis was therefore rejected, with the conclusion that there is no significant association between religion and STI (Table 8).

4.2.2.7 Ethnicity and Sexually Transmitted Infection

Culture influences people's behaviour regarding the do's and don'ts that govern a society. Majority of cultures in Ghana disapprove of deviant and risky sexual behaviours. In disapproving, some enforce strict measures in curtailing these behaviours while others are lenient. Rumor has it that other cultures in Ghana approve promiscuous sexual behaviour, for which people are allowed to sleep with other people during some festive occasions, without their spouses complaining. Due to urbanization and modernization these practices are no longer prevalent; but are nonetheless somewhat ingrained in the minds of members of those cultures. From Table 8, we see that a 26% infection rate was observed among Ewes, with people in the other category following closely at 24.4%. Akans recorded the least infection with nearly 20%. Ga-Adangbes recorded a 20.4% infection rate while Mole-Dagbanis showed a 21% prevalence. The chi square test of association proves a significant association between religion and STI ($p<0.0001$). The null hypothesis was therefore reject.

4.2.2.8.1 Wealth and Sexually Transmitted Infection

In every society, there would be people at each end of the wealth distribution (Harling et al., 2014). Inequalities in income have been associated with poor health outcomes (Dinkleman et al., 2008). The socio economic status of a person can influence his chances of acquiring an STI. For instance, as a result of economic deprivation a poor person may choose a partner who may be rich and have a higher risk of acquiring the infection. Also, an individual may be

at a higher risk of infection if they engage in risky sexual behaviour because they can afford to do so (Dinkleman et al., 2008). From Table 8, the group with the highest infection was Richer people (23.30%), followed closely by people in the Middle wealth quintile (22.80%) and Poorest people (22.5%). The smallest category of people to have STIs were the Richest people with 18.9%. A chi square test of association proves there is a significant association between wealth quintile and STIs (p-value = 0.001).

4.2.2.9 Marital Status and Sexually Transmitted Infection

Marital status has been identified as an influential factor in acquiring sexually transmitted infection. Literature has it that the time spent in marital unions is usually longer than time spent single (Bongaarts 2007). From the bivariate analyses, there is a significant association between marital status and having an STI. From Table 8, a low incidence of STI infection among married people is observed as compared to respondents in non-marital unions. Eighteen percent of married respondents had STI, nearly a third of never married individuals had had STI, and almost 28% of formerly married respondents had had STI in the 12 months preceding the survey. This high incidence among formerly married respondents could be attributed to the fact that most formerly married people are older and do not know much about safer sex practices such as using barrier methods such as condom usage (Idso, 2016). The low incidence of infection recorded among married couples could be as a result of fidelity in the union, as couples are supposed to stay faithful to each other. This notwithstanding, some infections are still recorded in marital unions. The chi-square test proved a significant association between marriage and sexually transmitted infections (p-value < 0.0001).

4.2.2.10 Working Status and Sexually Transmitted Infection

From Table 8, it can be observed that 28.4% of unemployed people had acquired STI in the last 12 months preceding the survey. In the same vein 20.3% of people who were working were observed to have acquired STIs.

4.3 MULTI-VARIATE ANALYSIS

4.3.1 Introduction

This section analyses all the selected variables, the dependent variable (sexually transmitted infection), independent variable (multiple sexual partnerships), intermediate variable (consistent condom usage) as well as the control variables. The dependent variable was a dichotomous categorical variable (success or failure). As such, a binary logistic regression was appropriate for the multi-variate analysis. The logistic model was used to tell the extent of influence of the selected demographic variables on sexually transmitted infections. There were two models, model 1 examined the relationship between multiple sexual partnerships and sexually transmitted infections, while model 2 examined the relationship between the mediating factors (multiple sexual partnerships and consistent usage of condom) while controlling for selected demographic variables on sexually transmitted infection. Age of respondent was put in categories. However, age at first sex was run as a continuous measure.

