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EDUCATIONAL LEVEL AND HIV TESTING AMONG WOMEN IN GHANA

BY

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DECLARATION

Except for the specific references which have been duly acknowledged, I declare that this work is the result of my own effort, and it has not been submitted either in part or whole for any other degree in this University or elsewhere.

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DEDICATION

To my parents, Dr. Ebenezer Adu Ampong and Mrs. Maud Hansen Quartey, my siblings Benny Adu-Ampong, Dr. Ama Otuwaa Ampong and Charis Kwame Oduro Adu-Ampong

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ABSTRACT

Background: HIV testing and counselling are among the key ways for the prevention and management of HIV in Ghana. This is because people who test negative for the HIV antibodies receive education and information on ways to remain negative while those who test positive are given adherence counselling in order to prepare them to live healthier lives with the aid of the antiretroviral therapy. However, utilization of HIV testing and counselling services remains low among women.

Objective: The objective of this study was to explore the relationship between a woman's level of education and HIV testing in Ghana.

Methodology: The study employed secondary data from the 2014 Ghana Demographic and Health Survey. This is a nationally representative survey comprising a total number of 9,391 women within the ages of 15-49 in Ghana. Among the many aims of the survey was the need to generate current and reliable information on the educational level of women who had ever tested for HIV within their reproductive ages (15-49). Information generated includes knowledge about HIV, women who had ever tested for HIV, women's educational level. HIV testing uptake of women in their reproductive ages.

Results: Out of the 9,391 women who were surveyed, 53.5% of them had never tested for HIV throughout their lifetime. Of those who had ever tested for HIV, the highest proportion of them had secondary education (54.7%). Some of the factors that were found to be statistically significant determinants of HIV testing among women within the reproductive ages were

educational level, age, insurance availability, place of residence, marital status, recent sexual activity in the past 12 months, STI treatment and availability of insurance.

Conclusion: The finding that 54.7% of women surveyed had never tested for HIV is a serious public health concern. HIV sensitization activities that are geared towards increasing uptake of HIV testing services should emphasize on the benefits one derives from taking an HIV test and the fact that it is free within all public health facilities.

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CHAPTER ONE, BACKGROUND

1.1 Introduction

UNAIDS has recently proposed a set of three ambitious targets that, if achieved, are predicted to end the AIDS epidemic by 2030 (Staveteig et al., 2017). The targets known as the 90-90-90, call for 90% of people living with HIV (PLHIV) to know their status, 90% of PLHIV to receive antiretroviral therapy, and 90% of those on antiretroviral therapy to achieve viral suppression by the year 2020 (Granich et al., 2017).

This study focuses on the first of these targets, concentrating on Ghana, a country within sub-Saharan Africa. The African continent according to the World Health Organization (WHO) in 2016 estimated the African Region to be the most affected with one in every twenty-five adults (4.1%) living with HIV (WHO, 2016). Ghana has an HIV prevalence rate of 1.7% as at 2017 which portrays a low prevalence within the country (Gisslen et al., 2017).

In 2016, the joint United Nations Programme on HIV/AIDS (UNAIDS) estimated that about 1.9 million new HIV infections happened annually among individuals aged 15 and older. Out of the estimated 36.7 million people living with HIV (PLHIV) worldwide, 25.5 million are estimated to be living in sub-Saharan Africa. Globally, sub-Saharan Africa is the region hardest hit by the AIDS epidemic (Cohen et al., 2017). Deaths among adolescents living with HIV have increased since 1990, and HIV/AIDS is among the leading causes of death in adolescents living in sub-Saharan Africa (Gore et al., 2011).

In a report published by the Unites Nations Children's Fund in 2004 stated that education, particularly for girls, is fundamental to reversing the spread of HIV/AIDS. Educated young

women are more likely to know what HIV is and how to avoid infection, because they are more likely to have the attitudes and skills that enable them to resist pressure and take responsibility for their own lives. They are more likely to utilize their knowledge and skills to make healthy choices, including protecting themselves from HIV. (UNICEF, 2004)

Globally there has been a growing commitment to ending the AIDS epidemic which has led to the establishment of the 90-90-90 targets by UNAIDS in 2014. UNAIDS predicts that reaching these targets by 2020 will enable the world end the AIDS epidemic by 2030, creating profound health and economic benefits (UNAIDS, 2014).

Seeking early treatment for HIV and AIDS is crucial to the reduction in the incidence and spread of the epidemic. This has led to the emergence of the test and treat paradigm which has received massive support among researchers and policy makers alike. In this regard, the Ghana AIDS Commission (GAC), like many other AIDS control institutions, has made HIV testing and counselling a major policy focus. While the importance of such policies cannot be over emphasized, HIV testing and counselling services play an integral role in the fight against HIV as it provides an avenue for persons to be able to receive the preventive information which is part of the HIV testing process (Gisslen et al., 2017).

The provision of HIV Testing and Counseling (HTC) is a very significant part of any national HIV prevention programme. HIV testing is an essential gateway to HIV prevention, treatment, care and support services (Cohen et al., 2017). Many studies have reported that HTC plays a vital role in identifying persons infected, as well as providing an opportunity for them to benefit from therapeutic interventions.

HIV testing coverage has made notable progress over the past decade. In Africa, the proportion of people living with HIV who are aware of their HIV status grew from an estimated 10% in 2005 to 55% in 2015 (World Health Organization, 2016). This achievement becomes more significant considering that individuals who know their status are less likely to engage in HIV related risk behaviors (Staveteig, 2017). Following an HIV positive diagnosis, an individual has the avenue to have early initiation on ART, as recommended by the World Health Organization (WHO), which can lead to suppressed viral load, thereby reducing the risk of HIV transmission and the progression to AIDS (UNAIDS, 2014).

However, HIV testing access and uptake is not uniform across countries or communities in sub-Saharan Africa, and substantial gaps in coverage remain. While recent estimates report that 77% of all people diagnosed with HIV are on Anti-Retroviral Therapy, 40% of all people with HIV remain undiagnosed (World Health Organization, 2016). Although the number of annual HIV tests has increased, many people at risk remain unreached by testing (World Health Organization, 2016).

1.2 Statement of the Problem

Ghana as a member of the United Nations must scale up efforts in locating, testing, treating and retaining in treatment persons living with HIV in their bid to end AIDS by 2030. This therefore requires that a clear majority of the population in the country test and know their HIV status to start treatment as soon as possible to reduce the likelihood of developing to the AIDS stage. This however is not the case in Ghana as only 45% of the total population living with HIV know their HIV status (Gisslen et al., 2017). UNAIDS estimates about 290,000 persons to be living with HIV in Ghana and out of this number 130,000 know their HIV status which means that only 45%

of Ghanaians living with HIV know their status instead of the 90% target set by UNAIDS in 2014 (Gisslen et al., 2017). This therefore requires a scale up of efforts geared towards HIV testing within the country to reach out to the 55% of the population living with HIV who do not know their status. Education remains one of the surest ways to bridge the gap between the untested population living with HIV as an educated woman is more likely to opt in for an HIV test as compared to an uneducated woman.

1.3 Research Questions

The study seeks to answer the following questions

i. What are the disparities in HIV testing relative to educational attainment in Ghana?

ii. What are the differences in HIV testing among the different age groups in Ghana?

iii. Does having an insurance cover influence one's decision to test for HIV in Ghana?

1.4 Research Objectives

The general objective of this study is to explore the relationship between a woman's level of education and HIV testing in Ghana whiles the specific objectives are;

i. To examine the effect of educational attainment on HIV testing in Ghana

ii. To explore the differences in HIV testing behavior of women among the different age groups in Ghana

iii. To examine the effect of health insurance coverage on HIV testing in Ghana

1.5 Rationale

HIV testing is an essential part of identifying persons living with HIV and key to prevention of HIV transmission. For persons who test HIV positive, testing is the starting point for care and management of the virus. It also serves as the beginning of efforts to prevent infection of their sexual partners and their children or people within their household as they are provided with education on mode of HIV transmission during the testing process. Even for people who test HIV negative, the testing process is an opportunity for counseling about HIV transmission that may strengthen prevention efforts and reduce stigma of persons living with the virus.

Access to HIV testing is considered as a cornerstone to the strategic framework adopted by Ghana for HIV control. As a result, the Government of Ghana has since introduced and implemented various programmes to increase testing. Notwithstanding these interventions, HIV testing uptake is still low and unknown to many Ghanaians (Koku, 2011), this is so due to the fear of the testing outcome and HIV related stigma (Ulasi, et al., 2009). There is also very little knowledge on educational level and HIV testing and counselling in Ghana.

This study is therefore looking at identifying possible reasons for the low testing rates of HIV especially among women and find possible solutions to these reasons identified.

This study will also add on to the already existing literature on educational level and HIV testing and counselling services among women in Ghana.

It will also help know the needs of women within the different age groups in order to help design programs to suit their specific needs in relation to HIV testing.

1.6 Hypotheses

i. Women with higher level of education are more likely to have ever been tested for HIV than women with no education.

ii. Women who are between the ages of 30-34 are more likely to have ever been tested for HIV than those between the ages of 15-19

iii. Married women are more likely to have ever tested for HIV than single women

iv. Women in urban areas are more likely to have ever tested for HIV than women in rural areas

CHAPTER TWO, LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature on previous studies conducted on educational level and HIV testing and counselling. The role of education in health, proportion of HIV testing and counselling service utilization, level of education and HIV/AIDS, factors associated with uptake of HIV testing and counseling services were reviewed.

