UNIVERSITY OF GHANA

HEALTH LITERACY AND SEXUALLY TRANSMITTED INFECTIONS (STI'S) AMONG UNIVERSITY OF GHANA FEMALE STUDENTS

BY

ANGELA ABROSO

(10329961)

THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF MPHIL IN BUSINESS ADMINISTRATION (HEALTH SERVICES MANAGEMENT OPTION) DEGREE.

JULY 2013

DECLARATION

I do hereby declare that this work is the result of my own research and has not been presented by anyone for any academic award in this or any university. All references used in the work have been fully acknowledged.

I bear sole responsibility for any shortcomings.

…… …….

ANGELA ABROSO DATE

(10329961)

CERTIFICATION

I hereby certify that the thesis was supervised in accordance with procedures laid down by the university.

…….. ……

DR. ALBERT AHENKAN DATE

(SUPERVISOR)

DEDICATION

This work is dedicated to Almighty God for seeing me through, to my parents Mr. and Mrs. Addo-Abroso and my siblings for their immense support throughout my study.

ACKNOWLEDGEMENT

I wish to express my honest gratitude to my supervisor Dr. Albert Ahenkan for his guidance, constructive comments, suggestions and encouragements towards the completion of this study.

My appreciation also goes to all lecturers and faculty of the Department of Public Administration and Health Service Management, University of Ghana Business School for their support throughout my study.

I wish to also thank faculty of the Department of Epidemiology and Disease Control for the support throughout my study.

Am highly indebted to Mr. Emmanuel Asampong and my colleagues, Daniel Nanayaw Abankwah and Anthony Godi who encouraged and helped through every stage of this work.

Thank you and may God richly bless you all.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
AEL	Adult Education Learning
BV	Bacterial Vaginosis
CDC	Centre for Disease Control
CSR	Corporate Social Responsibility
DNA	Deoxyribonucleic Acid
ECOSOC	Economic and Social Council
ETS	Educational and Testing Service
GUM	Genitourinary Medicine
GSS	Ghana Statistical Service
HALS	Health Activities Literacy Scale
HIV	Human Immune-deficiency Virus
HPV	Human Papillomavirus
ICT	Information and Communication Technology
IOM	Institute of medicine
LGV	Lymphogranuloma Venereum
NAAL	National Assessment of Adult Literacy
NALS	National Adult Literacy Survey
NGOs	Non- Governmental Organisations
NHS	National Health Service
PID	Pelvic Inflammatory Diseases
REALM	Rapid Estimate of Adult Literacy of Medicine
SPSS	Statistical Package for Social Sciences
STD	Sexually Transmitted Disease

STI	Sexually Transmitted Infection
SWAA	Society for Women and Aids in African
TFR	Total Fertility Rate
TOFHLA	Test of Functional Health Literacy in Adults
UNAIDS	United Nations Programme on HIV/ Acquired Immune Deficiency Syndrome
UNESCO	United Nations Educational, Scientific and Cultural Organization
WHO	World Health Organisation

ABSTRACT

The motivation to study the influences of health literacy and sexually transmitted infections emanates from the fact that there is a high rate of infection of STIs and an associated death toll globally. The study, a cross-sectional design, in the University of Ghana employed quantitative methods using a survey approach to sample views from female students from various academic levels and across the humanities and Science disciplines.

The study found that female students had appreciable knowledge in the causes and prevention of STIs but exhibited less knowledge on symptoms and type of STIs. Abstinence was noted as the commonest mode of prevention and only 2.3% of female students have had an STI before, reflecting prevalence rates in the Africa region. Ninety percent of female students showed Adequate functional health literacy. There was no significant variation, however, of health literacy level with respect to educational level, suggesting a lack of variation in the academic level of students. Correlational analysis showed a weak association between Health literacy and attitudes towards STI but suggested that high literacy level led to a healthy attitude toward STI and sexual health. Other results are that students used different treatment avenues such as hospitals, clinics and herbalists to treat STIs. A recommendation is to develop knowledge about STIs among the female students by raising awareness and building capacity of the students. Further research should sample participants from very distinct educational strata and factor in culture to determine the role it plays in attitudes towards STIs given education and health literacy levels.

INTRODUCTION: CHAPTER ONE

1.0 Introduction

The Study investigates Effects of Health Literacy on Sexually Transmitted Infections among University of Ghana Female Students.

The preliminary chapter presents the background to the study which illuminates the subject matter in a way which easily leads to defining the problem to be investigated in this thesis. It is then followed by the objectives of the study, significance of the study, hypothesis and scope and limitations of the study. The chapter ends with the structure of the study which gives an overview of the thesis.

1.1 Background to the study

Literacy and education are often markers for larger, socioeconomic issues that relate to greater risk for sexually transmitted Infections (STIs) and less access to health care (Fortenberry, McFarlane, Hennesey, Bull, Grimley, et al (2001). Literacy and education are seen as the bedrock of every nation. Indeed any nation with minimal education of its people and or with only a fewer people educated has found it inimical to their progress as a society in all spheres – economic and culture as well. Health literacy is not an individual problem; it is a societal problem. People face numerous challenges as they seek health information. These include the complexity of the health systems, the rising burden of chronic disease, the need to engage as partners in their care, and the proliferation of consumer information available from numerous and diverse sources. The reason for this challenge of understanding health information and using it appropriately is not far-fetched. For example, though few people are illiterate in countries such as the United States and Canada, in the sense that they cannot read or write at all, survey data have suggested that many people have difficulty using the many complex print materials required for routine tasks of everyday living with

accuracy and consistency, including those tasks within health contexts (Rudd, Anderson, Oppenheimer, and Nath, 2007). In fact a report brief in April 2004 by the institute of Medicine (IOM) (2004) states that nearly half of all American adults—90 million people—have difficulty understanding and acting upon health information. This shows that literacy goes beyond just schooling.

The health literacy of an individual directly impacts that individual's healthcare status and quality of life. Learning about health and healthy living thus become the singular prerogative of every person. In the same vein, providing healthcare information that is understandable enables an individual to make informed decisions regarding healthcare and is considered by many to be an ethical responsibility of healthcare providers (Gazmararian, Curran, Parker, Bernhardt, & DeBuono, 2005; Nutbeam, 2000). Hence, empowering individuals and communities with health literacy skills should then be considered as an ethical responsibility by concerned stakeholders and the ordinary person. Countries with generally low literacy skills suffer the consequences of the ignorance of health knowledge.

It is estimated that Ghana's literacy rate is 57.9% (2011 est.), a reduction from 76.9% in 2005 (Encyclopaedia Encarta, 2009). This is so in spite of the fact that there is a compulsory education for nine years for every Statistics from the Ghana Statistical Service shows that as at 2003, child. the net enrolment ratio in primary and Junior High School ranges between 2.3% (recorded in Tolun-Kumbungu in Northern Ghana) and 49% (in the Accra metropolis) (GSS, 2007). There have been improvements though, following that year. However, after the period of free and compulsory education - nine years of primary and junior secondary education - many young

people find themselves dropping off from the educational journey. Though these children at ninth grade or Junior high School leavers can read and write, they generally lack health literacy skills. This could be attributed to the perceived 'irrelevance of health information' to children. Against some cultural tenets in Ghana, health information especially that which has to do with sexual and female reproductive health is hardly taught to children below the ages of 14 to 17 years. It thus suffice that, at the completion of age of 14 (normally age for completing JHS), many children are almost ignorant about health information especially pertaining to sexuality. The crux of the issue to be appreciated here is against the background that these pupils cannot understand health information in a forthright manner when they have become adults.

It should be appreciated that low literacy could influence STI related care at any age group. The relationship between literacy, stigmatization for STI is quite multifaceted and even more complex in Ghana. While people with low literacy might experience a strong sense of stigma, they might also be branded by society as 'immoral' without any recourse to the mode of transmission of these STIs. Stigma is a pervasive barrier to STI related care seeking. Stigma associated with both low literacy and a perceived need for STI related care could be an important barrier to care. In another breadth, the behaviour of society towards individuals seeking health information is unhealthy at times. This is exemplified by the fact that peers and parents tag youth who inquire about sex information as delinquent. For many parents divulging such information might rather result in adverse results in the moral life of the child. Peers also pass comments that suggest that one is loose in his sexual life. This type of stigma also

creates a barrier to health knowledge and seeking care for STI related cases even among the educated.

The efforts made so far in health literacy

Efforts have been made by government and nongovernmental organisations (NGOs) in the past decade to particular champion girl child education, sexual and female reproductive health. While some successes have been chalked, the cultural underpinnings highlighted above seem to have played a strong role. Some efforts to curb the high literacy rates are seen in the Adult Learning Education (ALE) programme and the Society for Women and Aids in Africa (SWAA) Ghana and other interventions by the relevant ministry and government agencies.

Adult Learning and Education (ALE) in Ghana is a literacy endeavour that seeks to educate adults and is also concerned with women issues. According to a report by the Ministry of Education, Science and Sports in March 2008, ALE has addressed the challenges of poverty, migration (north-south and rural-urban), illiteracy, urbanization, high population growth, poor sanitation, social vices and youth unemployment, through the promotion of non-formal education in literacy drives, capitation grants and the school feeding programme to entice more children into the basic level and to support them to complete schooling. Whiles this is evidence of the effort of literacy education in Ghana it also defines education – literacy – as an important component in solving many societal problems.

The Society for Women and Aids in Africa (SWAA) Ghana is actively involved in education and advocacy programs on HIV/AIDS. Among other achievements, they have reached out to over 100,000 men and women through one-on-one or small group interventions; and have 800 trainers for advocacy on gender and HIV and female

condoms (http://www.swaagh.org/achievements.php). All these efforts which are not particular on literacy in health per se have contributed immensely to health literacy. There have also been conscientious efforts by government through the Ghana National Aids Commission for example to educate people about sexually transmitted diseases.

A perspective of health literacy in Ghana

The next couple of paragraphs would attempt to reveal the issue of literacy extending a relation with sexual behaviour by using verifiable illustrations. In Ghana, an emerging societal problem has to do with sexual behaviour of the youth following the incidence of cross-culture and generally globalisation. Many platforms such as the media, talk shows, special school sessions or seminars have raised concerns over what they call moral decadence. Nonetheless, this worry is not uncommon to all age groups.

In some communities especially those in the hinterlands, and the slums and undeveloped areas of the capital cities in Ghana, the inhabitants, both men and women are of all age groups. The fertility rate known among these men and women just like in many sub Saharan African countries is high (UN, 2009). A visit to these places would reveal that many children of school going age are not in school. This is because their parents, (many of whom are single parents and young), are not able to 'cater' for their children's education. Bongaarts (2011) observes the lack of education among other factors account for a desire for large families, which in turn leads to high fertility.

Such inabilities have been attributed to economic reasons and lack of knowledge on the part of the inhabitants on the importance of education. Furthermore the high fertility rate which gives credence to the form of sexual behaviour has also been attributed to the lack of education about female reproductive health and use of contraceptives. The question then surfaces: can a cycle of sexual health ignorance be left to perpetuate a supposedly forward moving society?