In the models, odds ratios were used to explain the relationships between the indicator variable and the outcome variable. Thus the exponent of the coefficient (B) represented the odds, a p-value indicated the significance level (p-value < 0.05), and the confidence interval depicted the range of values the odds ratio lay within. The reference category was labelled as RC in the analysis. An odds ratio of 1 represents an absence of a relationship, a value less

than 1 represents a less likelihood and an odds ratio greater than 1 represents a greater likelihood of acquiring sexually transmitted infections.

Table 9: A Binary Logistic Regression Model Showing the Relationship between Multiple Sexual Partnerships and Sexually Transmitted Infections

Indicator Variable	B	**OR , 95% CI**	**P - Value**
Multiple Sexual Partners			
1 (RC)	0	1	
'2	0.08	1.08 [0.88, 1.33]	0.447
3+	0.67	1.96 [1.33, 2.88]	0.001
Correct % prediction	78.6		
Nagelkerke R^2 (%)	0.2		
Model Chi square (df)	11.05 (2)		0.004
Constant	-1.32		<0.0001

Source: Computed from GDHS (2014)

The first model focuses solely on multiple sexual partners and sexually transmitted infections. From Table 9, we observe a significant relationship between multiple sexual partnerships and acquisition of sexually transmitted infections. As number of sexual partners increases, the likelihood of acquiring STI also increases. People who had 3+ sexual partners in the 12 months prior to the survey were 1.96 times as likely to be infected with STIs than people with only one sexual partner. There was no significant relationship between people who had 2 sexual partners and STI acquisition.

The model correctly predicts almost 78.6% of the responses. A Nagelkerke R^2 value shows that 0.2% of the variation in acquiring STI is explained by having multiple sexual partners. This implies other variables (demographic and socio-economic) can help explain the variations in the model better.

Looking at the model in Table 10, number of sexual partners (multiple sexual partnership) significantly predicts the likelihood of sexually transmitted infection acquisition. We notice as number of sexual partners increases that the odds of having STI also increases. Using people who had only one sexual partner as reference category, it was observed that people with two partners were 1.72 times as likely to have had STI. People who had 3 or more partners were four times [4.27] as likely to have had STI in the last 12 months preceding the survey. This confirms the first hypothesis that people who had more sexual partners had a greater chance of contracting STI than people who had only one sexual partner.

Table 10: A Binary Logistic Regression Model showing the Relationship between Multiple Sexual Partnerships, Condom use, selected background characteristics and Sexually Transmitted Infections

Indicator Variable	B	OR , 95% CI	P - Value
Multiple Sexual Partners			
1 (RC)	0	1	
'2	0.54	1.72 [1.27, 2.33]	<0.0001
3+	1.45	4.27 [2.65, 6.88]	<0.0001
Consistent Condom Use			
Stable union (RC)	0	1	
Yes	0.39	1.47 [0.93, 2.34]	0.103
No	0.43	1.53 [1.02, 2.3]	0.04
Sex of Respondent			
Female (RC)	0	1	
Male	-1.44	0.24 [0.2, 0.28]	<0.0001
Age at Sexual debut			
age at First Sex	-0.03	0.97 [0.96, 0.99]	0.003
Age Categories			
15-19	0.59	1.81 [1.4, 2.35]	<0.0001
20-29	0.72	2.06 [1.75, 2.43]	<0.0001
30-39	0.34	1.41 [1.2, 1.65]	<0.0001
40-49 (RC)	0	1	
Education			
No education (RC)	0	1	
Primary	0.11	1.12 [0.92, 1.36]	0.268
Secondary	0.23	1.26 [1.05, 1.51]	0.012
Higher	-0.22	0.81 [0.6, 1.07]	0.141