2.2 Education and health

Formal education has been called a "social vaccine," as greater school attendance is related to longer life expectancy, fewer offsprings, and fewer negative health outcomes, even when controlling for socioeconomic status and other demographics (e.g., Baker et al., 2008; de Walque et al., 2005). These effects can be seen even after relatively little formal schooling. Just how school attendance produces such a wide range of effects is not well understood. One possibility is that education confers on the individual knowledge about general health and health risks. However, research suggests that knowledge alone is not sufficient to produce the range of effects associated with formal education. For example, approximately $750 million in U.S. federal money is spent each year on the Drug Abuse Resistance Education (D.A.R.E.) program to increase basic knowledge (defined as a superficial knowledge of the facts) about alcohol, smoking, and drugs (Peters et al., 2010). Although the program is intended to curtail risky behavior in adolescents, studies suggest that the program has no significant influence on drug-use behaviors as has been found by Weiss, C. H., Murphy-Graham, E., & Birkeland, S. (2005). Basic knowledge about health risks may therefore be a necessary but insufficient condition for making better health-related decisions (Baker et al., 2008).

Another explanation for the beneficial health effects of formal schooling is that education may "teach one to think," imparting one with cognitive and decision-making abilities that are responsible for improving one's health (Lleras-Muney, 2005). Evidence suggests that formal education relates to increases in domain-general cognitive processes (i.e., working memory, inhibitory control, and attention-shifting processes), and general intelligence (Ceci, 1991; Nisbett, 2009). For example, schooling is associated with increases in intelligence quotient (IQ) that are three to four times higher than the IQ increases associated with maturation (Cliffordson & Gustafsson, 2008).

Neuroimaging studies suggest that numeracy education (improving numerical ability) may also exercise and enhance other cognitive abilities (Eslinger et al., 2009). Greater cognitive abilities and higher numeracy have both been linked to better decision making (Peters et al., 2010; Stanovich & West, 2000), and some studies have related both (particularly numeracy) to better health behaviors and outcomes. Goldman and Smith (2002) for example, found that scores on the Wechsler Adult Intelligence Test explained the correlation between higher education and greater adherence by diabetic and HIV positive patients to treatment recommendations. Furthermore, lower levels of numeracy were associated with health disparities, self-reported poor health, higher body mass index, poor health knowledge and disease self-management skills, and a tendency to choose lower-quality health options. These associations appear to be the result of less numerate individuals being less able to understand the cognitive and effective meaning of numeric information (Lipkus & Peters, 2009; Reyna, Nelson, Han, & Dieckmann, 2009).

It is important to point out that education not only affects changes in sexual behavior, but also predicts level of knowledge about the disease. A study based on data from the 1998–1999 National Family Health Survey (NFHS) of India found that, the higher the level of education of

women, the more likely it is that they will have greater awareness of and accurate knowledge on AIDS. Another significant result from this analysis was the importance of informal learning in rural areas: women's knowledge of AIDS depended on interaction with people of equal or higher education levels (Aggarwal, 2004).

2.3 Level of Education and HIV testing

Education plays a significant role in the adherence to an overall healthy lifestyle. Researchers often take into account an individual's education level and how education impacts one's risk for contracting diseases. Researchers have shown that low literacy has a strong tie to multiple adverse health outcomes (Lee et al., 2004). Applying this idea about health behavior, outcomes and education level to HIV testing is more difficult, however increasing HIV testing in individuals remains a mutli-factorial issue. Stigma, education, and age all play a part in increasing the rates of testing each year.

On the basis of an individual, education places on such persons a better position to understand information on HIV and AIDS transmission and prevention; better access to health services, reduced social and economic vulnerability, and higher level of participation in programmes dealing with HIV and AIDS public education.

There is evidence to show that the more education one has, the less vulnerable and the more likely he/she is to the practice of safer sex. For example, girls with high school education are less likely to contract HIV/AIDS than those who have had lower level of education (Mwamwenda, T. S. 2014). The World Bank takes the position that, against the background of AIDS being incurable, education may well be the alternative to vaccines available to mankind. In Botswana, Fako et al. (2010) made a study of 1,294 primary to university students on their knowledge and

testing habits about HIV and AIDS, driven by the motivation that education is one of the factors predicting one's knowledge of HIV and AIDS and testing behavior. The results of the study confirmed what had been hypothesised. Those with higher level of education were more knowledgeable and more likely to have tested for HIV than those who had lower level of education; university students out-performed secondary school students. Quality of education also served as a predictor of one's knowledge and testing habits of HIV and AIDS.

Larson et al., 2006 in Bangladesh investigated adolescents' knowledge and awareness about HIV tests. By use of a multivariate logistic regression analysis they concluded that, the number of years of schooling correlated with their HIV testing behavior (Mwamwenda, T. S. 2014). He further pointed out that there was a correlation between educational attainment and the chances of being tested for HIV, in such a way that, the higher the education level attained, the higher the chance of being tested for HIV (Mwamwenda, T. S. 2014). Girls who stay in school at both primary and secondary school contribute to lower chances of their being tested for HIV. They conclude that merely being in school, as well as higher educational attainment are each sufficient to predict HIV testing behavior (Mwamwenda, T. S. 2014).

According to Baker et al. (2008), there are many research findings showing that, higher education level is associated with lower level of HIV/AIDS risk taking. In an extensive investigation on 19,000 adults' education effect on the use of condom, observed that for every additional year in their education, there was a linear correlation increase in their use of condom. It was further argued that schooling enhances higher level of cognitive skills, in terms of both planning and reasoning. Such abilities contribute to better decision making, regarding the use of HIV/AIDS preventive measures which include HIV testing. It was further argued that HIV/AIDS

testing leads to improvement of attitude towards people who are infected, which comes about as a result of exposure to education.

United Nations International Children Education Fund, (UNICEF) 2004 reports that representative surveys in 53 countries have shown that, education particularly geared at girls has the potential to equip young people with the necessary HIV/AIDS knowledge, that facilitates them in the prevention of transmission of HIV/AIDS infection by first knowing their HIV status through testing. Comparative analyses of countries and regions have shown concrete evidence that, both young men and women with higher levels of education command higher levels of HIV/AIDS knowledge; better understanding of prevention of infection, undergoing HIV testing, undergoing change of behaving that is likely to predispose them to contracting HIV/AIDS. It goes without saying that, quality education for children will lead to the protection of people threatened with the most dreadful disease in recent human history. According to Carol Bellamy, a UNICEF Executive Director, “Education is crucial to success against the pandemic. In fact, UNICEF remains convinced that until an effective remedy is found, education is one of the most effective tools for curbing HIV/AIDS” (Mwamwenda, T. S. 2014).

A nationwide survey of 2,057 respondents in Afghanistan was carried out aimed at investigating their level of HIV/AIDS tests, knowledge/awareness (Miriti, N. K. 2019). The results showed that the majority of them were not that well informed about HIV/AIDS and had never taken the HIV test. For the few that did well in their response to the survey, education and access to media played a significant role in heightening their HIV/AIDS knowledge, awareness and testing rates. The level of education for the participants contributed immensely to their knowledge/awareness and testing for HIV/AIDS.

Hossan, (2018) assessed ever married women's testing habits, knowledge and awareness regarding HIV/AIDS and some of the factors associated with such knowledge in terms of both control and prevention. The sample consisted of 10,996 women whose ages ranged between 15 to 49 years. The results showed that, among other factors, participants' education and that of their husbands had statistically significant correlation with their HIV testing habits. In a related investigation, De Walque (2005) investigated the effect of education campaign on knowledgeability about HIV/AIDS over a period of twelve years in Uganda. This was followed by what the de Walque refers to as "substantial revolution" in the HIV and AIDS education. The campaign resulted in less and less women contracting HIV in the rural areas, which were the focus of the study. In terms of use of condom, it was correlated with the level of schooling participants had attained (De Walque, 2005). Galvez, (2012) in Peru examined the protective attitudes and practices against the risk of HIV and AIDS among Peruvian students selected from fifty-two schools. In comparison a correlation between age, education and knowledge, attitudes and practices such as taking the HIV test, statistically significant correlations were observed.

Evidence from studies examining the association between educational attainment and HIV infection is mixed. Although earlier studies among sub-Saharan African populations showed higher HIV prevalence among more educated individuals (Fylkesnes et al., 2001; Grosskurth et al., 1995; Senkoro et al., 2000; Taha et al., 1998). A more recent review of the literature (Hargreaves & Glynn, 2002) suggests either a weakening or reversal of that association.

Findings from a cohort study in rural Uganda showed a significant association between higher educational attainment and lower rates of HIV testing among young women, compared with no significant association in the same demographic group 11 years earlier (De Walque et al., 2005). In western Uganda, surveillance data revealed significantly decreased HIV rates among primary

and secondary-educated women following HIV-related interventions, but no corresponding decline among illiterate women (Kilian et al., 1999). Education may influence an individual's risk perception for HIV infection directly by providing exposure or access to prevention messages, testing facilities or indirectly by facilitating employment opportunities and income.

Studies by Hutchinson & Mahlalela, (2006); Say & Raine, (2007) and Kiwanuka et al., (2008) shows that Secondary or higher education was found to be associated with higher likelihood of having had HIV testing and counselling. This is in line with a common observation that individuals with higher education levels tend to use more health care services as compared to those with low or no formal education (Kiwanuka et al., 2008).

Ziraba et al., (2011) also found in their study of the determinants for HIV testing and counselling in Nairobi's urban informal settlements that low HIV/AIDS-related knowledge (education) was associated with lower usage of HIV testing and counselling services.