Another perspective arises from the fact that moral decadence can cut across all age groupings and social strata; for example it is not exclusive to the segment of the population described above. Moral decadence has been noted to be rife among the youth in the capital cities, and in the very developed parts of Ghana where many people have not only schooled but have attained substantial progress in education. It is therefore quite mind baffling then - how the very educated people, students, who can read and write would be immersed in such a problem. The findings by IOM that half of American adult population cannot comprehend health information can only explain this possibility. Perhaps the phenomenon could be an indication of the type of education that is received in schools. It is expected that education will cure ills for which it was designed for. In as much as the sexual behaviour of the young and also the old have become unruly, one begins to wonder about the effect of education on sexual behaviour of persons. Among the cosmopolitan population being described here, there is a comparative reduction of unexpected pregnancies but that same cannot be said boldly about contraction of STIs.

Therefore, while it would be wrong to infer that moral decadence is as a result of low literacy on health issues, the phenomenon of moral decadence still informs critically

on the perception of the young, in spite of their level of educational attainment. This aspect reveals a potential problem with estimating literacy with years of schooling. The approach – of estimating literacy with years of schooling - would be heavily biased because it does not control for the quality of education, variations in standards of education, content of curriculum, or the influence of broader socio-demographic factors.

It also does not take into consideration the impact on one's literacy level or opportunities to learn outside of traditional schooling. Some people are without formal education but have the requisite skill to meet the standard literacy level. In the same vein others have received 'high' levels of education but might exhibit poor literacy level. Both groups may meet challenges when they encounter situations in which they need to access appropriate services or understand health information in making decisions and taking action to support their health or that of their family members. It is within the context of increasing awareness among academics and policy makers of the links between literacy and health that the concept of health literacy in the first place made its appearance.

The concept is already evolving and though the relationship between health literacy and health outcomes have not been firmly established, there is growing evidence that people with low levels of health literacy experience poorer health (Ronson and Rootman 2004). Fortenberry et al (2001) showed that 32% of individuals receiving treatment at sexually transmitted infections clinics have reading levels below the ninth grade. Their study even showed that lower literacy patients perceive themselves to be at higher risk for STIs and yet are less likely to be screened for infection and are less likely to seek STI care.

1.2 Statement of the problem

There seems to be a gap – a lack of explanation - between formal education and health literacy levels in one instance and in another, the perception about sexually transmitted infections which also influences health literacy level and sexual behaviour. The level of health literacy among the selected case which is an elite one would reveal the relationship between education and health literacy and motivations towards chosen sexual behaviour by individuals.

The problem of concern here essentially emanates from the fact the there is a high rate of infection of STIs (Latif *et al*, 1986) and an associated death toll globally (Lauristen *et al.*, 1997). Developing nations such as Ghana with less medical facilities and insufficient funds to engage in massive literacy education usually have higher than average rates. With improvement in literacy levels, researchers should be concerned about the mismatch between efforts on improved access to education and the increasing or rather non –reducing phenomena of STIs.

Research indicates that low health literacy contributes to a number of health and health care problems (Kirsch, Jungeblut, Jenkins, & Kolstad, 2002). Low health literacy is associated with lack of knowledge and understanding about health conditions and services; inability to implement appropriate self-care activities; difficulty understanding medication instructions and adhering to treatment; lower utilization of preventive care and services; increased hospitalizations and health care costs and worse health outcomes; and increased mortality (North Carolina Program on Health Literacy, 2011).These inadequacies are not peculiar to the uneducated. It is against this background that this paper has attempted an investigation into health literacy levels among university students. The research thus has the under listed as its objectives.

1.3 Objectives:

The main objective of the study is to examine the effects of health literacy on Sexually Transmitted Infections (STI's) among University of Ghana female Students.

Specific objectives

1. To determine the level of students' knowledge on Sexually Transmitted Infections.
2. To find out the relationship between education and health literacy
3. To identify how sexually transmitted infections are treated among UG female students
4. To determine the influences of health literacy on sexually transmitted infections among University of Ghana female students;

1.4 Research questions

1. Do University of Ghana female students have knowledge on Sexually Transmitted Infections?
2. What is the relationship between education and health literacy?
3. How do female students treat sexually transmitted infections?
4. Does health literacy influence attitudes related to sexually transmitted infections?

1.5 Significance of the study

Low literacy skills have been found to be a stronger predictor of an individual's health status than age, income, employment status, or education level. It also results in poor health outcomes and adds on costs which overburden the Ghanaian economy and health sector. Thus the research would have multiple impacts; on society, the Ghanaian economy, the health sector and the individual.

While the research is aimed at determining the health literacy levels and explaining the relationship between those literacy levels and education for example, it would help the individuals contacted to begin to be more mindful of their health literacy status. The results of the research would immensely benefits policy makers, and health practitioners as well as NGOs to pursue health literacy and design appropriate programmes for the elite in this case. This has positive economic implications in the long run for individuals and the nation in terms of productivity and availability of labour.

Increasing socio-cultural diversity; patients' beliefs and values and perceptions that certain health information is taboo; embarrassment or discomfort to ask questions concerning their health; seeking information from peers rather than health professionals; inability of patients to read and understand health information and so act on it; taking medications wrongly; and complying with medical directions are other motivations for undertaking this research. The result of this would help people to assume a more positive disposition towards their health care practices.

1.6 Scope and limitations of the study

The phenomenon of health literacy is pertinent to every individual in the country. Nonetheless, this study is limited to the confines of the University of Ghana. It will also involve only female students across all age and academic levels. The expanse of the subject matter will cover perception towards STIs, knowledge about health, medication and prevalence of STIs.

The study is limited by time and financial constraints. Another challenge has to do with ethical problems in getting many females students to undergo testing to measure STI prevalence rate. This has proved impossible for preliminary discussions with many female students showed that many were unwilling to undergo such exercise –

an indication of a possible low response rate. The alternative of performing cross sectional studies through the administration of questionnaires in itself is faced with the tendency to collect unreliable and untrue responses from survey participants about their experiences. Education and the assurance of confidentiality were used as tool to curb such tendencies.

1.7 Organization of the study

The thesis is divided into Six chapters. Chapter One deals with the background of the study, statement of the problem, the objective of the study, research questions, scope of the study, relevance of the study, limitations and organisation of the study. Chapter Two reviews literature on literacy and health literacy and STI infection and the relationship between health literacy and STI. Chapter Three discusses the research methodology which includes the type of data used in the analysis, the source of the data, the method of analysis and tools or instruments used in the analysis. It has been structured in such a way as to make replication very easy for any would-be researcher. Chapter Four discusses the results from the data analysis, describing the descriptive statistics and use of central tendency measures and inferential statistics. Chapter Five give discussions and findings, and Chapter Six gives the summary, conclusions and recommendations resulting from the findings of the study.

1.8 Definition of Terms

Health: the general condition of the body or mind, especially in terms of the presence or absence of illnesses, injuries or impairments.

Health care: the provision of medical and related services aimed at maintaining good health, especially through the prevention and treatment of disease.

Literacy: Simply means the ability to read and write or the knowledge or a competence in a subject or area of activity. For the purposes of this thesis health literacy have been defined (chapter two).

Morals: principles of right and wrong as they govern standards of general or sexual behaviour

Moral decadence: a process of decline or decay in society relating to issues of right and wrong and to how individual people should behave

Sexually transmitted infection: a disease that is normally passed from one person to another through sexual activity, e.g. syphilis or genital herpes

LITERATURE REVIEW: CHAPTER TWO

2.0 Introduction

This chapter reviews literature on health literacy and sexually transmitted infections (STI). It expounds on the gender distribution of the spread of STIs, various STIs, rate of spread, as well as control measures. The later sections of the chapter discuses incidence and prevalence of STIs in the light of health literacy levels using empirical studies. Plausible ways of improving health literacy in Ghana are discussed in the last section of the chapter.

2.1 Sexually transmitted infections (STIs)

Sexually transmitted infections (STI) and sexually transmitted diseases (STD) have been used interchangeably. Nonetheless the difference lies in the fact that the latter develops into a systematic condition versus just a symptom (DeRose, 2012). This implies that a person with STI may be infected and may potentially infect others, without showing signs of 'disease'. The World Health Organisation (WHO) have defined Sexually Transmitted Infections as infections that are spread primarily through person-to-person sexual contact (who.int).

The non-absolute nature of the definition suggests that, there are other means of transmission. The National Health Service (NHS) - referring to the four publicly funded healthcare systems in the United Kingdom – specifies that the transmission is through unprotected sex (sex without a condom) and also through genital contact (NHS.2013). Nonetheless, several STIs, in particular HIV and Syphilis, can also be transmitted from mother to child during pregnancy and childbirth, and through blood products and tissue transfer (Small, 2009; WHO, 2011; also cited in Rogstad, 2011).

Given the apparent varied transmission modes of STIs, its name (STI) only seem to take cognisance of the dominant mode of transmission. In fact the causative element of STIs is not the sexual activity, but viral or through a bacteria or parasite. The term veneral disease was the term used to describe STDs before the 1990s for which the nomenclature has changed to STIs in contemporary times. Other associated terminology with the subject is genitourinary medicine (GUM) which is an expending speciality, primarily related to the treatment and prevention of STIs and sexual health (Pattman Sankar, Elawad, Handy and Price, 2010; Sonnex, 1996; Farne Norris-Cervetto, Warbrick-Smith, 2010).

The effects of STI are numerous, having socio-economic, cultural, health, and even political effects. Perhaps, the introductory statement of the World Health Organisation (WHO) report on the Global incidence and prevalence of selected curable sexually transmitted infections for 2008 sums up the effects of STIs: STIs are a major global cause of acute illness, infertility, long-term disability and death with serious medical and psychological consequences of millions of men, women and infants (WHO 2012). This also defines the public health importance of the phenomena.

2.2 Types of STIS

There seem not to be any basic classification of STIs, except for a possible categorisation based on the classes of causative organism. The common groupings of the causative organism are bacteria, protozoa, funga, virus and parasite. There are, however, over 30 bacterial, viral and parasitic pathogens that have been identified to date that can be transmitted sexually (WHO, 2012). Examples of STIs caused by bacteria are Syphilis, Gonorrhoea, Chancroid, Chlamydia, Mycoplasma Genitalium (which is associated with bacterial vaginosis (BV) and Pelvic Inflammatory diseases (PID); causes non-gonococcal urethritis in men) and Lymphogranuloma Venereum

(LGV). Trichomoniasis is a protozoal disease and Candidiasis (yeast infection) is a fungal infection. Some viral infections are HIV infection, Hepatitis A, B, and C, Genital Herpes, Cytomegalovirus, Genital Warts, Mononucleosis, and molluscumcontagiosum. There is also the Human Papillomavirus (HPV) which is viral and has about 70 variants. Parasitic diseases are pubic lice and scabies. STIs common to women are Gonorrhoea, Chancroid, Genital Warts, and Trichomoniasis but syphilis, gonorrhoea and Chlamydia are very common to males with Urethritis (both gonococcal and non gonococccal) also very common among sexually active teenage males (Polin and Ditmar, 2011). HIV/ AIDS which is quite prevalent remains the most dangerous of all STDs common to the sexes and has no cure yet.