Table 10 continued …

Indicator Variable	B	OR , 95% CI	P - Value
Region			
Greater Accra (RC)	0	1	
Western	0.07	1.07 [0.85, 1.36]	0.564
Central	0.24	1.27 [1.02, 1.59]	0.036
Volta	0.44	1.55 [1.17, 2.07]	0.003
Eastern	0.01	1.01 [0.79, 1.3]	0.941
Ashanti	0.34	1.41 [1.14, 1.73]	0.001
Brong-Ahafo	0.83	2.3 [1.81, 2.91]	<0.0001
Northern	1.07	2.93 [2.18, 3.93]	<0.0001
Upper East	-0.41	0.67 [0.43, 1.03]	0.07
Upper West	0.28	1.32 [0.84, 2.08]	0.235
Type of Place of Residence			
Urban (RC)	0	1	
Rural	-0.24	0.79 [0.68, 0.91]	0.001
Religion			
No religion/Other (RC)	0	1	
Christian	0.	1. [0.75, 1.34]	0.991
Muslim	-0.13	0.88 [0.63, 1.22]	0.433
Traditionalist	0.29	1.34 [0.87, 2.06]	0.183
Ethnicity			
Akan (RC)	0	1	
Ga/Dangme	0.15	1.16 [0.93, 1.45]	0.18
Ewe	0.35	1.42 [1.17, 1.74]	<0.0001
Mole-Dagbani	0.13	1.14 [0.91, 1.42]	0.257
Other	0.17	1.19 [0.98, 1.45]	0.079

Table 10 continued.

Indicator Variable	B	OR , 95% CI	P - Value
Wealth quintile			
Poorest	0	1	
Poorer	-0.07	0.94 [0.76, 1.16]	0.537
Middle	0.07	1.07 [0.86, 1.34]	0.527
Richer	0.08	1.09 [0.85, 1.39]	0.507
Richest	-0.05	0.95 [0.72, 1.26]	0.736
Marital Status			
Never married (RC)	0	1	
Married	-0.1	0.91 [0.61, 1.36]	0.644
Formerly married	0.03	1.03 [0.82, 1.3]	0.8
Working status			
Not working	0	1	
Working	0.08	1.08 [0.93, 1.26]	0.322
Model 2 Summary			
Constant	-1.64		<0.0001
Correct % prediction	78.9		
Nagelkerke R2	14.50%		
Model Chi square (df)	920 (36)		<0.0001
H Lemeshow Chi square (df)	8.08 (8)		0.426

Source: Computed from GDHS (2014)

Using people in stable unions as a reference category, a significant association was found between non-consistent condom usage and STI acquisition (p=0.04). Respondents who did not use condoms consistently were 1.53 times as likely to acquire STIs. No significant association was found between consistent condom usage and chances of acquiring STI (p=0.103). With respect to sex of respondents, males were 76 % less likely to have acquired STI in the last twelve months compared with females. In addition, there was a significant association with age at first sex. From Table 10, we observe that a unit increase in age at first sex reduces the odds of acquiring STI by three percent.

Age of respondents had a significant association with acquisition of sexually transmitted infections. Using older people aged 40–49 years as reference category, respondents age 15–19 years were 1.81 times as likely to have had STIs. Those aged 20-29 years were twice as likely [2.06] to have had STI whereas 30-39 year olds were 1.41 times as likely to have STI. From table 10, we can observe that as age increases, the likelihood of acquiring an STI also reduces. However, people in the age group 20-29 (young adults) were more likely to have STI than any other group. Another predictor variable was Highest educational level. Contrary to expectation, using respondents with no formal education as a reference category, we observe from Table 10 that respondents with secondary education had the greatest [0.26 more] likelihood of acquiring STI. Respondents with primary education and those with higher education were not significantly different from those with no education with regards to the likelihood of having an STI.

There was a significant association between region of residence and STI acquisition. With Greater Accra as the reference, respondents in Western, Central, Volta, Eastern, Ashanti and Upper West were more likely to have STIs. Respondents in Brong-Ahafo were 2.3 times as likely to have had STI in the last 12 months. Respondents in the Northern Region were thrice as likely to have had STI in the last 12 months compare to people in Greater Accra. There is a lesser likelihood [33%] of infection for respondents in the Upper East region.