While the positive correlation between level of education and accurate HIV/AIDS testing is significant, research by De Walque (2005) shows that the role of education in reducing HIV prevalence among young adults cannot necessarily be attributed to exposure to HIV prevention classes. De Walque's 2005 research on Ugandan 18-29 year olds shows that most would have left school by the time school-based HIV prevention classes began in 1996. Thus, it appears that general schooling, not these classes, is what makes the most profound impact on young people's sexual behaviour. Despite such evidence, accurate HIV/AIDS education and testing remains an important and effective component of the comprehensive strategy to protect individuals against infection.

2.4 Factors Associated with Uptake of HIV Testing and Counseling Services

The factors that influence uptake of HIV Testing and Counselling are varied and can be categorized under socio-demographic factors, personal-related factors, knowledge regarding testing and health system-related factors as shown below.

2.4.1 Socio-demographic factors influencing HIV testing

A study conducted by Kaai, Bullock, Burchell, & Major (2012) on factors that affect HIV testing and counseling services among heterosexuals in Canada and the United Kingdom found age to be the most frequently mentioned socio-demographic factor associated with HIV Testing and Counseling (HTC). The study further indicated that there was a difference in the direction of the association. The difference was found in comparing three studies where it was reported that HTC was more likely if respondents were younger than 40–45 years, while other three studies found that respondents who were younger than 25 years or 30 years were less likely to have been tested for HIV. The difference the study indicated was mainly due to the samples that were studied. They identified the first group of studies sampled as younger populations compared to the last three studies that focused on older populations. In both situations however, the results were reported to suggest that the highest testing rates were among the middle-aged study participants and lower among the young and older populations.

A survey conducted by the Kenyan national bureau of statistics in 2003 found that 13.1% of women and 14.3% of men in Kenya had been tested at the time of the survey, while the most recent national survey showed that 56.5% of women and 39.9% of men had ever been tested and received results (Ziraba et al., 2011). The apparently widening gap for HIV testing and counselling between women and men might be due to increased testing among women in

prevention of mother to child transmission (PMTCT) programs (Ziraba et al., 2011). It is also not clear whether the very low levels of HIV testing and counselling among men is mainly an issue of women having more contact with the health care system or men are more likely to opt out of provider initiated testing and counselling when it is offered. It was reported in the study by Ziraba et al., (2011) that although the percentage of females (58%) that tested slightly superseded that of males (54%), results of HIV testing across gender are insignificant.

A study conducted by Abokyi et al., (2014) in Kintampo found education to be the strongest predictor of willingness to test for HIV as respondents with primary education were more likely to want to get tested than those with no education. This was also the case in a study conducted by Asante (2013) among private university students in Accra. He found that students had a good to excellent knowledge about HIV/AIDS and an average of 7.77 had ever tested for HIV. Addis et al., (2013) examined knowledge, attitude and practice towards voluntary counseling and testing among university students in Northwest Ethiopia and found an association between higher educational status, being employed and having better income and uptake of HIV testing. Many other literature have shown that those with higher education were more likely to report having tested for HIV as compared to the less educated. Kalanzi's (2013) study revealed that 63% of those with some college education had tested for HIV, compared to 47% of those with a high school education having tested for HIV. This was attributed to the potential of education to empower individuals with more financial ability to access testing services and also knowledge regarding the importance of disease prevention and control.

A study by Galletly et al., (2019), found other demographic factors such as ethnicity, residing or living in a city of over one million people, having low income, being a female and being more educated to have influenced the heterosexuals in getting tested for HIV. Marital status was also

an important determinant of HIV testing in a study of the determinants of HIV testing and counselling in Nairobi among informal settlers by Ziraba et al. (2011). Not only can an HIV-positive result lead to divorce or separation (Porter et al., 2004), the death of a spouse from suspected AIDS may motivate the surviving spouse to seek HIV testing (Ziraba et al., 2011). This might explain the finding observed in this study that divorced/separated/widowed individuals were more likely to have had client initiated testing and counselling (CITC) compared to married individuals. The finding that CITC among married individuals was low might be related to the false notion that people in stable marital partnerships are at a lower risk of contracting HIV yet recent evidence suggests that most new infections are taking place among married individuals who were previously thought to be a low risk group (Gelmon, 2009; Khobotlo et al., 2009). The significantly lower likelihood of the never married women having had Provider initiated testing and counselling (PITC) might be a reflection of their limited contact with the health care system as compared to their married counterparts who mainly make contact for obstetric reasons. Addis et al., (2013) also reported in their study conducted among university students in North west Ethiopia that large proportion of the students who were single (59%) were more likely to have taken an HIV test than those “in-relationship” (25%) and married (16%). The study further reported a greater proportion of never married students (66%) as likely to test for HIV in the future as compared to those “in relationship” (27%) or married (7%) students. The results of the study revealed an association between knowing where to get tested and taking an HIV test.

Poverty was also found to be associated with HIV testing and counseling behavior just as it has been shown in health seeking behavioral studies. In a study conducted in Nigeria by Bwambale, et al., (2008) poverty was found to be a big barrier for seeking health care from professionals.

Kalanzi, (2013) found that urban settlers were more likely to have tested (60%) compared to 46% rural settlers. The association between geographical location and testing for HIV was again found to be highly significant by the study. The study however, attributed the association to accessibility in terms of proximity to testing facilities just as health seeking behavioral studies have reported.

2.4.2 Personal-Related Factors Influencing Uptake of HIV Testing Counselling

HIV Testing and Counselling is the process by which an individual undergoes counselling that will enable him or her to make an informed choice about being tested for HIV. This decision to get tested must be entirely the choice of the individual with confidentiality assured. HTC has been found effective in facilitating behavioral change to both prevent HIV as well as getting access to early care and support. HTC play a major role in bringing about behavioral change, reducing unprotected sex and helping reduce the incidence of HIV and other Sexually Transmitted Infections (STIs) (Addis et al., 2013).

According to Kalichman, Eaton & Cherry (2011), fact-based education about HIV transmission is necessary, but not sufficient for promoting HIV testing. Knowledge about HIV/AIDS and HTC utilization has positive association. Students who have knowledge about HIV were 3.69 times more likely to utilize HTC service as compared to those who did not have knowledge about HIV.

Moreover, knowledge about HIV, knowledge about HTC and attitude towards HTC showed association with practice of HTC for HIV which indicates the relation of one with the other. Hence, working on the knowledge and attitude change will facilitate the uptake of HTC service (Addis et al., 2013).

Gadegbeku & Saka (2013) in their study regarding attitude of the youth towards HTC for HIV and AIDS in Accra reported that despite the fact that HTC services have numerous advantages, acceptance of this service in many countries (including Ghana) especially where HIV is highly stigmatized and access to these services and support for people who test sero-positive or HIV infected individuals is limited. The study further revealed that although 95% of respondents knew their sero-status could be checked, only 37% had actually heard about availability of HTC services. Out of the 37% who were aware of this service, few (6%) had actually been to the HTC centre either to visit a friend (2%) or to check their status (4%). This suggests the level of awareness and use of this service by the studied youth was low.

According to Kaai et al. (2012), study participants who have adequate knowledge on HTC are more likely to have been tested for HIV compared to those with limited knowledge. Additionally, the study reported that several studies reviewed showed that respondents got tested for HIV because they wanted to begin new sexual relationships or just out of curiosity

Kaai et al.'s, (2012) study on factors that affect HIV Testing and Counseling and testing among heterosexuals in Canada and the United Kingdom, reported that several personal-related factors were found to be associated with HTC. The study categorized these factors into six broad categories as follows: risk perception, illness or having HIV symptoms, fear of HIV-related stigma and other fears, level of HTC education, mandatory or partner recommended HTC, and culture. The study found risk perception as the most commonly cited personal-related factor playing the roles of both a facilitator and barrier of HTC. This was reported to have been cited in 70% of 77 studies reviewed during their study. Kaai et al., (2012) also found perceived risk as the strongest predictor of HIV testing and counselling using the model of health care utilization.

According to Strauss et al., (2015) at the level of the individual, one fundamental finding that influences uptake of HTC is the importance of knowledge about testing and HIV. The study further explained that lack of knowledge can be an important barrier to HIV testing. The potential of a person's behaviour affecting their belief and intention to test for HIV was also carefully established in the study. They added that people who perceived themselves as high risk because of unhealthy sexual behaviours and suspecting that they may be positive were likely to undertake HIV test. Again, the study explained that students who have never engaged in sexual activity and hence believed they are not infected by HIV are less likely to take HIV test. The study also identified fear of HIV-related stigma and discrimination as significant barriers to uptake of HTC.

Concerns regarding confidentiality were also linked to stigmatization. Direct trust relating to health workers providing HIV testing and counselling services was a significant determinant of uptake of HTC. Also, the challenge of travel hours, long queues and limited opening hours of health facilities especially affects students' ability to access HTC services because students may have to miss classes in order to undergo the test. The cost of HTC was found to be a significant determinant of HIV testing especially among students. The study by Strauss et al. (2015) revealed that offering HTC free of charge as well as conducting mobile HTC services significantly facilitate young people's demand for HIV testing.

In another study that was reported by Kaai et al., (2012) where the researchers evaluated factors associated with HIV testing and counselling among heterosexual black Africans aged 16–44 years living in Britain, it was found that increased perception of risk was significantly associated with HIV testing and counselling.

Cultural background was also found to affect peoples' beliefs and attitudes on prevention, leading to under-utilization of HTC as demonstrated in 19% of the studies reviewed in their paper on Factors that affect HIV testing and counseling services among heterosexuals in Canada and the United Kingdom. The study found for instance in a qualitative study among Canadian Aboriginal women that cultural norms about not disclosing any problems, including sexual issues, to outsiders (e.g., health providers) as key barriers to testing for HIV (Kaai et al., 2012) .