2.3 Epidemiology of STIs

The World Health report on Global incidence and prevalence of some selected STIs show that the total number of new cases in 2008 world over for four selected STIs was 498.9 million and 53% (266.1 million) of this incidence were males (WHO 2012). Some adults, however, have multiple infections (WHO, 2012). The study considered four curable STIs namely *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, syphilis and *Trichomonas vaginalis* in adults between 15 and 49 years of age. There were 105.7 million cases of *C. trachomatis*, 106.1 million cases of *N. gonorrhoeae*, 10.6 million cases of syphilis and 276.4 million cases of *T. vaginalis*. The aggregated cases represented 11.3% over the 2005 figure with the dominant change in number of infections from gonorrhoea (21%). In addition, at any point in 2008 it was estimated that 100.4 million adults were infected with *C. trachomatis*, 36.4 million with *N. gonorrhoeae*, 36.4 million with syphilis and 187.0 million with *T. vaginalis.*

In the same report, the incidence of STIs was 92.6 million and the prevalence rate in the Africa Region for *Chlamydia trachomatis*, *Neisseria gonorrhoea* and *Trichomonas vaginalis* was higher for women registering 2.6%, 2.3% and 20.2% respectively though the incidence for the disease (except *Chlamydia trachomatis*) in 2008 was higher for males. Syphilis had a higher incidence (9.4 per thousand as opposed to 8.5 for women) and prevalent rate (3.9%) among males. This trend of prevalence was mirrored in the Americas where there was a higher number (125.7 million) of new infections (out of a total population of 476.9 million of 35 countries) recorded. *Trichomonas vaginalis* was most prevalent (42.8 million). The incidences of the STIs for South East Asia was 78.5 million, Europe – 46.8 million, Eastern Mediterranean – 26.4 million, and Western Pacific – 128.2 million (ibid). The WHO explains that the apparent increase in the STI incidence across the world from 2005 to 2008 was as a result of a number of factors including the increasing number of youths entering the sexually active population each year, social changes that are conducive to the spread of STIs, and changing patterns in prevention and treatment practices.

Furthermore and quite recently, NBC news citing a CDC report mentioned that nearly 20 million new sexually transmitted infections (STIs) occur each year in the United States alone (the grio.com, huffingtonpost.com). This included syphilis, gonorrhoea, hepatitis B, HIV, chlamydia, trichomoniasis, herpes simplex virus type 2 and the most common HPV. The New York Daily news subsequently intimates that STIs are still an epidemic in the United States, a country of a population of about 300 million people. Furthermore, according to the CDC, One-in-three Americans has a sexually transmitted infection. Currently there are about 110 million Americans – approximately one-third of the American population - with an STI (CDC.2013).

While developing countries such as Ghana, due to lack of infrastructure and poor institutional culture, is not able to monitor closely such prevalence and incidence rates, figures as at the end of 2003, show that about 350,000 Ghanaians were living with the STI, HIV/ AIDs out of which over 90% were between 15 – 49 years old. The prevalence rate of curable STIs was 4.6% for syphilis, 31.4% for Trichomoniasis, 33.7% for gonorrhoea, and 10.1 for Chlamydia (UNICEF, UNAIDS and WHO, 2004). But these estimates are only for female sex workers.

2.4 Public health importance of STI

1. There is growing recognition of the public health importance of STIs and STDs because of the degree of morbidity and mortality they cause and the well-established evidence that STDs facilitate the transmission of infection with the human immunodeficiency virus (HIV) (WHO/UNAIDS,1999). From Mayaud and McCormick's (2001) perspective, STIs constitute an important public health problem because of the following reasons:
2. STIs are frequent with high prevalence and incidence;
3. STIs can result in serious complications and sequelae such as infertility in both men and women, ectopic pregnancy, cervical cancer, premature mortality, congenital syphilis and foetal wastage, low birth weight, and prematurity and ophthalmia neonatorum;
4. STIs have social and economic consequences; and
5. A number of STIs have been identified as facilitating the spread of HIV.

With regards to prevalence and spread, WHO (2011) summarises the key facts to be:

- 448 million new infections of curable sexually transmitted (syphilis, gonorrhoea, chlamydia and trichomoniasis) infections occur yearly.
- Some sexually transmitted infections exist without symptoms.

- In pregnant women with untreated early syphilis, 25% of pregnancies result in stillbirth and 14% in neonatal death.

The above facts are the reasons why, STIs would command constant attention for as long it they exist.

2.5 Literacy and Health Literacy

In 1987, Leonard Sagan authored a book called The Health of Nations: true causes of sickness and Wellbeing. He mentioned how he studied historical data collected from 150 countries spanning the gamut from pre-modern to the post-modern societies and ostensibly was searching for the characteristics that would best predict life expectancy. After applying many statistical tests to determine which factors appeared to be causal, he found that by far the most consistently powerful predictor of life expectancy was the prevalence of literacy (Sagan, 1987).

The association of literacy to health abounds in many researches and have been reported repeatedly since such analysis of the post-world war II decline of mortality in developing countries and of mortality differentials within their populations (Grosse and Aufrey, 1989). Going forward there has been numerous articles that portray the importance of health literacy (e.g. Kickbusch, 2001; Kutner, Greenberg, Jin and Paulsen, 2006; Nutbeam, 2008; cdc.gov, nlm.nih.gov, healthliteracy.com). Indeed many studies suggest that understanding the health information could mean the difference between life and death (e.g. Mehrotra and Wagner, 2009; Kimball, 1999). In a study published in the Journal of the American Medical Association – as reported by ABCnews.com - surveyed heart failure patients who had low health literacy were more likely to die outside of a hospital setting than those who were considered health literate. Also, one in five heart failure patients having low health literacy, makes them twice as likely to die from the condition. Studies by Bostock (2012) involving over 7800 adults aged 52 years or more show that poor understanding is associated with

high mortality in older adults. Schillnger, Grumbach, Piette, Wang, Osmond, et al (2002) report in their study that patients with limited health literacy have worse diabetic control. Bennett, Ferreira, Davis, Kaplan, Weinberger, Kuzel et al (1998) have intimated that such patients often present with more advanced diseases, such as prostate cancer. They use fewer preventative services (Scott, Gazmararian, Williams and Baker, 2002) and are up to twice as likely to be hospitalized (Baker, Parker, and Williams, 1998). Evidently there is abundant literature that projects a certain prominence about health literacy. What then is health literacy?

Before delving into definitions, it is perhaps important to highlight the broad link between education and health literacy – purposely to elucidate literacy and subsequently explain health literacy in a complete context. Education and health literacy are not the same but are both important to health status of the people. Health Canada (1999) illuminates this idea. It states that literacy levels, which are usually, but not always related to the levels of education, are important predictors of many important aspects of life including health status (Health Canada, 1999). In fact they are an important predictor of success of a nation (ibid).

Reports from developing countries suggest the positive impact of education and literacy on population, health, and in particular women and children's health (Caldwell, 1986, Bledsoe et al, 1999, Nussbaum, 2000). Evidently, health literacy as a discrete form of literacy is becoming increasingly important for social and economic development. It does not only offer positive health results for the individual but for society and the nation as well. To better demystify the health literacy concept then, the ensuing expounds on the concept of literacy and then discuss the various definition of health literacy and how it can be measured.

The centre for literacy of Quebec submits that:

> 'Literacy involves a complex set of abilities to understand and use the dominant symbol system of a culture for personal and community development. The need and demand for these abilities vary in different societies. In a technological society, the concept is expanding to include the media and electronic text in addition to alphabets and numbers. Individuals must be given life-long learning opportunities to move along a continuum that includes reading, writing, critical understanding and the decision-making abilities they need in their communities. (CLQ, 2000)

This definition relays literacy as a subject that has transversed from the reading, writing and possession of basic numeracy skill to one that reposes complexity, culture, individual empowerment and community development. The Canadian Education Research Information System identifies six literacy skills that is needed for an adult to function in society (CERIS, 1999). They are quantitative literacy, scientific literacy, technological literacy, cultural literacy, media literacy and computer literacy. Whiles health literacy is missing from this list, the various elements (of the list) are important for a successful health literacy drive. In relation to the definition by CERIS, Verhoeven (1994) discusses functional literacy – a term first used in the 1940 US census and subsequently as a measurement objective in the 1992 NAAL survey (Guzetti, Alvermann and Johns, 2002) – which was motivated by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) concern to streamline the teaching of literacy in developing countries which hitherto focused solely on skills and needed a greater focus on practices. Thus, literacy instruction consistent with the approach of teaching literacy as a function as a functional skill describes functional literacy (Comings, Garner and Smith, 2007). UNESCO defines functional literacy as the level of skill needed to function fully in society in international discussions. Jarvis

(1999) defines it the same way for adult education settings. Collins and O'Brien (2003) provides the same definition but offers an alternative that sees functional literacy as the minimum needed to meet personal and social needs in general education. Hence, one is functionally illiterate if his reading and writing skill, so to say are inadequate. This contrasts with illiteracy but within a context, possibly illustrated by a situation where foreigners who cannot read or write in a native language where they live would be considered functionally illiterate.

Another set of authors, from the time of Freire (1985) who introduced the model of adult learning, make submissions that seem to emphasise more on the community development rather than literacy being an individual *business*. This is actually fundamental to the health literacy debate that has emerged from two different sources: the community development approaches around the Freirean model of adult learning (Friere, 1985, Friere and Macedo, 1987) which is linked to empowerment and applied in the latin American context (Wallerstein and Bernstein, 1994) and the second describes an approach that arose out of a concern over the poor health literacy levels of large numbers of patients in the American health care system (Parker, 2000, Pfizer, 1998). Flowing from the previous paragraphs, these two motivations are essential for constructing a holistic health literacy paradigm.

A functional definition of health literacy from the Centre for Health Care Strategies Inc. describes health literacy as the ability to read, understand, and act on health care information (Centre for Health Care Strategies Inc, 2000). This short definition espouses the main ideas in the longer definition of the National Assessment of Adult Literacy (NAAL). The NAAL defines health literacy as 'the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions (National centre

for education statistics, 2013; US Department of Health and Human Services, 2000). Health literacy also involves making sound health decisions in the context of everyday life at home, in the community, at the workplace, in the health care system, the marketplace and the political arena to enable people exert 'control over their health', 'seek out information' and assume responsibility (Kickbusch Wait and Maag., 2005, p. 8). These definitions focus on the ability to understand and use health-related printed information in daily activities at home, at work, and in the community to achieve one's goals and to develop one's knowledge and potential. It is more than 'medical literacy' which involves the ability to read, understand and act on instructions for taking a cholesterol-lowering drug for example (Peerson and Saunders, 2009). Health literacy in this instance would involve the ability to access information about cholesterol, to understand it and to apply it to one's own life (ibid).

A final definition from Sorenson (2011) offers a more progressive outlook of health literacy: 'Health literacy entails people's knowledge, motivation and competences to access, understand, appraise and apply information to form judgments and take decisions in everyday life in terms of healthcare, disease prevention and health promotion to improve quality of life during the life course'. This definition espouses an important subject of public health – health promotion – giving an indication of the need to find ways of improving health continuously.