In addition to the above, type of place of residence had a significant association with STI. With urban dwellers as the reference category, rural dwellers were 21% less likely to have had STI infection in the last 12 months of the survey. With respect to ethnicity, there was a significant association with acquiring STI. Using Akans as a reference, Ewes were 1.4 times as likely to have had an STI acquisition in the last 12 months. Other ethnic groups were not significantly different from the reference. There was so no significant association with

Religion, Wealth quintile, Marital status, and working status of the respondents and the odds of having an STI.

From Table 10, model 2 correctly predicts almost 78.9% of the responses. In determining goodness of fit, a Hosmer and Lemeshow test significance of 0.426 being greater than > 0.05 indicates the model fits the data. A Nagelkerke R^2 value shows that 14.5% of the variation in acquiring STI is explained by all the variables. This gives a better prediction than only considering multiple sexual partnerships

4.4 Conclusion

The findings highlighted in this chapter show that several interesting associations exist between multiple sexual partnerships and sexually transmitted infections (STIs). The socio-demographic variable analysis shows that a considerable number of respondents (21%) had experienced one form of STI or the other (genital discharge or genital ulcer), while a relatively few (10%) had had more than one sexual partner in the 12 months preceding the study. Considering the fact that both multiple sexual partnerships and sexually transmitted infections are serious issues requiring attention, it is imperative that they be adequately addressed by health authorities in order to ensure their effects are properly managed. In so doing, they will be kept within reasonable limits and prevented from negatively impacting society beyond epidemic proportions.

CHAPTER FIVE

DISCUSSION

The chances of having an STI are a factor of behavioral, demographic and socio-economic variables that predisposes the individual to an infection. From our sample, one in five (21%) sexually active individuals had acquired an STI in the last twelve months prior to the survey.

Having more than one sexual partner, engaging in casual sex, commercial sex work or having sex with a promiscuous partner, greatly increases the likelihood of acquiring an STI, with the people most at risk being uninfected persons. From both models we observe that as number of sexual partners increases, the odds of having STI increases substantially. This result confirms the first hypothesis that people with multiple sexual partners are more likely to have STI than people who do not. The result from this study is consistent with studies done elsewhere (Simeon et al., 1996; Santelli et al., 1998; Exavery et al., 2011).

Non-use of barrier methods (condom) increases the risk of acquiring STIs (Ohene & Akoto, 2008). In this study, people who did not use condoms consistently had some higher odds of having STIs as compared to people who were in stable unions. No significant association was found between people who used condoms consistently and STI acquisition, which confirms the long acclaimed role of condom usage in reducing the acquisition and spread of sexually transmitted infections (Fatusi & Wang, 2009). To prevent the spread of STIs, condoms should be used effectively and consistently. From the model there was no significant association with respondents who use condoms consistently and acquiring STI which leads to rejection of the second hypothesis.

The fourth hypothesis that females are more likely to have sexually transmitted infections than males was confirmed. In this study, males are less likely to have STIs, and this is

consistent with other studies done by Hongjie et al., (2005) in China. Biological and social factors predispose females to higher risk of infection than males. The nature of the female reproductive organ, (biologically), makes it difficult for females to identify symptoms as easily as men would. For males, infections may be visible on the penis whereas the positioning of the vagina makes it difficult to easily detect symptoms. Females may also confuse symptoms of infections for something else (CDC, 2011). Social factors such as marriage and economic dependence on men in many African societies put women in a disadvantaged position to negotiate for safer sex with men. Low levels of education among females and low economic participation makes some women look for alternative sources of livelihood such as selling sex for survival (Odhiambo, 2012). Cultural norms approve of promiscuity among men, whereas women are to stay virgins till marriage. In some religious settings, a man can have more than one wife, but the same does not hold for women. Although women have their own games they play outside with the adage "it is only a woman who can tell the father of the child", males are mentioned as the bridge between contracting the infection from commercial sex workers and other high risk partners and infecting their spouses with it. Males report having more sexual activity, however, women suffer the long term effects of the infection.