Kaai et al., (2012) found that HIV/AIDS related stigma was strongly and inversely associated with HTC utilization. Stigma was found to have significant effects on health and HIV transmission by influencing persons to delay care seeking and also failure to disclose health conditions due to fear of being isolated or rejected, and may subsequently result in non-adherence to medical advice. According to Kaai et al., (2012), Stigma and discrimination have taken their toll in Ethiopia not only at the work place, in housing, health facilities, schools, and family and personal relations but also in medical services, discouraging people from being tested for HIV. A related study conducted in 2006 in South Africa by Emlet (2006) was cited to have found low stigma among urban adults with better education and those with higher economic status. Emlet (2006) reported that in rural areas with smaller communities and less anonymity, there may be fear about compromised confidentiality, which will eventually increase stigmatization from a positive test. The difference in HTC utilization between urban and rural areas was purportedly attributed to the perceived differences in access to health care facilities where HIV testing and HIV/AIDS-related information are provided (Leta et al., 2012).

In a study where Addis et al., (2013) assessed knowledge, attitudes and practice towards voluntary counseling and testing for HIV among university students in Ethiopia, they found that the main reason for persons who had never had HIV testing and counselling in the past was fear

of positive result and stigma and discrimination following the result. Addis et al., (2013) therefore stressed on the need for more work in creation of awareness regarding stigma and discrimination and the possibility to live longer with the virus as far as HIV positive individuals lead their lives as per physicians and counselor's recommendations.

A study by Asante (2013) among university students in Ghana found that over 90% of the students had knowledge about where to get an HIV test. However, only 45% had had a test for HIV. The resistance of students to access HIV test was attributed to fear, anxiety and stigma as well as discrimination associated with the counseling and testing and AIDS respectively (Asante, 2013). The study reported that fear of stigma has shown to influence the youth not to practise preventive behaviours and an increase in knowledge about HIV does not predict behavioural change (Asante, 2013). The study also reported that over 90% of the subjects were not married (single and "in relationship") which is of health concerns because 39% and 56% of female and male students respectively showed some interest in testing for HIV in the future (Asante, 2013). Despite the fact that knowing where to test for HIV significantly increased the likelihood of getting tested, it does not necessarily influence people's desire to get tested in the future. The study reported that unavailability of HIV Testing and Counseling facilities on various public and private university campuses in Ghana could be a possible factor for the current behavioural trend (Asante, 2013).

2.4.3 Health System-Related Factors Influencing Uptake of HIV Testing and Counselling

Kaai et al. (2012) reported in their study that obtaining HTC as part of a physical check-up (e.g., integrating HIV testing with other services occurring in sexual health clinics or hospitals) or routine prenatal HIV screening during a past pregnancy (men referred to spouse's pregnancy)

was the most commonly reported system-related facilitator in 33% of the studies that were reviewed. Respondents as reported in the study cited lack of anonymity and unsuitable testing (e.g., inaccessible, inconvenient and not private) venues as barriers to HTC uptake in 30% of the studies.

Accordingly, several of these studies reviewed reported that study participants mostly from small communities avoided STI clinics because they are afraid their neighbours may see them and reveal their risk behavior to others (Kaai et al., 2012). Kaai et al. (2012) also found similar studies emphasizing mistrust of the health care services by Aboriginal populations due to past colonial negative experiences, and difficulties that newcomers face as they visited the health care system.

According to the findings of a cross-sectional survey conducted by Leta et al. (2012) on factors affecting voluntary HIV counseling and testing among men in Ethiopia, studies from Sub-Saharan Africa have documented that uptake of HTC increases when provided under home-based and work place-based compared to clinic-based HTC. This shows that there are some hindrances of facility-related HTC use.

Tsegay et al. (2013) in their study to assess voluntary counseling and testing services among Debre Markos University students in Ethiopia identified the availability of ART as a positive predictor of HIV testing and counselling (HTC) acceptance. They reported that students who are aware that ART will be available in the HTC site were 3.12 times more likely to utilize HTC services as opposed to their counterparts who are not aware of the availability of ART in the HTC site. The study further reported that the provision of ART will significantly prolong the lives of students who were infected and eventually motivate the students to create positive

attitude and acceptance towards HTC services. Evidence from the study revealed that increasing availability of ART will lead to increase in HTC acceptance by the students because students, who perceive risks associated with the HIV/AIDS test results were 2.4 times more likely to utilize HTC service as opposed to their counterparts (Tsegay et al., 2013).

The available literature focuses on HIV testing and counselling services for both men and women and does not really examine the role an increase in the uptake of HIV services among women can contribute in reversing the increasing number of HIV cases identified. The available literature also does not consider the effect increase in HIV testing uptake among women can have on the overall HIV testing rates in the country.

2.5 Analytical Framework

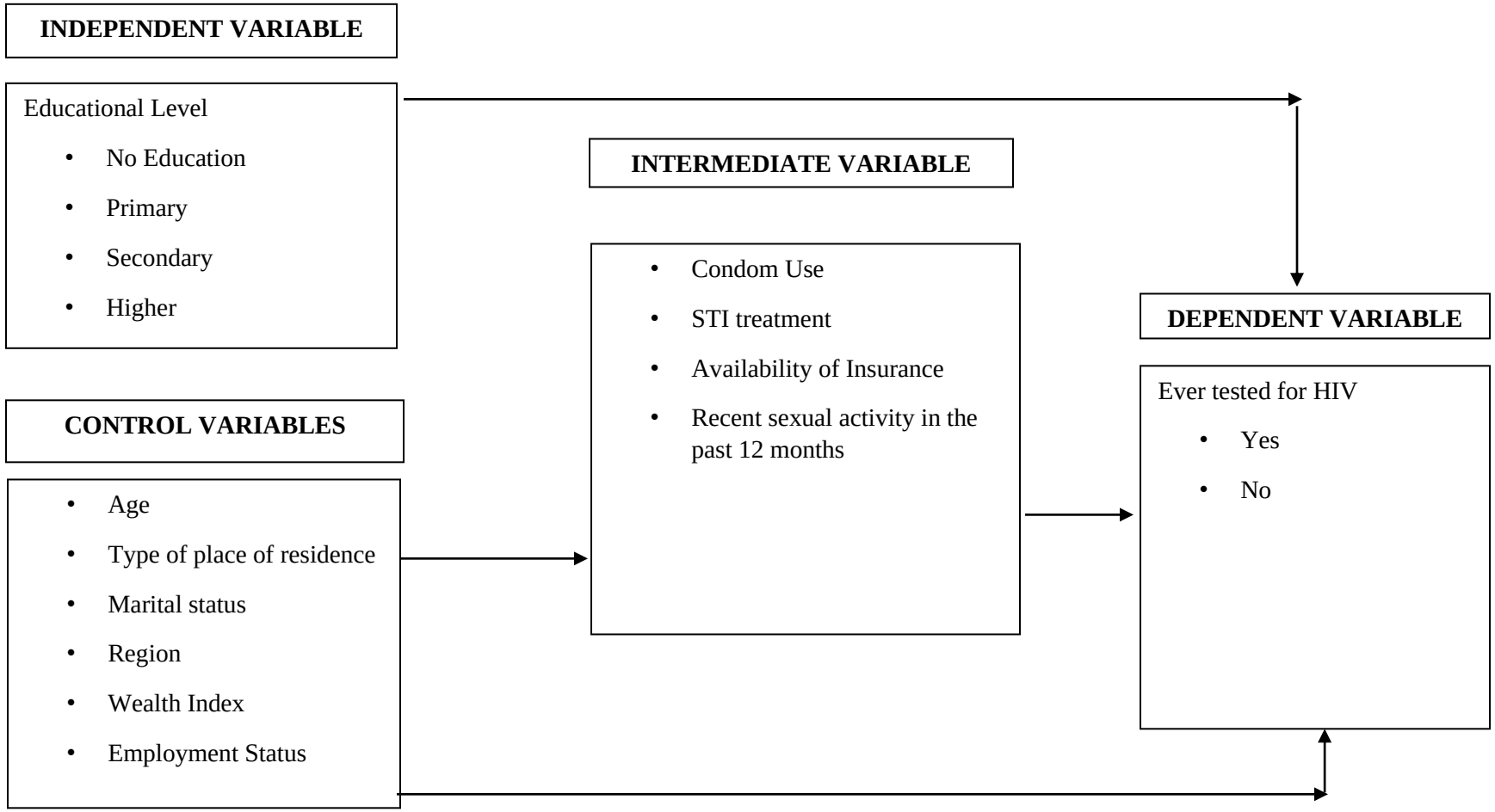
Various models exist for explaining why people would engage in AIDS preventive behavior. One such model is the Heath Belief Model (HBM) developed in the early 1950s at the U.S. Public Health Service (Rosenstock, 1974). This model has been used in a number of studies relating to AIDS-preventive behavior and its basic postulates have been supported. Unfortunately, not much work has been done with the model on African populations. One cannot, however, generalize U.S. findings to African populations without further investigation, given the existence of cross-cultural differences between Africans and Westerners.