2.6 Determinants of health literacy

a. Education

Studies have shown that adults with decreased Health literacy are more likely to have less education (Kirsch, Jungeblut, Jenkins, & Kolstad, 2002). In truth, the association between education and health is well established and is robust across health conditions and outcomes (Backlund, Sorlie and Johnson, 1999; Sorlie, Backlund and

Keller, 1995; Adler and Newman, 2002; Huisman, Kunst, Bopp, Borgan, Borrell, Costa et al, 2005; Marmot, 2002). In a more profound way, Schillinger, Barton, Karter, Wang and Adler (2006) show the importance of literacy while recognising the importance of education as they use education as the main input factor in their study. In their work, they used literacy as a mediating factor between educational attainment and glycemic control (HbA1c) in a second model where the first model did not make use of the literacy mediating factor. Results showed that the mediational model (which includes literacy) was a significant improvement with the additional path from literacy to HbA1c reducing the discrepancy from observed data, making the direct relationship between education and HbA1c fall to a non-significant threshold. This analytic approach succeeds in factoring out the impact of literacy rather than churning out results based on intuitive, or educated guesses and mere conjecturers or a situation where the effect of literacy is confounded in a model that makes use of education.

These suggest unequivocally that one of the major important components of health literacy is education, for education is a function of the literacy of a person. However, it must be quickly pointed out that health literacy may not be related to years of education or general reading ability (National Network of Libraries of Medicine, 2012) suggesting the creation of a knowledge gap. The knowledge gap can actually extend from childhood through parenthood (Sanders, Shaw, Guez, Baur, & Rudd, 2009). Consequently, a person who functions adequately at home or work may have marginal or inadequate literacy in a health care environment. Going forward, NAALS (2006) categorises literacy in four different cohorts, namely the below basic, basic, intermediary and proficiency.

Below Basic: locating easily identifiable information in short prose texts and documents; locating numbers and performing simple arithmetic functions

Basic: reading and understanding information in simple prose and documents; solving one-step arithmetic problems when the operation is specified or easily inferred.

Intermediate - reading and understanding moderately dense prose texts and making simple inferences from text; reading information from documents and making inferences; solving arithmetic problems in prose texts and documents when the operation is not specified or easily inferred.

Proficient - reading more lengthy and complex prose text and synthesizing information; integrating, synthesizing, and analyzing multiple pieces of information from more complex documents; using more abstract information from prose texts and documents to solve multistep problems when arithmetic operations are not easily inferred. (Kutner, Greenberg, Jin and Paulsen, 2006).

In the NAAL Health literacy report, *The Health Literacy of America's Adults: Results From the 2003 National Assessment of Adult Literacy*, results are reported in terms of the above four literacy performance levels - Below Basic, Basic, Intermediate, and Proficient, that:

> Some 49 percent of adults who had never attended or did not complete high school had *Below Basic* health literacy, compared with 15 percent of adults who ended their education with a high school diploma and 3 percent of adults with a bachelor's degree

b. Economic factors

Health literacy cannot be delinked from poverty. This is because literacy as has been explored in the above literature is a function of formal education. The percentage of Sub-Saharan Africans who survive on $1.25 a day was 53% as at 2009. This actually

represented a significant decline from the 1999 figure of 58%. With an increasing population estimated at 20 million per year and a fertility rate of 5.1 lifetime births per woman (a very fertility rate), if the level of education does not improve, the region will have to contend with greater problems of reproductive health among other things. Already, within the past twenty years of regional population growth of about 3% per year which has outpaced economic gains, has seen the region become poorer by about 22% more than they were in the 1970s (UNPF & PFB .2010). In developed countries, the level of functional literacy of an individual is proportional to income level and risk of committing a crime. According to the National Centre for Educational Statistics in the United States (2006)

> 43% of adults at the lowest level of literacy lived below the poverty line, as opposed to 4% of those with the highest levels of literacy, in other words, adults living below the poverty level had lower average health literacy than adults living above the poverty threshold (Kutner et al, 2006)

In relation to occupation types, the health literacy scores were highest for those in professional and related fields; followed by management/business/financial office and administrative support; sales and related occupation; and then Installation, maintenance, and repair; service, production, transportation and material moving with farming, fishing and forestry coming last (ibid, p.48).

These results show that poverty, which is also linked to the type of occupation are associated with low literacy levels. It suffices that advancement in the economic life of people can improve their health literacy levels.

c. Culture

Cultural and language differences and socioeconomic status interact with and contribute to low health literacy (Shaw, Huebner, Armin, Orzech and Vivian, 2008).

In fact cultural beliefs around health and illness contribute to an individual's ability to understand and act on a health care provider's instructions. Usually, health providers are often unable to recognize, however, when cultural differences between patient and provider contribute to misunderstandings around chronic disease management, health status, disease severity, and treatment regimens. Perhaps, the lack of correlation between education or adulthood (age) and health literacy can explain the differences in cultural orientation of care providers and patients. Gausman and Forman (2002) report that elderly patients in an affluent retirement centre reported low health literacy on the Test of Functional Health Literacy (TOFHL). Kalichman, Ramachandran, and Catz (1999) report that education and health literacy were significant independent predictors of medication adherence among a community sample of 182 HIV-seropositive participants. This led Shaw et al (2008) to consider the possibility that the patient's ability to comprehend her physician's instructions is shaped by cultural factors that extend beyond literacy or education. Hoang and Erickson (1985) identify some cultural barriers to care to be language, religious beliefs, family ties, interactional styles, gender norms, and misconceptions about Western medicine. Shaw et al (2008) on the other hand mentions disease etiology, appropriate treatments, proper self-care and preventive treatment, human physiology, and appropriate doctor and patient conduct, noting that cultural differences even influence perceptions of symptoms and emotional states. Lannin et al. (1998) in this light have shown that beliefs about cancer and its treatment may affect patients' willingness to seek screening tests and professional care. Again Uppaluri, Schumm and Lauderdale (2001) found that recent Asian immigrants were less likely than whites to report stress over a 2-week period, while Asian immigrants who had been in the United States for at least 15 years reported higher levels of stress. This suggests cultural influences on

the perception of ‘‘stress’’ that change as immigrants become acculturated to American lifestyles. Clearly, since cultural beliefs around health and illness are an integral part of a patient’s ability to understand and act on his or her doctor’s instructions, efforts to improve health literacy that fail to consider these beliefs are unlikely to fully address the needs of those populations suffering from the highest levels of low health literacy (Shaw et al, 2008).

2.7 The building blocks of health literacy

There is almost unanimous consensus that goals of health literacy can be achieved if every entity and stakeholder puts its hand to the plough. It will therefore involve government agencies and health professional, corporate entities, adult educators and literacy practitioners, community based organisations, groups at low risk for low health literacy, educators and health communicators, the academic community, health care facilities, faith based organisations, the media, the general public and individual efforts. Many researches have shown the importance of education as a transmission mechanism of literacy to engage health literacy successfully. Sorenson (2011) also discusses the importance of health literacy as part of corporate social responsibility. This is seen as an important step in projecting which ever literacy level an individual might have attained, and in fact practicalising the literacy about health. Sorenson also mentions the conduct of needs assessment, and provision of quality programmes and activities that match needs of people. According to Mitic and Rootman (2012), three fundamental approaches deemed essential for the development of a comprehensive strategy for improving health literacy are (1) developing knowledge, (2) Raising awareness and building capacity and (3) building infrastructure and partnerships. These are briefly presented but adapted to general situation other than the Canadian context, in which the paper specifically addressed.

Develop Knowledge:

This entails developing and facilitating an extensive knowledge base that provides access to research and practice-based evidence on effective ways to improve health literacy. The continuum of activities under this component includes gathering and translating (as required) all pertinent research and literature; documenting and evaluating community health literacy initiatives; analysing and synthesizing the gathered information; and making the resulting body of knowledge available to all stakeholders in a form that will be of the most practical use to them. (Public Health Agency of Canada, 2003). Knowledge development is essential for "evidence and practice-based decision making," for the development of promising practices in health literacy, and for the identification of core competencies for health literacy (e.g. computer literacy skills which allow for the critical analysis of information especially among older adults). Integral to developing knowledge is the development of a research and evaluation agenda that allows for expanding what is currently known about health literacy. Three research areas might require some attention: research on the determinants of health literacy (e.g. What determines low and high health literacy - among individuals as well as health professionals?); research on the distribution of health literacy in the population (e.g. In which jurisdictions are low and high health literacy more prevalent?); and evaluation of interventions that address low health literacy (e.g. How can low health literacy be improved?).

Raise Awareness and Build Capacity:

1. This component entails developing and providing learning opportunities that enhance the knowledge, understanding and abilities of the public and private sector workforce, professionals and community members in their efforts to support and promote integrated health literacy. This includes the development

and implementation of health communication strategies that capture the attention of key stakeholders and convey the importance of health literacy. The targeted stakeholder includes government personnel, current providers, associated professionals, and individuals in training (at universities, community colleges, certificate programs, etc.). On the other hand, some health communication strategies may include interpersonal communication, public education and awareness, media relations/advocacy, health journalism, stakeholder relations, risk communication, public information, and social marketing (e.g. point-of-purchase health information such as nutritional labelling in stores and restaurants/food services Mitic and Rootman (2012) these are aspects of health communication. The Centre for Disease Control and Prevention (CDC) of the United States gives a detailed view of health communication. It describes health communication as 'the study and use of communication strategies to inform and influence individual decisions that enhance health' and the strategic planning to achieve that is some variation for the following steps:

2. Review background information to define the problem (What's out there?)
3. Set communication objectives (What do we want to accomplish?)
4. Analyse and segment target audiences (Who do we want to reach?)
5. Develop and pretest message concepts (What do we want to say?)
6. Select communication channels (Where do we want to say it?)
7. Select, create and pretest messages and products (How do we want to say it?)
8. Develop promotion plan/production (How do we get it used?)
9. Implement communication strategies and conduct process evaluation (Getting it out there)

10. Conduct outcome and impact evaluation (How well did we do?)

Mitic and Rootman (2012) additionally underscores the importance of information and communication technology (ICT) and social media in achieving the health literacy. ICT now makes it possible to distribute information in ways that are inexpensive; instantly, widely and easily accessible; and potentially creative and entertaining. Nonetheless, as advised by the CDC, mechanisms should be tailored to be apt for the people given the state of development of the people.

Build Infrastructure and Partnerships:

The above two components are quite dependent on infrastructure and institutional arrangements in the country. To build infrastructure and partnerships involves the allocation of sufficient fiscal, human, organizational and physical resources to support and sustain a coordinated effort to build the partnerships and implement the activities outlined in the approach to improving health literacy. Mitic and Rootman (2012) make reference to the fact that Throughout Canada many individuals, organizations, communities and municipalities are engaged in improving health literacy by forming partnerships or coalitions. One province, British Columbia, has established a Health Literacy Network. This 'network of networks' brings together representatives from different sectors: government, not-for-profit, and community organizations from the health and literacy sectors, who represent a variety of stakeholders including immigrants, seniors, low literacy adults, patients, and mental health clients. This is an example of a coordinated effort of stakeholders to curb health illiteracy so to speak. It would be important to identify where there are deficits in health literacy and define the structure of those deficits in order to offer cutting edge solutions.