Age of the individual was found to have a significant association with chances of acquiring STI. Older people are less likely to have STI compared to younger people. The group most at risk of infection are young adults (Fatusi & Wang, 2009). The sexual drive for individuals increases at certain ages and drops after some ages. Younger adults (20-29 years) are at a high risk of infection than older people. Older people may have a low sex drive as they may have other responsibilities to attend to unlike younger people who may not have such responsibilities. Also at certain ages, most people are married and the chances of being at risk is relatively lower as compared to younger unmarried people. Younger people have a pool of

sexual partners with the notion of knowing partners better in order to find a future prospect of a life time partner.

In addition, age at onset of sexual activity was found to have a significant association with sexually transmitted infection. Early onset of sexual activity predisposed the individual to a number of sexual partners before they get married, exposing young people to unwanted pregnancies and sexually transmitted infections (Awusabo-Asare et al., 2004). Younger people are characterized by little knowledge of safer sex practices (Fatusi & Wang, 2009) and are most likely to have sex with an already sexually experienced adult who may be a carrier of the infection, especially among females. In many Ghanaian communities, talking about sex is forbidden and as such people who do so are considered delinquents in the society. It is worth noting that sexual activity among the youth happens stealthily and under unconducive hygienic conditions, for fear of being caught and tagged delinquents in the community. Little or no safe sex practices happen in the context of sexual activity among young people (teenagers). More often than not young people are not married, will have a lot of sexual partners, often fall short on money, are most likely to use oral contraceptives to avoid pregnancy, may be embarrassed to seek treatment for infection and as a result, are more likely to infect their multiple partners (peers) thereby perpetuating the infection in that age group. A delay in age at first sex protects against contracting STIs (Ohene & Akoto, 2008).

Education is believed to have the greatest impact on prevention of risky sexual behaviours (Nyarko et al., 2014). Contrary to expectation, people with no formal education have a lower risk of infection as compared to people with education. From this study's results, it was observed that people with secondary education were more likely to have had STI in the last 12 months prior to the survey. Contrary to the finding, other studies found people at high risk of infection to be people with little or no education (Naidoo et al., 2014). Education has been thought of as the source of knowledge acquisition. Educated people can make sense of

information provided them on prevention of STI and can make informed choices in choosing a healthy sexual behaviour such as condom usage. On the other hand, education has also been associated with income: the more educated you are, the higher your income would be, and as such, people with higher education may be in the position to engage in risky behaviours as they have the funds to support such a lifestyle. A study in China found that being educated was associated with the risk of STI (Hongjie et al., 2005). In the case of this present study however, primary and tertiary education had no significant influence on STI prevention. Rather, secondary education had a significant impact on STI acquisition.

Also, this present study did not show a significant association between wealth and STI. This was contrary to expectation as it was thought that people with higher income could afford to support the lifestyle (costs) associated with having multiple sexual partners, whereas poorer people may not. For poor people, in the event that an STI is acquired, the whole family may have to sell their assets to pay for treatment of the STI, thereby perpetuating the cycle of poverty (CDC & World Bank, 2008). This knowledge would serve to make poor people to reduce their risky sexual behaviour.

In this study, region of residence was noticed to have an association with STI. People in the Central, Volta, Ashanti, Brong-Ahafo, and Northern Regions were most likely to have STI. Eastern Region had over the years been recognized as a high HIV prevalence zone. From the model, the Northern Region was observed to be thrice as likely to have STI in comparison to Greater Accra which is the most urbanized. In all, the Upper West Region recorded the least likelihood of having an infection among the 10 regions possibly as a result of the Navrongo Health Research Center which teaches fertility ideals, as well as safe sexual practices.