There are a variety of reasons why we can expect the causes of behavior related to HIV infection in Africa to be different. Sociocultural factors in Africa in particular may have a major role in influencing HIV transmission. Such practices as circumcision, scarification, etc., involving the use of the same knife, while not sexual in nature, may contribute to the spread of the disease (Latham, 1993). Attitudes towards polygamy, multiple sexual partners, prostitution and different

sex acts may also be different, leading again to impacts on HIV transmission (Kagimu et al., 1995; Rwabukwali et al., 1994; Scott & Mercer, 1994; Latham, 1993; Mufune et al., 1993; Bassett & Mhloyi, 1991; Caldwell et al., 1989; Guinan & Hardy, 1987). Income and health conditions are additional factors that may operate differently in Africa to impact on AIDS transmission as well as preventive behavior.

2.6 CONCEPTUAL FRAMEWORK

Figure 2.1



Source; Authors construct, Adopted from Conner, M., & Norman P. 2005

The uptake of HIV testing services can be influenced by many factors which can grouped into independent, control and intermediary variables. The independent variable which is level of education can further be grouped into No Education, Primary Education, Secondary Education and finally Higher Education. Women with no education are less likely to have ever tested for HIV because they would not understand the information being provided whiles those with Higher education are more likely to have ever tested for HIV as they are more likely to understand the information being provided and thus opt to undertake the HIV test.

Women with some level of education who live in the urban areas are more likely to have ever tested for HIV as compared to those who have no education and live in rural areas as those in the urban areas have more options available to them to receive HIV testing services in terms of health facilities and outreach delivery points to test for HIV.

Some demographic factors such as age, type of place of residence, marital status, region of residence, wealth index and finally employment status of women can also contribute to whether a woman has ever tested for HIV or not. Women within the regional capitals who are employed are more likely to have ever tested for HIV compared to women who are outside the regional capitals and unemployed due to the fact that they are within areas where they can assess health care delivery points and also can afford if the need be for them to pay for the service being delivered. These and other factors interplay to determine whether a woman has ever taken the HIV test.

CHAPTER THREE, DATA AND MTHODOLOGY

3.1 Data Source

The study employs secondary information from the 2014 GDHS. This is a nationally representative survey comprising a total number of 9,391 women who had ever tested for HIIV in Ghana. Among the information gathered as part of the survey was generating current and reliable information on the educational level of women who had ever tested for HIV within their reproductive ages. Information generated includes knowledge about HIV, women who had ever tested for HIV, women's educational level. HIV test uptake of women in their reproductive ages. Information generated includes educational level of women as well as women who had ever tested for HIV.

Other relevant information on respondent's place of residence, marital status, employment status, region, insurance availability, condom use, number of sexual partners, STI treatment were collected. Additional information from women such as have they received HIV testing during pregnancy was as well recorded. However, this study limits itself to a section of information in the 2014 GDHS provided above, due to the objectives of this study. Information generated from the 2014 GDHS is relevant for planning as well as policy decisions in relating to general wellbeing and survival of people. Specifically, the information provided in the Ghana Demographic Health Survey was used to examine the relationship between level of education and HIV testing in Ghana.

The 2014 GDHS has been recorded as the sixth survey conducted in the country. The survey results provide the representative results for the whole country. An updated sampling frame from the Ghana Population and Housing Census (2010) was used as a frame for GDHS 2014. This

sampling frame was obtained from the Ghana Statistical Service (GSS 2013). Due to the nature of the survey, some populations were not included in the survey. Populations that were excluded from the sampling frame include nomadic and institutional populations, specifically the study excluded people in hotels, barracks, and prisons.

To provide estimates of key indicators at different levels of country (thus national, regional, urban and rural) the 2014 DHS employed a two-stage sample. Based on the total number of households (11,835), 211 and 216 clusters were selected respectively in rural and urban areas, representing a total of 427 clusters. During the second stage, a systematic approach was employed in selecting households, through a household listing operation in all the Enumeration Areas that were selected for the survey. A total of about 30 households were then selected randomly from each cluster. In this study, the unit of analysis was women aged 15- 49 years who had ever tested for HIV.

3.2 Methods of Analysis

Analysis for this study was conducted mainly at three different levels. The three level analyses conducted include univariate, bivariate and multivariate. Microsoft Excel and Statistical Package for Social Sciences (SPSS) were the tools employed for analyzing the data. The SPSS software aided in running all analyses at the univariate, bivariate and multivariate levels and was also used in sorting the data. On the other hand, Microsoft Excel was used to generate charts and graphs from the data.

3.2.1 Univariate Analysis

Univariate analysis is the first step of every statistical procedure undertaken during the investigation of survey data. At this level, single variables in the distribution were described to

obtain some basic characteristics or background features of surveyed women who were of interest to the study. Each independent variable was tabulated and after tabulating each independent variable, the results obtained were used in generating frequencies and percentages describing the background characteristics of women who have undertaken HIV tests in Ghana. This was used to summarize the variables used in the study.

3.2.2 Bivariate Analysis

The second level of analysis that was undertaken in this study was the bivariate analysis. The bivariate analysis represents the association the independent variable has with the outcome variable. At the bivariate stage, each independent variable (thus educational level, age, marital status, wealth index, type of place of residence, number of sexual partners, medical insurance, occupation and pregnancy status is run against the outcome variable which is HIV testing). The results obtained when each independent variable was run against the dependent variable represented the extent to which each of the independent variable was associated with the outcome variable which is HIV testing in Ghana. The Pearson Chi-square test was employed in this analysis at a confidence level of 5%. The Chi-square value obtained indicated the nature of association (either positive or negative) between each independent variable and the outcome variable (HIV testing).

3.2.3 Multivariate Analysis

The third stage of analysis in this study was the multivariate analysis. Since the outcome variable, HIV testing is dichotomous (thus either the person tests or does not test), the binary logistic regression analysis was conducted. All the explanatory (independent) variables together with the outcome variable were combined, thus subjecting all the independent variables together

with the outcome variable in a single model. This was carried out to find out the extent of impact all the independent variables put together have on the outcome variable, HIV testing in Ghana.

Specifically, for this study, more attention was focused on the extent to which one's level of education (no education, primary, middle/JSS/JHS and secondary and above) influences HIV testing in Ghana, controlling for other variables that can also have an impact on HIV testing in Ghana. This approach was used to test for confounding variables. Also, at the multivariate level, the tests were run at a significance level of 5% and the confidence interval, odds ratios and the p-values were analyzed to determine the statistical significance of each characteristic of women. Multivariate analysis therefore provided a better explanation with regard to the interrelationships among several variables.

3.3 Measurement of Variables

Variables in the study were defined and measured as in the Table 3.1.

Table 3.1: Measurement of variables

Variable	**Measure Type**	**Response Categories**
Ever tested for HIV	**Dichotomous**	Yes
		No
Educational Level	**Categorical**	No education
		Primary
		Secondary
		Tertiary
	Categorical	15-19
		20-24
		25-29

Age		30-34
		35-39
		40-44
		45-49
Condom use during past 12 months	**Dichotomous**	Used
		Not used
Type of place of residence	**Dichotomous**	Urban
		Rural
Employment status	**Dichotomous**	Employed
		Unemployed
Wealth Index	**Categorical**	Poorest
		Poorer
		Middle
		Rich
		Richer
Availability of Insurance	**Dichotomous**	Yes
		No
STI treatment	**Dichotomous**	Yes
		No
Marital Status	**Categorical**	Never Married
		Married
		Living together
		Widowed
		Divorced
Recent sex in past 12 months	**Categorical**	Not active in past 4 weeks
		Active in past 4 weeks
		Not active in past 4 weeks

		(postpartum)
Region of residence	**Categorical**	Western
		Central
		Greater Accra
		Volta
		Eastern
		Ashanti
		Brong-Ahafo
		Northern
		Upper East
		Upper West

Source: Generated from GDHS 2014

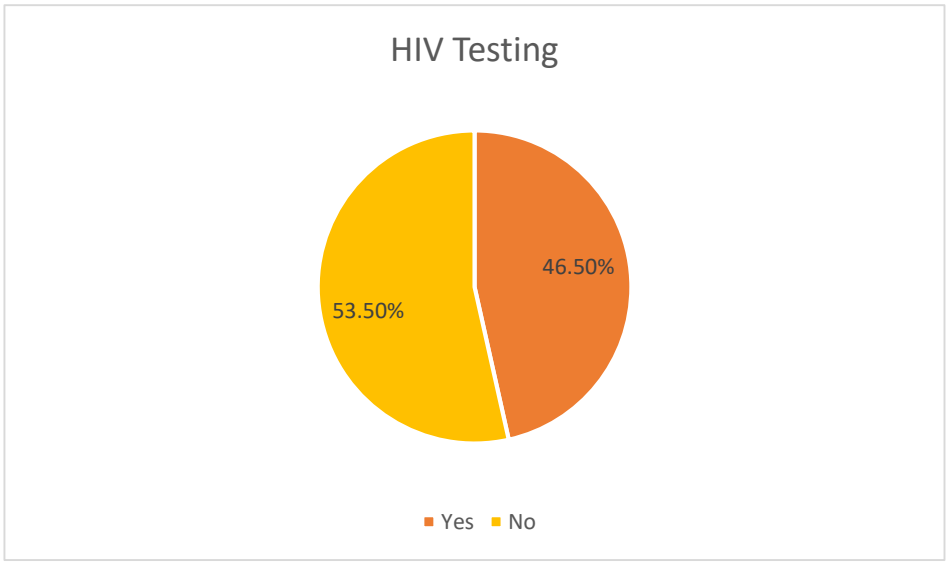
CHAPTER FOUR, RESULTS OF UNIVARIATE ANALYSIS

4.1 Univariate Analysis

This chapter presents the results of the study on demographic characteristics of respondents as well as factors that influence uptake of HIV testing and counselling among women within their reproductive ages. The results had been presented in frequencies and percentages using both tables and figures. Statistical analysis in the form of univariate, bivariate and binary logistic regression were conducted and the results presented in this section.