To make the foregoing practicable, stakeholders are required to take action. Each stakeholder, given his jurisdiction, opportunities and strengths can contribute his

quota. For example, governments can raise the levels of knowledge and literacy to the point where individuals can 1) make informed personal and family health-related choices, and 2) take an active role in bringing about change in the environments for the benefit of their health (Nutbeam, Wise, Bauman, Harris and Leeder, 1993). This can be make possibly partly through some formal education and a focused health literacy programme. As a second example, the business community can also enhance their corporate social responsibility by rolling out health literacy programmes to improve upon the health of the workforce. The aspects of education and corporate social responsibility are highlighted below. Nonetheless, the above components for health literacy seem consider all types of stakeholders except the efforts of the individual to improve his health literacy.

Education

Health researchers and health care professionals from both the advanced and developing countries have long been concerned about the link between health and education (World Bank, 2000; Health Canada, 1999; Evans, Barer and Marmor, 1994). Education and literacy have in fact been ranked as key determinants of health. Nutbeam has proposed a three-level hierarchy in health literacy: basic/functional literacy (basic skills in reading and writing); communication/interactive literacy (social skills that allow active participation in health care); and critical literacy (the ability to critically analyse and use information to participate in actions conducive to health) (Nutbeam, 2000). He argues that achieving the level of critical literacy 'allows for greater autonomy and personal empowerment'. While this is also an important goal of school education, schools are about maximizing the educational outcomes for students. It is thus important to point out that the core business of schools is education and their level of expertise in health issues is minimal. Yet research clearly shows

there are strong links between poor health and educational achievement (Lavin Shapiro and Weill., 1992; Devaney, Schochet, Thornton, Fasciano, and Gavin, 1993; Igoe, 1993; World Bank, 1993; WHO, 1996). Schools, and the education sector in general, have begun to recognize these links and embrace the concept of a whole school approach in addressing health and social issues, which will assist them in maximizing learning outcomes (Allensworth, 1993; Cameron and McBride, 1995; WHO, 1996; St Leger and Nutbeam, 2000). The approach is often called the 'health promoting school', or in the USA, 'co-ordinated school health'. In many parts of Africa and for example in Ghana, subjects such life skill, which incorporates topics on nutrition and nature, causes, spread and prevention of diseases are taught. Additionally, the establishment of first aid clubs which is common at the primary education level also help to teach health literacy. At the senior high level, while there is no clear evidence that health literacy is enhanced across subject or discipline divides, it is not erroneous to conclude that the level of health literacy is minimal.

In order to use formal education as constructive tool for health literacy, Marks notes some health literacy related skill that are known to be impacted through well-coordinated comprehensive classroom and /or experiential educational approaches. They are:

1. Ability to access valid sources of information, products, and services
2. Ability to analyse factors that influence responsible health decisions
3. Ability to make sound choices and set health-affirming goals based on these decisions
4. Ability to communicate with others
5. Ability to read and understand health information
6. Ability to use health information in health enhancing ways

7. Ability to advocate
8. Ability to weigh the validity of health claims (p. 44)

Taking particular note of the present continues verbs - access, analyse, make sound choices, communicate, read and understand, use, advocate and weigh - in each of the stipulated skill above show the underlying skills that formal education is supposed to give people. Kanj and Mitic (2009) in their presentation of the working document for discussion at the 7th Global Conference on Health Promotion, "Promoting Health and Development: Closing the Implementation Gap", Nairobi, Kenya categorise research findings according to four these verbs – access, understand, weigh, and communicate – which they labelled components. For them various efforts put into enhancing health literacy fell into any of these categories. However, Marks advocates for an exhaustive use of all these components to make a holistic health literacy status. Marks further mentions that because health issues today are predominantly lifestyle related and paediatricians are aware of health literacy – related problems and the need for good communication with families, but struggle with time demands to implement these skills (Turner, et al., 2009) educating children to make healthy life choices through the teaching of age-appropriate health lessons as a component of formal education. This promises to improve students' ability to access interpret health information as an important step in the process of achieving wellness, and fostering academic ability (St. Leger, 2001; Wharf Higgins, Begoray and MacDonald, 2009). Basic literacy and numeracy skills can be used to enhance health literacy through school – based strategies (ibid), including how to solve problems and arrive at critical decisions. DeWalt and Hink (2009) also submits owing to the situation where many school aged children may have cognitive, social and emotional challenges, that impact health, a school should be well poised to assist children with a special health-care requirement

to develop health knowledge and self-care skills so that they can become effective independent self –managers. These strategies underline the importance of the educational system, which is one of three key points of interventions deemed necessary to develop a health literate society (Institute of Medicine, 2004), adding that the educational system is key among the system factors.

Corporate social responsibility

Sorensen (2011) discusses health literacy as an outcome of corporate DNA, using CSR Europe as case study and involving multinational companies such as MSD, Nestle, Microsoft, Edenred, and Maastricht University. She submits that Health literacy as outcome of the corporate DNA can be seen as an important building block to boost knowledge, motivation and competences of the employees to make qualified suitable and realistic decisions in terms of one's own health. Her findings portray that only a few companies have strategically integrated the investment in health for employees into their business model and provide a broad sustainable basis for advancing health literacy and health outcomes. The results showed that there were no companies with 'health literacy' labelled activities; however every company did have health programmes. The common health activities concerned safety, prevention or health promotion focusing mainly on physical activity, diet, smoking cessation, health check-ups and stress management. This type of action assumed by firms are labelled 'demand reduction' by Fries et al (1993). O'Donnell (2001) presents an argument in favour of this strategy, noting that if 'employees' health improvement programmes are to be cost effective, increasing the employee's role in disease management will be imperative' (p.587). He had noted that 'demand management' programmes were reportedly achieving 7-17% lower utilization rates associated with patient disease management instruction, self-care education, or nurse-based phone counselling

interventions. The theory on 'health belief' model, an interpersonal behaviour theory, are operational in demand management oriented programmes and assert that if people are educated about their personal susceptibility to health problems, they will be motivated to become more involved in self-management of their conditions. This is a tool that companies could perhaps exploit though it might mean a diversion of scarce resource from primary prevention education (Friedman, 1993). There is the need for a shift in mind set to incorporate health literacy, health and well-being of employees as a core priority and settled value within the companies' business model and not only as add-on projects for consumers, employees and other stakeholders. As a strategic corporate responsibility involves a systemic manner of integrating health and well-being to business structures and activities. To strengthen coherence it would be essential to have a guiding corporate vision and mission and stimulate local adaptation depending on local ethical, social, political and cultural values. This approach is necessary as the workplace - where most workers spend most of their productive time – a better place for people to learn from each other's tribulations and could represent an element of remuneration.

Individual effort

The institute of Medicine has said that Health literacy is a shared function of social and individual factors, and observes that individuals' health literacy skills and capacities are mediated by their education, culture, and language. Indeed, the term health literacy has been frequently used to focus on the skills of the individual alone (Harvard school of Public health, 2013). EuroHealthNet (2005) mentions how ICT skills could enhance health literacy, noting that ICT skills are essential to the individual's development in a knowledge based society and very important for vulnerable groups. They outline modular trainings and areas that people might need to

concentrate on in acquiring ICT/internet skills. Other important factors has to do with personal motivation. The individual should be interested in improving in improving his or her own living conditions and have a sense of responsibility towards their health conditions. Perhaps this is the most important task for each individual.

2.8 Importance of health literacy

There is no gainsaying that health literacy is very important. The above reviews point to the fact the health literacy has immense public health important and inure greater benefit to the socio-economic status of the economy. Kutner (2006) describes the importance of health literacy in relation to the individual. He mentions that health literacy affects people's ability to:

- Navigate the healthcare system, including locating services and filling out forms
- Share health information with providers
- Engage in self-care and chronic disease management
- Adopt health promoting behaviours, such as exercising and eating a healthy diet
- Act on health related news and announcements

Pointing out that some of the health outcomes would probably be the avoidance of the situation where persons with limited literacy skills have (1) higher use of treatment services such as hospitalization and emergency services, (2) lower use of preventive services, (3) higher use of treatment services results in higher healthcare costs.

2.9 Health Literacy Rates

While statistics on health literacy rates are limited (they are available for United States, Canada and quite limited evidence based figures in Australi), statistics on

health literacy rates show that, health literacy levels are very low worldwide in spite of economic advancement. For example, in an advanced country such as the United States of America, about 50% of all adults "have difficulties understanding and acting upon health information" (IOM, 2004). Additionally, 65% of young people, aged 16-24 have difficulty reading and processing everyday health information (Kansas Head Start Association, 2012) while with adults, the following statistics on associated with health literacy holds:

71% of adults older than age 60 have difficulty using print materials

80% have difficulty using documents such as forms or charts

68% have difficulty interpreting numbers and performing calculations

Generally, two-thirds of the older people are unable to understand the information given to them about their prescription medications.

In Australia, 60% of the population scored below a level regarded as optimal for health maintenance in a 2006 report (Australia Bureau of Statistics, 2006). A similar estimate of Canadians are believed to possess low health literacy rates according to In the light of these rates, the annual ministerial review of the United Nations Economic and Social Council (ECOSOC) found that low health literacy may well be more prevalent in many low and middle income countries (ECOSOC Annual Ministerial Review, 2009).

It is evident that graduating from high school is no longer sufficient to guarantee an adult will be able to read materials at a 12th grade level, even though most health materials are written above the 8th grade level (Ferguson and Pawlak, 2011). This basic literacy problem – occurring during school years persist throughout an adolescent's lifetime (e.g. Fletcher, Shaywitz, Shankweiler, Katz, Liberman, Stuebing

et al, 1994) and are related to broad health issues such as delinquency (e.g. Waldie and Spreen, 1993) homelessness (e.g. Barwick and Siegel, 1996), loneliness (Sabornie, 1994), substance abuse (e.g. Beitchman, Wilson and Douglass, 2001) and suicide (e.g. McBride and Siegel, 1997), in addition to poor physical and mental health (Gans, Kenny, and Ghany 2003; Rootman and Ronson, 2005). Marks (2012) mentions that the situation is even more prevalent among schools that do not provide basic health literacy development in a consistent manner.

According to a report released by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) in 2007, the countries of South and South-West Asia have the highest number of illiterate adults in the world: an estimated 388 million. While literacy rates in Central Asia are not as high, the gender gap is of concern, as 72.5 per cent of the illiterate population are women

Statistics on health literacy rates by gender in the United States show that the average health literacy score for women was 6 points higher than the average health literacy score for men (National Centre for Education Statistics, 2003). In Australia, more women (48%) than men (43%) achieved an overall score of level 3 or above in health literacy measurement and additionally, women had a higher score in prose and health literacy, while men had higher scores for documentary literacy and numeracy (Australia Bureau of Statistics, 2006).