Similarly, a significant association was found between place of residence and STI. Contrary to the findings where more STI were in the rural areas than urban areas, people in urban areas

in this study were more likely to have had STI in the last 12 months preceding the survey compared to people in rural areas. Rural areas have been characterized by impoverished living (Dodoo et al., 2007), also with a lot of sexual activity often associated with low condom usage possibly as a result of limited recreational and primary health care facilities. In light of the limited facilities in the rural areas, infections are not treated even when reported and sometimes not with the correct medication. However, unlike urban areas, rural dwellings have not been greatly influenced by modernization and adoption of western culture. Rural areas have been associated with the extended family system and as such people do not have the liberty to engage in risky behaviours as compared to the urban areas. Also, the risk of infection could be a factor of the immediate environment of the individual and not the general population (Eames & Keeling, 2004). If one lives in a community where the prevalence of infection is high, the chances of infection is higher for the individual. For instance, in terms of partner choice, individuals living in a high prevalent community will most likely choose a partner who already has an infection or has had a history of the infection. Also dwelling on the social learning theory by Bandura, people learn behaviour based on their immediate environment. If they find everyone engaging in risky behaviour, they might as well engage in such behaviours since that is what society is doing.

In terms of ethnicity, only Ewes were found to be significantly more likely to have STIs compared to Akans in this study. Also, regarding marital status, no significant association was found between marital status and STI in this study. Consequently, one could get STI irrespective of marital status, going to show that marital union does not protect a person from STIs. With this said, we rejected the hypothesis that respondents in marital unions are less likely to acquire sexually transmitted infections than respondents who are not.

In conclusion, this discussion shows that findings of some studies concur with some findings of this present study. Similarly, parts of this study's findings diverge from findings of other

studies conducted elsewhere. The dynamics of multiple sexual partnerships and sexually transmitted infections are worthy of attention in the Ghanaian context. A harmonization of the findings and recommendations from this study and that of other available ones would lead to concerted global efforts in managing the negative effects of multiple sexual partnerships and sexually transmitted infections.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATION

6.1 Summary

The purpose of the study was to examine the extent to which multiple sexual partners predict an individual getting infected with sexually transmitted infection (STI). The data used for the study was the Ghana Demographic and Health Survey (GDHS) conducted in 2014. The sample was limited to individuals aged 15-49 years who had been sexually active within the 12 months prior to the study. In all there were 6696 females and 2710 males. Analysis was carried out at three levels: univariate, bivariate and multivariate analysis.

At the univariate level, it was found that among 9406 individuals, about one out of five (21%) sexually active individuals had had a symptom of a sexually transmitted infection in the 12 months of the survey. To examine the relationship between selected demographic and socio-economic variables, a chi-square was used to test the association for categorical variables while correlation was used to test for relationship in continuous variable at the bivariate level. At a significance level of 0.05, a significant association was observed between multiple sexual partners, age of respondent, age at first sex, education, region of residence, type of place of residence, ethnicity, and sexually transmitted infections. No association was however found to religion, marital status, wealth status and working status. Among people who had only one sexual partner, 21% had had STIs. Incidence of sexually transmitted infection was higher when number of sexual partner's increased. It was found that 22.3% and 35% of people with 2 and 3 or more sexual partners respectively had had STIs. It was also observed that 26% and 10% of females and males respectively had had STI in the last 12 months preceding the survey. A greater number of people aged 20-29 had had STI (28%). Interestingly, incidence of STI was higher among people with secondary education compared

to people with no formal education. In addition, Brong-Ahafo recorded the highest incidence of infection; nearly a third of sexually active people in the region had had an STI in the 12 months prior to the survey. With respect to correlation, there was a weak negative relationship between age at first sex and acquiring an STI.