The figure below shows HIV testing rates among women who were sampled during the GDHS survey

Figure 4.1: Percentage of women responding Yes or No to HIV testing in Ghana



Source: Generated from GDHS 2014

Majority of women who were sampled had never tested for HIV during their lives. As many as 5,021 representing 53.5% of women sampled had never tested for HIV whiles 4,370 representing 46.5% of the women sampled had ever tested for HIV as indicated in figure 4.1.

Table 4.1 shows the demographic features of respondents who were sampled for the GDHS 2014.

Table 4.1: Demographic Factors of Women

VARIABLE	PERCENTAGE (%)	NUMBER OF WOMEN
Age of women		
15-19	18.688	1756
20-24	16.719	1571
25-29	16.645	1564
30-34	14.293	1343
35-39	13.409	1260
40-44	10.983	1032
45-49	9.259	870
Type of place of residence of women		
Urban	48.978	4602
Rural	51.021	4794
Region of residence of women		
Western	10.930	1027

Central	10.014	941
Greater Accra	10.632	999
Volta	8.461	795
Eastern	9.653	907
Ashanti	11.068	1040
Brong-Ahafo	10.696	1005
Northern	11.089	1042
Upper East	9.727	914
Upper West	7.726	726
Educational level of women		
No Education	24.276	2281
Primary	18.593	1747
Secondary	51.660	4854
Higher	5.470	514
Marital Status of women		
Never Married	32.364	3041
Married	45.157	4243
Living together	12.909	1213
Widowed	2.862	269
Divorced	2.767	260

Source: Generated from GDHS 2014

Majority of women sampled for the survey were within the ages of 15-19 forming a percentage of 18.688%. The least age group sampled for the survey were those within the ages of 45-49 and they formed 9.259% of the total number of women sampled.

Among the women sampled for the GDHS, majority were found in the urban areas (51%) whiles those within the rural areas were 49%.

Also, for the survey, the proportion of women within the Northern Region (11.089%) were higher among respondents surveyed while those in the Upper West (7.726%) were the smallest.

For the educational level of women, 51.660% of women sampled had secondary education whiles those with higher education were the least and represented 5.470%.

For the survey, married women (45.157%) formed the highest proportion of women sampled while those who were divorced were the least (2.767%).

Table 4.2 presents the socio-economic characteristics of the women sampled for the GDHS 2014.

Table 4.2: Socio Economic Characteristics of women

VARIABLE	PERCENTAGE (%)	NUMBER OF WOMEN
Condom use during past 12 months		
Not Used	92.679	6128
Used	7.320	484
Employment status		
Unemployed	27.974	2626
Employed	72.025	6761

STI Treatment		
No	29.837	589
Yes	70.162	1385
Recent Sex in past 12 months		
Not active in past 4 weeks	13.392	1258
Active in last 4 weeks	42.084	3953
Not active in past 4 weeks (postpartum)	44.522	4182
Insurance Availability		
No	34.025	3196
Yes	65.974	6197
Wealth Index		
Poorest	24.851	2335
Poorer	18.720	1759
Middle	20.242	1902
Rich	18.848	1771
Richer	17.337	1629

Source: Generated from GDHS 2014

Majority of women sampled had not used condom within the past 12 months (92.679%) whiles those who used condoms within the past 12 months were 7.320% as presented in table 4.2 above.

Table 4.2 also shows majority of women (72.025%) sampled for the survey were employed whiles the unemployed women were 27.974%.

STI treatment was another variable that was explored in the study. Women who had ever been treated for an STI were 70.162% while those who had never been treated for STI were 29.837%.

Again, a variable that was explored as part of the study was recent sexual activity within the past 12 months. Out of the number sampled, 44.522% of the women were found not to be sexually active within the past 4 weeks as a result of postpartum amenorrhea and they were the highest whiles those who did not engage in any sexual activity within the past 4 weeks which is not related to postpartum amenorrhea were 13.392%. Again, 42.084% had been active within the past 4 weeks.

Out of the women surveyed for this study, 65.974% of them had an insurance cover while 34.025% did not have any insurance cover.

Finally, majority of the women who participated in the survey were found in the poorest wealth group (24.851%), while those in the richer category formed the minority (17.337%).

CHAPTER FIVE, RESULTS OF BIVARIATE ANALYSIS

5.1 Bivariate analysis

At the Bivariate level of analysis, the independent variables were correlated with the dependent variables in the study.

Educational level was found to be statistically correlated with ever testing for HIV among women in Ghana at the Bivariate level. Women with secondary education were found to be the highest group who had ever tested for HIV.

Age was also found to be statistically correlated with ever testing for HIV among women in Ghana at the Bivariate level. It was found that those within the ages of 25-29 were found to be the highest age group who had ever tested for HIV.

Again, condom use during the past 12 months was also found to be statistically correlated at the bivariate level with ever testing for HIV. Women who were using condoms were found to have ever tested more for HIV as compared to those who were not using condoms.

Type of place of residence was among the variables that were found to be statistically correlated with ever testing for HIV at the bivariate level. Women in the urban areas were found to have ever tested for HIV more than those who were in rural areas.

Also, employment status was also statistically correlated with ever testing for HIV at the bivariate level. Unemployed women were found to have ever tested for HIV compared with employed women.

STI treatment was also statistically correlated to ever testing for HIV. Women who had never received STI treatment were the highest grouping to have ever tested for HIV compared to those who had ever received STI treatment.

Recent sexual activity within the past 12 months was also statistically correlated with ever testing for HIV among women. Women who had not had any sexual activity within the past 4 weeks because of postpartum amenorrhea represented the highest grouping to have ever tested for HIV.

Having insurance cover was statistically correlated with ever testing for HIV among women in Ghana. Women who responded yes to having insurance cover were the highest grouping to have ever tested for HIV.

Marital status at the bivariate level was found to be statistically correlated with ever testing for HIV. Married women were found to have tested higher for HIV compared to the other categories.

Wealth index was also found to be statistically correlated with ever testing for HIV at the bivariate level as women who were within the rich and richer categories represented the highest grouping to have ever tested for HIV.

Table 5.1: Bivariate analysis of independent and control variables against the Dependent variable

Variable	**Ever tested for HIV%**	**Never tested for HIV%**	**Number of women sampled**
Educational Level			
No Education	19.5	80.5	850
Primary	16.9	83.1	737
Secondary	54.7	45.3	2390
Higher	9.0	91.0	393
			P-Value <0.001

Age of respondent			
15-19	5.5	94.5	242
20-24	18.2	81.8	796
25-29	22.7	77.3	992
30-34	20.1	79.9	878
35-39	17.0	83.0	741
40-44	10.3	89.7	452
45-49	6.2	93.8	269
			P-Value <0.001
Condom Use			
Not Used	91.7	8.3	2813
Used	93.6	6.4	3312
			P-Value = 0.003
			Type of place of Residence
Urban	56.3	43.7	2462
Rural	43.7	56.3	1908
			P-Value = <0.001
Employment status			
Unemployed	34.1	65.9	1708
Employed	21.0	79.0	916
			P-Value = <0.001
STI Treatment			
No	37.7	62.3	363
Yes	22.4	77.6	226
			P-Value = <0.001
Recent Sex in past 12 months			
Not active in past 4 weeks	2.9	97.1	126

Active in last 4 weeks	48.2	51.8	2105
Not active in past 4 weeks (postpartum)	48.9	51.1	2139
			P-Value = <0.001
Insurance Availability			
No	27.0	73.0	1179
Yes	73.0	27.0	3191
			P-Value = <0.001
Marital Status			
Never Married	18.2	81.8	794
Married	55.9	44.1	2443
Living together	16.1	83.9	704
Widowed	2.5	97.5	109
Divorced	2.8	97.2	122
No longer living together/separated	4.5	95.5	198
			P-Value = < 0.001
	Wealth Index		
Poorer	17.2	82.8	750
Poor	17.3	82.7	756
Average	20.5	79.5	898
Rich	22.5	77.5	982
Richer	22.5	77.5	984
			P-Value = <0.001

Source: Generated from 2014 GDHS

CHAPTER SIX, RESULTS OF MULTIVARIATE ANALYSIS

6.1 Binary Logistic Regression

This section analyses the relationship between the independent variable (educational level) and the dependent variable (HIV testing). Also, all selected variables were analyzed in relation to HIV testing. This was done to examine the extent by which these variables influence HIV testing rates among women in Ghana. A binary logistic regression was employed for studying and analyzing the statistical relationship between the dependent variable which is dichotomous or binary and one or more independent variables, which can either be categorical or continuous. The reason for using the binary logistic regression is that the nature of the dependent variable of interest in this study, measured by HIV testing is dichotomous (that is whether a woman has either tested or not tested for HIV in the survey).

For all variables used in this study, reference categories (labeled as RC) were created to ensure easy comparison using exponential β which represents the odds ratios. In all, two binary regression models were fitted. For the first model (model 1), the level of education of women was regressed on HIV testing to examine the relationship between these two variables. In the second model (model 2), educational level of women, intermediate variables as well as control variables were altogether regressed on HIV testing among women to examine the effects of the variables on ever testing for HIV.