2.10 Health literacy and STIs among females

There is limited research that explores the relationship between health literacy and sexually transmitted infections. Nonetheless, it is common knowledge that most STIs result from unprotected intercourse, which is, in the majority of cases, a voluntary behaviour. A framework by Paasche-Orlow and Wolfs (2007), which perhaps could explain this voluntary behaviour analyses the effect of health literacy on health

outcomes, describing a pathway between health literacy and health outcomes of which self-care is one area. It is intuitive to focus on self-care since health literacy outcomes come only become evident in the individual's ability and willingness to take care of himself first and of course of other health situations in the environment in which he/she lives. It suffices that in order to illustrate the linkage between health literacy and STI prevalence, the possibility exists that health literacy impacts STI knowledge, which in turn impacts the health outcome of engaging in protected intercourse. This could be translated to mean that females (and males) may lack knowledge of STIs, due to their low health literacy, and, as a result, this group may engage in unprotected intercourse, thus increasing risk of STIs.

Perhaps the only study that is directly related to STI prevalence and health literacy is that by Nancy (2011). Using a sample of 300 females, she found that health literacy predicted STI knowledge and STI testing whereas STI knowledge predicted health protective sexual communication and STI testing. Neither health literacy nor STI knowledge predicted history of a STI or the behaviour of condom use. Related studies have only looked at the relationship between lower health literacy and less knowledge of HIV/AIDS (e.g. Barragan, Hicks, Franco- Paredes, Williams, & Del Rio, 2006; Kalichman & Rompa, 2000; Rutherford, Holman and MacDonald et al., 2006). In Rutherford et al.'s (2006) study which took place in the United Kingdom and involved 505 females under age 35, health literacy was found to be significantly associated with sexual health knowledge. Another study by Fortenberry et al. (2001) only explored the relationship between health literacy and gonorrhoea screening. Results showed that there was a significant relationship between health literacy and the behaviour of screening for gonorrhoea. Finally studies by Needham, Wiemann, Tortolero and Chacko (2006) showed that young women at a reproductive health

clinic with a higher health literacy demonstrated better comprehension of STI – related information.

Clearly, the above studies, though scanty are all concentrated in the western and European countries, there is virtually no information on the relationship of STIs and health literacy in the sub-region. Nonetheless, indicators on health in the subregion might give an idea of how health literacy level could possibly affect STIs. Indicators in the sub-region show that the prevalence rate of contraceptive use (of any method) is 23% with use of modern methods being 17%. Thirty-six percent of adolescent women aged between 15 and 19 years have already begun childbearing while the HIV/AIDS prevalence rate of females, 15 – 24 years, is 3.5% as against 1.2% for males within that same age group.

In relation to health literacy, it is possible that many youth may be disadvantaged as the secondary school enrolment for male population of school going age is 35 and 28 for the equivalent female population. This is a drastic reduction from the primary school enrolment for male population of school going age which is about 108 and 100 for females. This culminates in a gender parity index of 90 for net primary enrolment and 77 for net secondary enrolment. In Ghana in 2009, the net percent of female school age population for secondary school enrolment was 43 while the contraceptive prevalence rate for women between ages 15 and 49 was 24%. This however falls short of the objective to increase contraceptive prevalence rate from 13.1% (DHS 1998) to 28% by 2010 (National Population policy, 1994). Further descriptive statistics show that the total fertility rate (TFR) among highly educated women - 15-49 years – was 2.5 as opposed to 6.0 for women with low education. The TFR for the poorest was 6.4 but was far low, 2.8, for the richest quintile. This suggests the impact of education and economic status on reproductive health of the women. It also suggests how an

improved economy and increased access to education (including higher education) can help improve sexual health literacy.

2.11 Measuring Health Literacy

There has been attempts during the last three decades to produce tests of health literacy. In 1993, (Davis, Long, Jackson, Mayeaux, George et al (1993) created the Rapid Estimate of Adult Literacy of Medicine (REALM). Parker, Baker, Williams and Nurss (1995) followed with the creation of the Test for Functional Health Literacy in Adults (TOFHLA) in 1995. Baker, Williams, Parker, Gazmararian and Nurss (1999) developed a shorter version of the TOFHLA, called the S-TOFHLA. These tests could be utilised in a health care setting or with health-related vocabulary. The Health Activities Literacy Scale (HALS) was developed later and used in 2004 (Rudd, Kirsch and Yamamota, 2004) where the USA Educational and Testing Service (ETS) report - Literacy and Health in America - the first research paper to analyse population-based health literacy skills among adults. Weiss, Mays, Martz, Castro, DeWalt, Pignone et al (2005) developed the Newest Vital Sign.

REALM

A patient's literacy level can easily be measured in about two minutes with an instrument called the Rapid Estimate of Adult Literacy in Medicine (REALM) (Davis, Long, Jackson, Mayeaux, George, Murphy et al (1993). The REALM is a word recognition test, in which subjects read from a list of 66 medical words arranged in order of complexity by the number of syllables and pronunciation difficulty. Patients are asked to read aloud as many words as they can, beginning with the first word and continuing through the list as far as possible until they reach words they cannot pronounce correctly. The REALM yields a score that estimates a patient's reading level (ie, grades 0–3, grades 4–6, grades 7–8, grade 9 and above). Patients who score

in grades 0–3 and 4–6 have literacy skills that correspond approximately to NALS levels 1 and 2, respectively. Because the REALM uses medical words, the test provides not just an assessment of general reading skills, but also an indication of the individual's health literacy. The main limitations of the REALM are that it is available only in English and that it tests word recognition, not reading comprehension.

TOFHLA

The Test of Functional Health Literacy in Adults (TOFHLA), which is available in both English and Spanish (Parker, Baker, Williams, and Nurss, 1995), is widely used in health literacy research. The TOFHLA provides patients with medical information or instructions (eg, instructions on a prescription label or instructions for preparing for a diagnostic procedure). Patients then respond by answering questions that test their understanding of the information or instructions they have received. Scores on the TOFHLA categorize patients into those with low, marginal, or adequate health literacy skills. The TOFHLA takes longer to administer than the REALM. According to Baker, Williams, Gazmararian and Nurss (1999), the TOFHLA takes about 22 minutes to complete and have developed a shorter version called the S-TOFHLA, which takes about 12 minutes to complete.

2.12 Conclusion

The World Health Organisation (WHO) defines Sexually Transmitted Infections as infections that are spread primarily through person-to-person sexual contact. However, some STIs such as HIV and Syphilis can also be transmitted from mother to child during pregnancy and childbirth, and through blood products and tissue transfer. There are many STIs and statistics show that the total number of new cases in 2008 world over for four selected STIs

was 498.9 million and 53% (266.1 million) of this incidence were males. The prevalence rate in the Africa Region for Chlamydia trachomatis, Neisseria gonorrhoea and trichomonas vaginalis was higher for women registering 2.6%, 2.3% and 20.2% respectively for the named diseases even though the incidence for the disease (except Chlamydia trachomatis) in 2008 was higher for males. The prevalence rate represents 92.6 million cases. One of the tools known to curn STI is education, and especially health literacy. Many scholars and global agencies have suggested that there is a link between education, health literacy and health outcomes. Kutner (2006) describes the importance of health literacy in relation to the individual and notes that it affects people's ability to (1) navigate the healthcare system, including locating services and filling out forms; (2) share health information with providers; engage in self-care and chronic disease management; (3) adopt health promoting behaviours, such as exercising and eating a healthy diet and (4) act on health related news and announcements. The known measuring instruments for health literacy are and a shorter version called S-TOFHLA by Parker et al (1995). Other measures are the Health Activities Literacy Scale (HALS).

METHODOLOGY : CHAPTER THREE

3.0 Introduction

This chapter describes the methodology of the study. It presents the research methodology and design, population, sample and sampling design, the data collection protocol and techniques of analysis of data. Issues of validity and reliability are also discussed and test output of reliability of the constructs used in the study, following pretesting, is also presented.

3.1 Research Design

The research design is a strategy of enquiry, which moves from the underlying assumptions of methods and data collection (Myers, 2009). Research design "deals with a logical problem and not a logistical problem" (Yin, 1989, p. 29). It has been referred to as "a master plan specifying the methods and procedures" (Zikmund 1991; p.42), and the "detailed plan which you will use to guide and focus your research" (Hussey & Hussey, 1997; p.114). Thus, it is concerned with why a researcher collects certain data, what data are collected, where the data are collected and how these will be analysed to answer the research question. It also involves the selection and application of appropriate designs for quantitative and qualitative research. It basically underpins theories and relates to the application of either a quantitative or qualitative design to inform a study. Guarded by the foregoing, a cross-sectional study using the survey approach to research was adopted for the study.

3.2 The Survey Approach

Medical researchers usually employ surveys to study the spread, patterns and trend of diseases and observation of health systems over time. Opinion polls make use of survey methodology to produce objective results. Essentially such exercise mainly

involve the admittance of a fair representation of the population into the sample, and subjects of investigation usually give an over view of the situation with a particular phenomenon, rather than an in-depth description of the situation. This study employs the survey method which is a cross-sectional study, because in order to find out about the health literacy rates and the attitudes towards sexually treatment diseases, treatment modes, among others, a cross – section of students, large enough, need to be involved.

Studies by the World Health Organisation (WHO) (2012) to measure the global incidence and prevalence of selected STIs used surveys. In the National Adult Literacy Survey (NALS) in the US, where the literacy rates are measured, a survey approach is used (Kirsch, Jungeblut, Jenkins, et al (2002). These big studies, among many others all used the survey approach basically because the studies involved large numbers. Nonetheless, in studies where the systematic inherent selection criteria, does not easily allow the randomisation that comes with a survey; the selection process more or less is based on whether the person consented to participate or not after the entire population of interest was considered. For example, in the study of Schillinger, Barton, Karter, Wang and Alder (2006), in which sought to determine whether literacy mediates the relationship between education and glycemic control among diabetes patients; they included all participants that qualified per their criteria. Their criteria included (1) having satisfied a certain maximum number of visits to one of two specific primary care facility within the past 12 months, (2) had at least one visit to a primary care physician in the prior six months, (3) had a recorded hemoglobin A1c (HbA1c) in the database, (5) age restriction, (6) language, (7) had type two diabetes as determined by a billing code and (8) finally certain patients with certain medical complications were excluded from the study. In such a study, the eligible

participants were relatively few. Rather than sampling immediately through a random process, ethical consideration of voluntary participation was applied to narrow the number down.

This study may not have many of such restrictions. For example, while it may be difficult to determine which students have ever had STIs or have the disease, the attitude towards STIs which amounts to risk aversive-ness for the disease is considered and prioritised. This element is central to the study as the latter concept only limits the study to one that examines health literacy influences on treating STIs and subsequently attitude towards such infections which actually provides some depth.