At the multivariate level, two separate models were run. The first model consisted of multiple sexual partners and STI. The second model had multiple sexual partners and sexually transmitted infections, whiles controlling for selected demographic variables. The results in model 1 and model 2 showed a significant effect of multiple sexual partners and sexually transmitted infections. The finding supports the hypothesis that people with more than one sexual partner are more likely to have STIs than people who have only one sexual partner. Again, the hypothesis that females are more likely to have STIs than males was confirmed. Other demographic variables that were significant in the second model were age at first sex, age of respondent, education, region of residence, place of residence and ethnicity.

6.2 Conclusion

Multiple sexual partners (MSPs) are a major risk factor in the acquisition and spread of sexually transmitted infections (STIs) in Ghana. Factors like the sex, type of place of residence, age at first sex and region of residence dramatically intensify the exposure and risk of STIs within the Ghanaian context. The study's findings show that several important associations exist between multiple sexual partnerships and sexually transmitted infections (STIs). It is therefore imperative that the phenomenon of multiple sexual partnerships be adequately addressed in order to manage its effects in increasing the incidence of STIs. Ensuring Ghanaians adopt healthy sexual behaviours which promote the safety of themselves and their partners will ensure that negative outcomes like sexually transmitted infections

(STIs) are minimized to the barest minimum. For a global view of the connection between multiple sexual partnerships and sexually transmitted infections, other studies employing the same variables should be conducted elsewhere to paint a fuller picture of the phenomenon. Only then can real progress be made in mitigating the effects of sexually transmitted infections at the global level.

6.3 Recommendations

The following were suggested as recommendations based on the study's findings:

Public education on preventing sexually transmitted infections in Ghana should not only center on HIV/AIDS. Rather Ghanaians should be made aware of other forms of sexually transmitted infections. There should be sex education, especially among adolescents and young adults with particular emphasis on keeping one sexual partner since they are the group most likely to have series of sexual partners, and by extension be infected with STIs.

Ghanaian adolescents should be encouraged to delay age at sex debut. Delaying age at first sexual initiation till older age implies lesser likelihood of having multiple sexual partners and sexually transmitted infection. Young people and adolescents should be given sex education and taught to abstain from early sex. Abstinence should therefore be promoted as the best form of protection against sexually transmitted infections in Ghana.

Furthermore, it is recommended that enhanced STI education be given to Ghanaian females as they stand a higher chance of being infected with sexually transmitted infections. In addition, female sexual empowerment should be advocated and promoted. Women should be taught how to be assertive and negotiate for safer sex. Once they stand the risk of being disproportionately affected by the sexual escapades of their men, they should stand the

chance of insisting on safer sex in order to protect themselves. Male education should also be promoted to persuade men from engaging in multiple sexual partnerships. In the event that they decide to engage in such behaviours, they should be encouraged to practice safe sex.

Also, sex education in Ghana should be targeted at urban areas as well. As it seems, the strong social mores and norms prevailing in rural areas compared to urban ones serve as check on promiscuous sexual behaviour in rural areas. Looseness of these same norms implies urban dwellers are free to be promiscuous. Consequently, urban dwellers should be educated on the dangers of multiple sexual partnerships and STIs in order to prevent them from getting infected by the diseases.

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APPENDIX

Measures of Variables

Has had STI	Yes No
Multiple sexual partnerships	1 2 3+
Consistent condom usage	Stable union Yes No
Age at first sex	In completed years
Sex	Female Male
Age Categories	15 - 19 20 - 29 30 - 39 40 - 49
Highest Educational Level	No education Primary Secondary Higher
Region	Greater Accra Western Central Volta Eastern Ashanti Brong-Ahafo Northern Upper East Upper West
Type of Place of Residence	Urban Rural
Religion	No religion/Other Christian Muslim Traditionalist

Measures of variables continued

Ethnicity	Akan Ga/Dangme Ewe Mole-Dagbani Other
Wealth quintile	Poorest Poorer Middle Richer Richest
Marital Status	Never married Married Formerly married
Working Status	Not working Working