In all models, the results were interpreted in two different ways. First was to determine whether there is a statistically significant relationship between selected independent variable(s) and the dependent variable at 0.05 margin of error (representing a 95% confidence level). Therefore, variable(s) with a p-value less than 5% (< 0.05) were treated as statistically significant variables

in explaining the occurrence or not of the dependent variable (that is ever testing for HIV in the survey). Secondly, the relationships between the independent variables and dependent variable were explained using the odds ratios. This was specifically done by examining the probability of ever testing for HIV when compared to a reference category (RC) set as 1, with the use of the odds ratios (that is the exponential β). Hence, an odds ratio value less than 1 depicts a less likelihood of ever testing for HIV, a value greater than 1 shows a greater likelihood of ever testing for HIV and a neutral value of 1 indicates that there is no relationship or an absence of relationship between the variables.

6.2 The Effect of Educational level on ever testing for HIV among women in Ghana

Educational level of women was regressed on ever testing for HIV in Model 1. The result obtained in Model 1 as presented in Table 6.1 shows that the level of education of women has a statistically significant association with ever testing for HIV. It showed that women with higher education were 5.464 as likely to have ever had HIV test as those with no education. This was then followed by those with secondary education who were 1.633 as likely to have ever been tested for HIV compared to those with primary level education who were 1.230 as likely to have ever been tested for HIV in comparison with those with no education. A recorded Nagelkerke R^2 of 4.2% indicates that educational level of women explains less than five percent of the variation in ever testing for HIV among women in Ghana. This implies that other variables (socio-economic, demographic, lifestyle) can help explain the variations in HIV testing better. Also, the model correctly predicts 56.4% of the response.

Table 6.1: Model 1: A Binary logistic regression model showing the variation in ever testing for HIV by level of education.

Variable Indicator	OR, 95% CI	P-Value
Educational Level		
No Education (RC)	1	
Primary	1.230 [1.083, 1.397]	0.001
Secondary	1.633 [1.475, 1.808]	0.000
Higher	5.464 [4.382, 6.814]	0.000
Constant	-0.520	<0.001
Correct % Prediction	56.4%	
Nagelkerke R2	0.042%	
Model chi-square (df)	0.000(2)	

Source: Generated from 2014 GDHS

Table 6.1 shows a statistically significant relationship. This result is consistent with earlier findings reported at the bivariate analysis as depicted in Table 5.1 and is also consistent with findings by Ziraba et al. (2011) that in urban informal settlements in Nairobi, the proportion of people ever tested for HIV increased with educational attainment. The result in this study shows that educational level of women has a significant influence on ever testing for HIV among women in Ghana in the absence of other factors.

6.3 The effect of educational level, control variables and intermediate variables on ever testing for HIV among women in Ghana

Model 2 (Table 6.2) shows the influence of educational level, intermediate variables and control variables when regressed on ever testing for HIV among women in Ghana. From Table 6.2, a Nagelkerke R^2 value of 26.9% was obtained. This shows that about 27% of the variation in ever testing for HIV among women in Ghana is explained by all the variables used in the model. Also, the model correctly predicts 69.9% of the response. When the independent, control and intermediate variables were analyzed together, educational level, which is the variable of

interest, was found to be a statistically significant predictor of ever testing for HIV among women in Ghana (p-value =0.002 for primary, 0.000 for secondary and 0.000 for higher education), which is consistent with the first binary regression model run with level of education done.

The result shows that women with higher level of education had odds ratios of 4.262, implying that these women were four times as likely to have ever tested for HIV as compared to those with no education which is the reference category set at 1. This was followed by those with secondary education with odds ratio of 2.357 which implied that they were two times as likely to have ever tested for HIV as those with no education being the reference category set at 1 and finally those with primary education had odds ratio of 1.812 which implied that they were 1.8 times as likely to have ever tested for HIV as compared with women with no education which is the reference category set at 1. Also, the age of women, type of place of residence, insurance cover, receiving STI treatment and information, marital status and sexual activity in the past 12 months were statistically significant (at p-value < 0.05) in explaining or predicting ever tested for HIV.

Table 6.2: A Binary logistic regression model showing the variations in ever tested for HIV by educational level, control and intermediate variables

Variable Indicator	OR, 95%	CI	P-Value
Educational Level			
No Education (RC)		1.000	
Primary	1.812	[1.246, 2.635]	0.002
Secondary	2.357	[1.674, 3.318]	0.000
Higher	4.262	[2.292, 7.924]	0.000
Age of women(Groups)			
15-19 (RC)		1.000	
20-24	2.577	[1.687, 3.937]	0.000
25-29	3.039	[1.888, 4.892]	0.000
30-34	3.141	[1.868, 5.282]	0.000
35-39	2.466	[1.431, 4.249]	0.001

40-44	1.035	[0.582, 1.841]	0.906
45-49	0.686	[0.341, 1.381]	0.291
Region of Residence			
Western (RC)		1.000	
Central	1.515	[0.891, 2.575]	0.125
Greater Accra	1.128	[0.669, 1.901]	0.652
Volta	1.098	[0.668, 1.804]	0.713
Eastern	1.609	[0.927, 2.792]	0.091
Ashanti	1.025	[0.622, 1.690]	0.922
Brong-Ahafo	0.988	[0.616, 1.584]	0.961
Northern	0.601	[0.360, 1.004]	0.052
Upper East	1.718	[0.895, 3.298]	0.104
Upper West	0.761	[0.404, 1.433]	0.398
Place of Residence			
Urban (RC)		1.000	
Rural	0.647	[0.482, 0.869]	0.004
Wealth Index			
Poorest (RC)		1.000	
Poorer	1.312	[0.897, 1.918]	0.162
Middle	1.259	[0.843, 1.882]	0.26
Richer	1.484	[0.928, 2.371]	0.099
Richest	1.417	[0.824, 2.435]	0.207
Marital Status			
Never Married (RC)		1.000	
Married	4.343	[3.030, 6.223]	0.000
Living together	2.843	[1.957, 4.130]	0.000
Widowed	2.394	[0.743, 7.717]	0.144
Divorced	4.349	[2.011, 9.405]	0.000
No longer living together/Separated	2.497	[1.428, 4.368]	0.001
Recent sex in past 12 months			
Not active in past 4weeks (RC)		1.000	
Active in last 4weeks	1.844	[1.091, 3.119]	0.022
Not active in past 4weeks (postpartum)	1.036	[0.806, 1.332]	0.780
Employment status			
Unemployed (RC)		1.000	
Employed	0.958	[0.722, 1.271]	0.766

Condom used during last sex with most recent sexual partner			
Not Used (RC)		1.000	
Used	0.907	[0.615, 1.338]	0.626
Receive STI Treatment			
No (RC)		1.000	
Yes	1.353	[1.047, 1.750]	0.021
Have Insurance			
No (RC)		1.000	
Yes	1.951	[1.535, 2.480]	0.000
Constant		0.000	<0.001
Correct % Prediction		69.9%	
Nagelkerke R square		28.8%	
Model chi-square (df)		13.213 (8)	

Source: Generated from 2014 GDHS

The results from Table 6.2 (Model 2) portray that educational level was statistically significant ($p<0.001$) in predicting ever testing for HIV in Ghana. Age of women was also found to be significant predictors or determinants of ever testing for HIV. It was observed that women who were between the ages of 30-34 had the highest likelihood of ever testing for HIV with an odds ratio of 3.141 as compared to those within the reference category between the ages of 15-19. This was followed by those between the ages of 25-29, 20-24 and 35-39 with odds ratios of 3.039, 2.557 and 2.466 respectively as compared to the reference category of women between the ages 15-19 set at 1. However, the results for women of ages 40-44 and 45-49 were not statistically significant in the analysis of ever testing for HIV among women as compared to the reference category of women between the ages of 15-19.

The results also indicated that place of residence of women was statistically significant in predicting ever testing for HIV. It was observed that women who lived in rural areas had an odds

ratio of 0.647, implying that they were about 0.353 less likely to have ever tested for HIV compared to those in the urban areas which is the reference category set at 1. This finding is consistent with studies by Ziraba et al., (2011) and Cherutich et al., (2012) that women living in rural areas are less likely to have ever tested for HIV as compared to those in urban areas.

Marital status was also found to be a significant determinant of ever testing for HIV among women in Ghana. A statistically significant association was found showing that married women, women living together with men, divorced women and women who are no longer living together or have separated showed results that were statistically significant. Married women were found to be 4.3 times as likely to have ever tested for HIV compared to women who had never married representing the reference category, women who were living together with men were 2.8 as likely to have ever tested for HIV compared to those never married, divorced women were 4.3 as likely to have ever been tested for HIV compared to never married women and finally women who were no longer living together with their partners or have separated were 2.5 as likely to have ever tested for HIV as women who had never married being the Reference Category set at 1. This depicts that women who were divorced were more likely to have ever tested for HIV, followed by married women, women who are living together with their partners and finally women who had separated or no longer living with their partners. The results for women who were widowed were not statistically significant in the analysis of whether a woman will ever test for HIV or not.

In addition, women who were sexually active within the past 4 weeks showed statistically significant results in the analysis on testing for HIV in Ghana among women; they were 1.8 times as likely to have ever tested for HIV as those who were not sexually active within the past 4 weeks.

Furthermore, there was a statistically significant relationship between seeking STI treatment and ever testing for HIV among women in Ghana. The results obtained with regard to STI treatment indicate that women who sought STI treatment had odds ratio of 1.4, indicating that they were more likely to have ever tested for HIV compared to those who had not sought any services for STI being the reference category set at 1.

Also, insurance cover was a significant determinant of ever testing for HIV among women in Ghana. The results showed that women who had some form of insurance had an odds ratio of 1.9, indicating that, they were more likely to have ever been tested for HIV compared with women who had no source of insurance being the reference category set at 1. This depicts that women with insurance cover are as likely to have ever been tested for HIV compared to those without insurance cover.