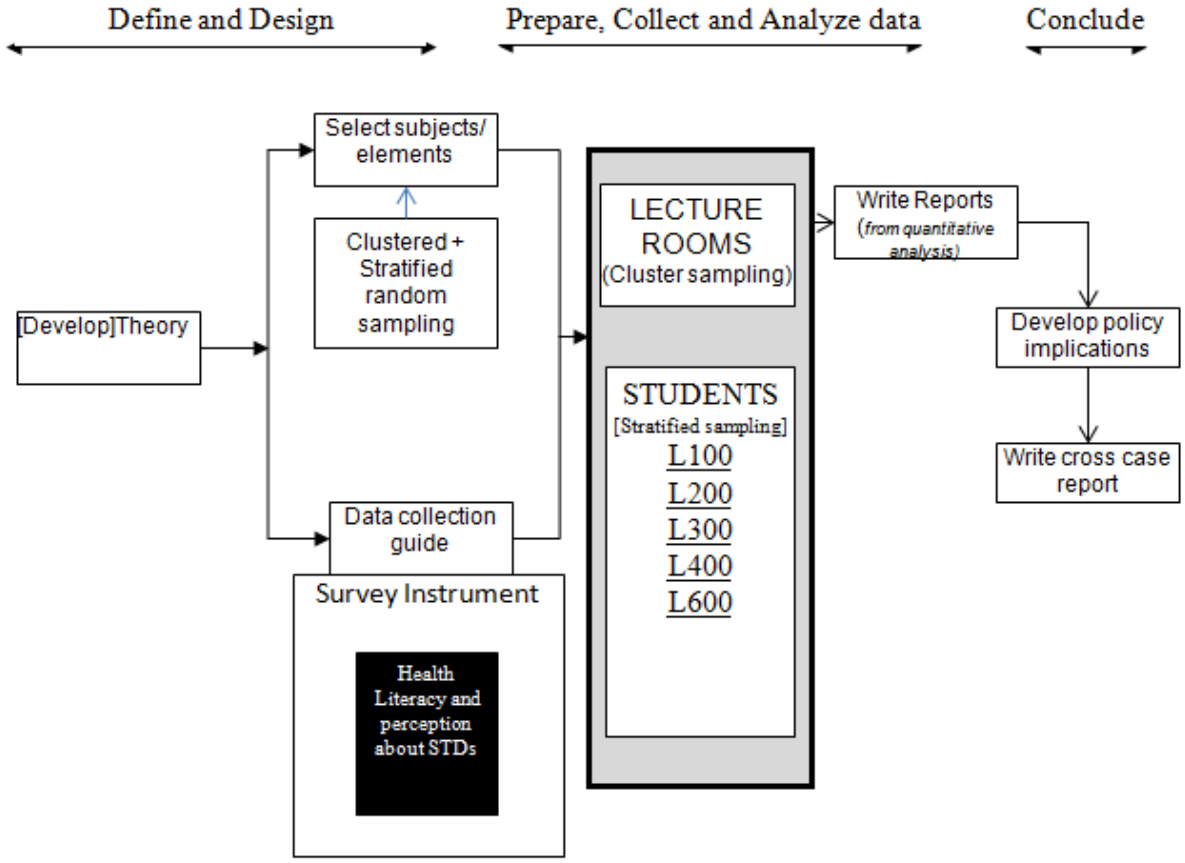
A survey produces quantitative data about an item or phenomena in a population. As hinted on from the beginning argument, it is characterized by a probability sampling technique which produces an unbiased representation of the population of interest. Usually surveys gather information which is not available from other sources, and results can be used to compliment existing data from secondary sources (Owens, 2002). There are essentially two variations in surveys: cross – sectional survey and longitudinal surveys. This study makes use of the former which involves collecting data at one point in time.

An advantage of survey is the flexibility of collecting a wide range of information. Surveys are standardized and usually are free from errors and they employ a large sample size which allows inferences to be made. Nonetheless, the survey method may have the disadvantage of low validity, especially with close-ended questions, issues of honesty and ability of the subject respondent to respond to certain questions because he/she might have forgotten the reasons for some actions. The overriding advantage

of making inferences on the whole population motivates this research approach while efforts have been made to design instrumentation to reduce errors and avoid tasking the memory of respondents.

The current survey involves students of university of Ghana across all levels and study endeavours. Figure 1 illustrates the methodological process employed, highlight the exact target population and methods of analysis

Figure 1: Survey methodology



3.3 Population

The population of a study is the larger group from which individuals are selected to participate in a study. Researchers differentiate between target population and study

population. According to Elston and Johnson (1994), target population is the whole group of individuals to which the researcher is interested in applying conclusions, and the study population is the group of individuals to which the researcher can legitimately apply the conclusions. In this study, the target population is University of Ghana female students who essentially reflect the target groups as defined by the topic of the study. These include students across all levels: Level 100, Level 200, Level 300, Level 400, Level 500, Level 600, Level 700; Distance learning students as well as Diploma students. The entirety of this target population was not reachable. For example, most, if not all students in level 500 have their lecturers outside the University precincts. This year – the fifth year of the university education - is usually spent abroad for departments that are applicable. Also distance learning students, by virtue of the time of data collection were not available to be surveyed. Thus, the researcher defined the study population which constituted a section of the student body, which is Level 100, Level 200, Level 300, Level 400, and Level 600. It is from this population that the sample is selected.

3.4 Sampling procedure and sample size

The sample for the study comprised 430 respondents from the University community. The University has a student population of 38,562 of which 15,651 are female students. The students were randomly selected from various academic levels (strata), but actually from the lecture halls (clusters). There was a conscientious effort to select lecture rooms in various departments but it is noticeable that most of the lecture halls in the University are commonly shared. Also, given that some courses, though may connote a certain discipline, may in fact be taken by students from other disciplines. This situation was especially true for lower academic levels, such as Levels 100 and

200; hence it was easier to select according to academic levels. This defines the dominant stratified random sampling approach in the study.

The selection of 430 students from the total female population of 15651 follows from the prescription of Krejcie and Morgan (1970) that, beyond a population size of 5000, a sample size of 400 will be adequate.

Motivation for selecting the female students using the above sampling criteria

The informational needs of the research only necessitated that the knowledge about STIs, sexual behaviour characteristics, attitude towards STIs and sexual health, and as well as health literacy be measured. Background studies from pretesting and talking to female students rather showed that sexual knowledge and health literacy could be homogeneous across departments. The only guess hazarded from this was that perhaps, among students of relatively lower educational level, knowledge base may be just about the same, contrary to assertion that those students with a science background may have a better appreciation of health literacy. Invariantly, attitudes towards sex and STIs from preliminary discourse with some female students of the study population showed did not show much heterogeneity among various disciplines. This perhaps implied that sexual behaviour and attitudes were driven more by other factors than knowledge. This remains a speculation; however, sample was not probabilistically selected and was not large enough. Besides, upper academic levels responses were not tested for any significant variations from lower levels. Hence, it was possible at this moment to treat sections of the population – in fact any given group of students in a lecture room in any department – as a cluster. Not knowing whether the distinction between departments may have any impact on the study; but learning from other studies, academic disciplines was only used as a minor selection criteria while educational levels was the major grouping variable for dividing the

population into stratums. Given the subject of enquiry and the absence of a sampling frame for students and the advantage of the situation where some students tend to attend lectures nearer to their departments, it was practical to define stratums of the student population with classes in the lecture theatres. Nonetheless, any lecturer theatre filled with students represented a cluster of subject disciplines. Thus, a multistage sampling of *cluster* and *stratified random sampling* was used to select the students. From each class, about one hundred students were selected. Classes with more than a 100 students only had a section of the students participating in the study. This meant that student selection went through a three stage sampling process: cluster sampling of lecture rooms and then stratified sampling of classes and simple random sampling of students. Resultantly, the selection of students involved both clustered sampling and stratified random sampling.

3.5 Instrument

In this study, data were collected from one source: through the survey questionnaire. The survey questionnaire was a self-administered instrument made up of both closed and open ended questions.

3.6 Questionnaire

Questionnaire as argued by Nwadinigwe (2002) are popular and common means of data collection and its popularity lies in the fact that it is simple to construct and easy to analyse responses that it generates using appropriate computer applications. Only one set of survey questionnaire was prepared to seek the opinion of students on health literacy and attitude towards STIs.

The students' questionnaire was composed of three main sections. The first was demographic background questions and these bordered on age, religion, relationship

status, academic level, number of years spent in school, as well as programme of study. The second section bordered on STIs and the subsections topics of interest were Knowledge about STI, Sexual risk behaviour characteristics, and Attitude towards STIs. While the first subsection contained domains that were open –ended, the other two subsection were closed with the third, essentially a likert –scale construct. The open - ended nature of the subsection on Knowledge about STI was to make students tell what they actually know, than to suggest what they thought their knowledge base about the subject was. The subsection on sexual risk behaviour characteristics had dichotomous responses (‘yes’ or ‘no’) while the construct on Attitude towards STIs and Sexual health was scale continuum from 1 to 5 containing 14 item. It was unidimentional construct meant to measure only attitude towards STIs without any inherent cohort(s).

The third section of the questionnaire was on Health literacy and this involved a two reading comprehension passages and numeracy test known as S-TOFHLA. Designed by Baker et al (1999) (see section under measuring health literacy in Chapter Two for more notes), it comprises two passages with a total of 36 items. The first text contains information about preparation for a gastrointestinal exam. The second is about rights and responsibilities of patients receiving health care in hospital. Each passage has every fifth or sixth word deleted and for each blank space, the respondent must select the word that best completes the sentence from a list of four words. The total score of the reading comprehension texts is 72 points, and every correctly filled blank space scores two points.

The numeracy test evaluates qualitative literacy needed in the health care setting. It comprises two medicine bottles and two cards containing information about medicine

intake, date of appointments and the result of a laboratorial test. The numeric items total 28 points with seven points scored for each correct response. The total score of the test is 100 points. Individuals scoring between zero and 53 points are considered in the inadequate range; between 54 and 66 points, in the marginal range, and between 67 and 100, in the adequate range.

3.7 Defining the Variables

There are two ways of thinking about causes: deterministically and probabilistically. Deterministic causation is where variable X is said to cause Y if, and only if, X invariably produces Y. That is, when X is present then Y will `necessarily, inevitably and infallibly' occur. On the other hand, probabilistic causation is illustrated by associating X with subjects that exhibit Y characteristics. In this study, the researcher looked at the deterministic causation where favourable (or unfavourable) attitude towards STI and sexual health were expected to be as result of adequate (or inadequate) functional literacy health literacy levels. A deterministic causation is used because it has been established through many researches (through time) that high favourable attitude towards STI and sexual health is as a result of high health literacy levels. While Suppes (1970) – cited in De Vaus (2001) - observes that most causal thinking in the social sciences is probabilistic rather than deterministic; it holds that many studies seem to have constructed the direction and type of the relationship between health literacy and attitude towards STI (see Chapter Two). In this study, level of education as well as sexual risk behaviour would be used as mediating factors and to diagnose the effect of health literacy on attitudes of STIs. In effect, the health literacy becomes the independent variable. The mediating factors are also independent variable. The dependent variable is Attitude towards STIs and sexual health. In measuring attitude towards STIs and sexual health, the scoring criteria was weighted

and aggregated for each single case to find out the average level of attitude (as measured by female students).

3.8 Pretesting

Hunt, Sparkman and Wilcox (1982) define pretesting as 'the use of a questionnaire in a small pilot study to ascertain how well the questionnaire works'. Pretesting an instrument is necessary because no amount of intellectual exercise can substitute for testing an instrument designed to communicate with ordinary people. The researcher used an undeclared pre-test to design the questionnaire for lecturers and students. By the undeclared pre-test, student respondents were not told the exercise was a practice run. The questionnaire was administered to 10 female students who were later on excluded from the study. All respondents were given an attached sheet to provide debriefings or comments on question items in terms of how they understood it and whether the scoring criteria satisfied the intent and nature of the question items. This approach was used because the students questionnaire were constructed using a difference continuum scale, where '1' referred to *Not probable/ strongly disagree* and '5' referred to *strongly agree/ Most probable*. Meaningless questions to the students as indicated by them were removed while question items were repositioned. The pretest took approximately two weeks to complete.