CHAPTER SEVEN, DISCUSSION OF RESULTS

7.1 DISCUSSION

The study sought to examine the effect the level of education has on HIV testing among women in Ghana. Most of the women who were sampled for the study had secondary level education, representing 51.7% of the total number of women sampled for the survey. The proportion of women who had ever tested for HIV was 46.5%. The binary logistic regression analysis shows that educational level was significantly associated with ever testing for HIV ($p<0.001$). With regard to educational level, it was seen that the higher the level of education, the more likely it was for the women to be ever tested for HIV and this association was significant at all levels of education as indicated in Table 6.1 (OR=0.594, 95% CI=1.230-5.464, p=0.001) for primary level education.

Women with some level of education were therefore found to be associated with the odds of ever testing for HIV in Ghana. This association however increases with level of education, thus the higher the level of education, the stronger the association with ever testing for HIV among women in Ghana. This may be as a result of most of the women having increased their educational level thereby acquiring more knowledge about HIV such that they are more desirous to go in for an HIV test to be able to know their status and thus commit to living a risk-free lifestyle devoid of HIV hence the positive correlation between HIV testing and educational level of women. The multiple regression analysis also indicated that educational level was statistically significant for predicting women ever testing for HIV in Ghana. Age was found to be

significantly associated with ever testing for HIV among women. Women within the ages of 30-34 had the highest proportion of HIV test uptake. This could be as a result of increased health care uptake for women within that age group because of concerns related to late child bearing, in addition to this, women in these ages also receive free antenatal care at government hospitals as is the case for all pregnant women in Ghana and here they receive information on the importance of getting tested for HIV whiles pregnant in order to protect their unborn children if they were to test HIV positive as it were. Hence many women opt for HIV testing during antenatal services in Ghana which might account for the high proportion of women who had ever tested for HIV within that age group. This is also similar to findings by Tenthani et al., (2015) in Malawi where they found that women within the ages of 20-34 years were more likely to opt for an HIV test during their antenatal visit as compared to those older than 34 years. Again, this finding was also similar to a study by Kalanzi (2013) that university students were more likely to have tested for HIV as compared to participants from the general public. The study found 62% of the university students saying they had tested for HIV compared to 49% from the general public that had tested for HIV.

Again, the findings of this study about HIV testing among women in Ghana by region of residence was not significantly correlated or associated with them ever testing for HIV. This was particularly interesting because according to the HIV sentinel survey report, Eastern region recorded the highest prevalence of HIV in 2014. Thus, more attention would have been put into reducing the high HIV prevalence by intensifying HIV testing campaigns and to contribute to a reduction in the prevalence rates. This was not the case as all the regions when regressed against HIV testing uptake were not statistically significant. This meant that even though HIV prevalence according to the 2014 HIV Sentinel Survey report was high in the Eastern Region, it

did not automatically increase testing uptake for the region. This could be because HIV services are not readily available to clients in the regions or are concentrated in the regional capital hence the difficulty for women outside the regional capital to go to these places to get tested.

Place of residence was found to be statistically significant in determining the HIV test uptake among women in Ghana (p=<0.004). Urban residents were more likely to have ever tested for HIV among women in Ghana. This is because of the proportionally greater number of healthcare facilities available to urban women as compared to those in rural areas of the country. It can also be attributed to the increase in educational campaigns run within the urban areas as compared to campaigns in the rural areas. The urban women have a plethora of healthcare options available to them to select from coupled with the high levels of education on HIV, knowledge levels are increased and thus contribute in reducing stigma and discrimination in these urban areas making it easy for women get HIV tests done at their convenience and switch hospitals for testing if they feel there might be some form of stigmatization there. This finding is consistent with similar studies by Cherutich et al., (2012) in Kenya and Makadzange et al. (2010) in Zimbabwe where they found that women in urban areas because of the availability of different testing options available to women including home-based testing, receiving testing during antenatal visit among others, were more likely to have ever tested for HIV than those in rural areas.

For marital status, a higher proportion of the women sampled were married (45.2%) while the least number of women who participated in the survey were divorced.

Interestingly, findings for this study showed that wealth index was not a significant predictor of ever testing for HIV among women in Ghana. This could also be accounted for by the fact that HIV testing is free and hence one does not require money to get tested for HIV. This therefore

could account for wealth index not being a significant predictor of ever testing for HIV among women in Ghana.

Sexual activity with most recent partner within the past 12 months among women who were sexually activite within the past four weeks was found to be a significant determinant of ever testing for HIV (OR=1.844, 95% CI=1.091-3.119, p=0.022). This could be because of their perceived risk associated with the kind of sex they might be having; if unprotected, then they would rate their risk as high especially if the partner is not her usual sexual partner thus causing them to test for HIV and vice versa. It could also be that during that 12-month period, they were engaged in unprotected sexual activities with multiple sexual partners thus rating their risk of getting infected with HIV very high, hence the need to go for the HIV test.

Employment status of women was also not a significant determinant of ever testing for HIV. Employed women were less likely to test for HIV as compared to unemployed women.

Correct and consistent use of condoms among women was also not significant in determining whether a woman had ever been tested for HIV or not. This was also an interesting finding because of the risk levels involved in contracting HIV from a sexual partner without the use of condoms. It is, however, noteworthy that women who used condom even though not significant were less likely to have ever been tested for HIV compared to those who do not. This implies that the use of condoms by women gives them a sense of security and this sense of security them comfortable of being free from HIV thus they not taking the HIV test. This finding is however inconsistent with a study conducted in Zimbabwe which sought to determine factors associated with ever test for HIV among men and women by Makadzange et al. (2010). They found that women who reported consistent and correct use of condoms were less likely to have ever been

tested for HIV. They attributed this to biases that may arise from misreporting of information on sexual behaviours, cross-sectional studies prohibit the distinction between cause and effect and as such it is difficult to establish whether the reported sexual risk behaviours preceded HIV testing or vice-versa.

Again, the study revealed that STI treatment was a statistically significant determinant of ever testing for HIV among women in Ghana. Women who had received an STI treatment in their lifetime were more likely to have ever been tested for HIV as compared to those who had not received any treatment for STI (OR=1.353, 95% CI= 1.047-1.750, p=0.021). Women who receive STI treatment at hospitals have the option of receiving an HIV test as part of the treatment package. This, therefore, allows for women to opt to have an HIV test as part of their STI treatment. This finding is also consistent with that of Makadzange et al., (2010) in Zimbabwe where they found that women who had previously received an STI treatment were more likely to have tested for HIV.

From the multiple regression analysis, it was found that having a form of insurance cover was statistically significant in determining whether a woman had ever tested for HIV in her lifetime or not (OR=1.951, 95% CI=1.535-2.480, p<0.001). This may be because of women being more likely to test for HIV if they believe they would receive the needed care and support for treatment because of an insurance cover they might have. This finding is similar to what Kates and Levi (2007) found in their study on insurance coverage and access to HIV treatment in the United States of America. They found that people were more likely to test for HIV when they have an insurance cover because they believe they would receive the complete standard of HIV care once they test positive and would not need to incur additional cost in managing the infection.

CHAPTER EIGHT, CONCLUSION AND RECOMMENDATIONS

8.1 CONCLUSION

In concluding, the results of the study suggested that educational level, age, marital status, type of place of residence, recent sexual activity, receiving STI treatment and having an insurance cover were significant determinants of HIV testing among women in Ghana.

The hypothesis that women with higher level of education are more likely to have ever tested for HIV compared with women with no education was therefore accepted as it was found that women with higher education were 4.3 as likely to have ever tested for HIV as those with no education who were 1.0 as likely to test. The possible explanation can be that women with higher level of education are exposed to more information on the benefits of testing early for HIV as it greatly improves management if the test outcome is positive.

Again, the hypothesis that women between the ages of 30-34 are as likely to have ever tested for HIV compared with those between the ages of 15-19 is also accepted as it was found through the study that women within ages 30-34 were 3.141 times as likely to have ever tested as compared with their counterparts of 15- 19 who were 1.0 times as likely to test. The possible reason for this is that women who are within the age group 15-19 are not yet sexually active and do not have any motivation to know their HIV status. This is because most of them would be in school during that period. But the women between the ages 30-34 will most likely be sexually active and might be having children at this period and hence need to know their HIV status especially if they are pregnant.

8.2 RECOMMENDATIONS

HIV/AIDS is a public health concern and to be able to control the spread of this infection one needs to know her/his status in order to take appropriate actions that would protect him/her from contracting the virus if one tests negative for HIV or take appropriate actions to boost ones health in order to live a long and healthy life with HIV if one tests positive for HIV. Considering that only forty-five percent of Ghanaians who live with the virus know their status, it is very imperative that efforts are strengthened in the area of education to sensitize women on the need to know their HIV status.

Health awareness campaigns should also be carried out on the need to get registered for health insurance as a lot of the services needed by HIV positive clients are covered by the insurance scheme and these include some of the laboratory tests an HIV positive person would have to run in order to be enrolled on anti-retroviral therapy.

Also, the campaigns being carried out in the rural areas which has increased the testing rates in the rural communities should be replicated in the urban areas to get more women to get tested for HIV since generally there has been a drop in HIV awareness campaigns for a while now.

Finally, strengthening and equipping of the non-formal division of Ghana Education Service to intensify rural education and literacy especially of the females. Also, the Community Health Nurses and the Community-Based Health Planning and Services (CHPS) concept should be heightened to make it more relevant to rural communities in bridging the disparity between access to quality maternal health services at ANC and health literacy on the benefits of receiving HTC among others

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