3.9 Issues of Validity and Reliability

The likert scale questionnaire for students were tested for reliability using Cronbach's alpha internal consistency method. Cronbach's alpha measures how well a set of items (or variables) measures a single unidimensional latent construct. Usually a statistic equal to or greater than 0.7 is said to be good. Below are notes or observation following pre-test:

3.10 Notes from Pretest of Student Questionnaire

a. A table to measure the knowledge about STIs was solicited using responses (written) on effects, symptoms, treatment and whether the diseases can be completely cured on selected common STIs. this was added because it was found that provision of list of STIs from which students could choose from was not a good measure of knowledge about STIs, since students could just tick answers. this new input also served as a measure of validity and reliable in measuring actual knowledge.

b. Sexual risk behaviour items were increased from four to six. and the last of the previous four which actually measured predisposition to STI was removed.

c. The items measuring attitude towards STI and sexual health was increased from 10 to 14 since the first one had low reliability using Cronbach's alpha and some alpha loadings if item were deleted were very low. At the same time some items that had a lot of non-response were removed. Debriefings from respondent helped improved the construct, after which the Attitude towards STI and sexual health yielded an alpha value of .867 on 14 items after 7 items (for which their inclusion yielded .782) were removed in the new construct. The retest reliability test for the actual study was .845.

d. The health literacy questionnaire constructed was entirely replaced with a standard one by Baker et al (1999), the S-TOFHLA. This was however modified slightly. For example, issues of Medicare was slightly changed to the equivalence of National Health Insurance Scheme (NHIS) of Ghana. The comprehension test on X-ray preparation was not changed since; x-ray is one of the commonest features that students went through. In fact, it was a practical requirement for all students of the University of Ghana to undergo a medical examination (which included x-ray) before they advance to the second

semester of the first year. The numeracy test also had to do with two issues of labels on prescription bottles and a prompt card that inquired about normalcy of the blood sugar level of a hypothetical person given the normal blood sugar ranges. the next was on appointment to see a doctor.

3.11 Data Collection Procedure

Following the selection of the sample and the sampling methodology employed, the researcher went to selected lecture rooms and surveyed the students. But before the questionnaires were distributed to students, the researcher sought to find out the academic level of the class attending the lectures. Permission was asked of the lecturer teaching the class before the questionnaires were distributed but the data collection took place after the class. There were times that the questionnaires were administered and collected before the class; those were the moments that the lecturer came in a little bit late. The questionnaire took approximately 15 minutes to answer and so female students sampled were encouraged to answer the questionnaire on the spot. It took approximately three weeks to distribute questionnaire and retrieve them.

3.12 Technique of Data Analysis

In analysing quantitative data, the Statistical Package for Social Sciences (SPSS) version 16 was used. The likert responses in the constructs on the student questionnaire were weighted as indicated in the questionnaire with the value chosen:

Rating scale: Not probably/ strongly disagree ← [1] [2] [3] [4] [5] → strongly agree/ Most probable.

Completed questionnaires were cleansed and some missing item responses were taken care of using appropriate methods of logic based on previous responses and assumption and the option of entering midrange values for the construct especially. In

cases where non responses were high, the entire case was excluded. After editing and coding the responses and entering it the SPSS data editor file, preliminary descriptives were run to help further cleanse the data and verify the behaviour of some variables. The variables, some of which were slightly skewed were not transformed as the least square method that underpin most parametric methods was robust enough. In addition, the large sample allowed an approximation to normality, by the central limit theorem. Statistical tests such as the one sample t-distribution were used to test for statistical significance of opinions of respondents on attitudes towards STIs and sexual health.

The test statistic for the student t-test is:

[the null hypothesis that the population mean is equal to a specified value μ_0 is tested]

$t = \frac{m - \mu_0}{s / \sqrt{n}}$ where

m is the sample mean, s is the sample standard deviation of the sample and n is the sample size. The degrees of freedom used in this test is $n - 1$. The population mean set in respect for the data is the summated midpoint value of the construct. Significant departure of m from μ_0 would yield a p-value below the significance level of 5%. For the purposes of this study, a significant departure from μ_0 associated with a greater m would mean a less favourable attitude towards STIs and sexual health. This was again computed for each academic level and the means and standard deviation for the various levels would be noted. The health literacy level for each student was computed before applying the regression error model:

$$\boldsymbol{Y=BX+E}$$

Where:

Y *is the column vector of dependent variable, 'Attitude towards STIs and sexual health'*

B *is the vector of coefficients*

X *is the matric of independent random variables including the Health literacy and the mediators, where identified.*

E *is the error term accounting for other extraneous variables unaccounted for*.

Subsequently a hierarchical regression was constructed and another multiple regression analysis for the various academic levels was run. This helped measure effect sizes of impact of health literacy levels on attitude towards STI and sexual health for the various academic levels.

RESULTS : CHAPTER FOUR

4.0 Introduction

This chapter presents the results of the study and is divided into five sections. The first comprises demographic and background information on the respondents. The second presents results mainly related to the levels of knowledge of sexually transmitted diseases (STDs) among the female population of the University of Ghana. The third section looks at the treatment of STIs; the fourth section covers the health literacy and attitude measures and how they relate to each other. The fifth section, explores ways of improving health literacy in order to improve attitudes towards STIs.

4.1 Demographic and background information

This section presents the demographic information on age and religion. Other background information presented are relationship status, academic level and programme of study. The last item in the section inquires about whether the respondents have had an STI before or not.

Age distribution

The age distribution of respondents is skewed towards the lower age group with more than half (54%) of the respondents in the age group 21-23 years. Together with the lowest age class, they constitute 87% of the sampled respondent.

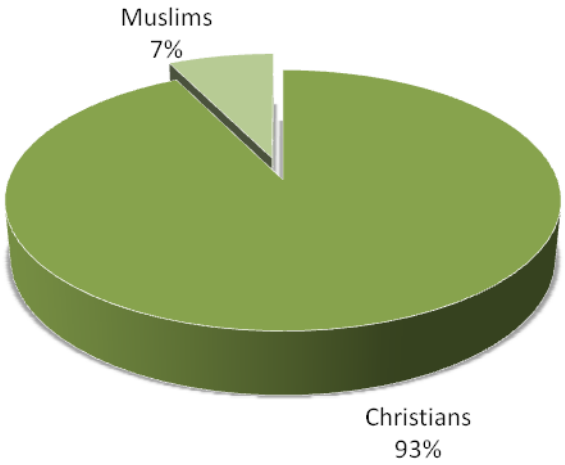
Table 1: Age distribution of respondents

Age class (in years)	No. of respondents	Percent
17 – 20	141	32.8
21 – 23	234	54.4
24 – 26	42	9.8
27 – 30	9	2.1
31 – 35	4	.9
36+	141	32.8
	430	100

Religion

Most respondents were Christians (92.7%) with some few Muslims (7.3%) (Figure 2).

Figure 2: Religious affiliation of students



Relationship status

More than half of the female students (55.5%) were single as at the time of the study. Less than 2% had been married but about 41% were dating. Of those females who were single about 41% of them (representing 23% of female sample) had dated before (Table 2). In essence, about 67% had been in some sort of relationship before or are currently in a relationship.

Table 2: Relationship status

Relationship status	No. of respondents	Percent
Single	234	55.5
Have had a boyfriend before	*95*	*40.6*
Have never had a boyfriend before	*139*	*59.4*
Dating	177	41.2
Married	8	1.9
Separate/Divorced	1	.2
Co-habiting	2	.5
	430	100

Academic levels of students

There seem to be a fair, rather than uniform distribution of students among the various academic levels. Female students from level 100 constituted approximately 22%; Level 200 students constituted 34.4% while level 300 students constituted about 24.2%. Students from level 400 were less than 20% and students from the graduate school were less than 1%. Table 3 gives details.

Table 3: Academic levels of female students

Academic levels	No. of respondents	Percent
Level 100	94	21.8
Level 200	148	34.4
Level 300	104	24.2
Level 400	82	19.1
Level 600	2	.5
	430	100

Programme discipline

Many students (65.3%) are pursuing programme in the Arts in comparison to the Sciences (27.7%) or the Fine Arts (4.6%) (Table 4).

Table 4: Programme discipline of students

Programme discipline	No. of respondents	Percent
Arts	281	65.3
Arts & Science	10	2.3
Fine Arts	20	4.6
Science	119	27.7
	430	100

4.2 Knowledge on Sexually Transmitted diseases (STIs)

This section presents the knowledge of the female students on sexually transmitted Infections. Students were typically made to provide responses on what they thought were STI, how it could be contracted and its preventive methods. Hence knowledge of

STIs were essentially measured on broad definition, mode of spread and prevention of the infection. Issues on source of information on STI are also presented.

Asked what the term sexually transmitted infections meant, most of the respondents answered by giving a causative definition. This mainly fell in the domain of two answers which are in fact the same: infections that are transmitted through sexual intercourse or sexual activity and diseases that are transmitted through sexual intercourse or sexual activity. In any of the forms, that is, whether a disease (showing symptoms) already or infections, the causative organisms are transferred from an infected person to the healthy person. It must be noted that as much as 92% of the female students limited their definition however to sex or sexual intercourse only. Only a few students, just about 5%, suggested that it was transmitted through sexual activity which included sexual intercourse, oral sex and anal sex. Some few students, nonetheless, only mentioned some STIs, and others indicated that it is a killer disease and that it affects the human system. About 2.3 % did not give any response at all.(Table 5).

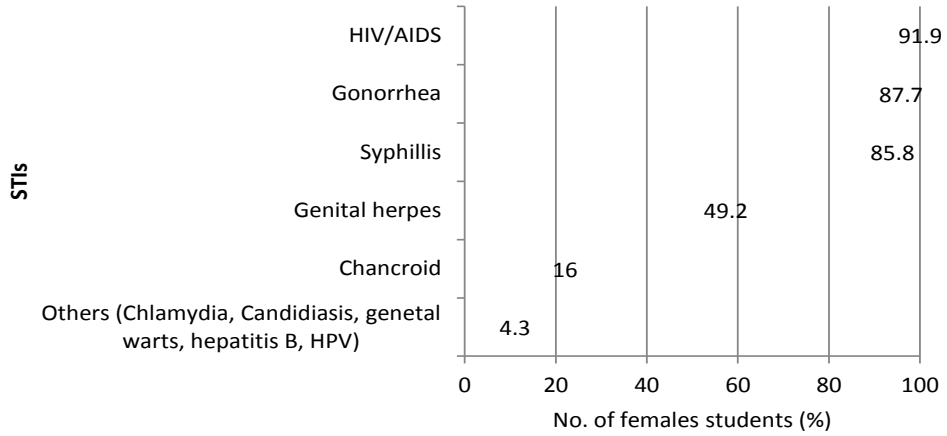
Table 5: Explaining the term sexually transmitted infections (STI)

Response	No. of respondents	Percent
Infections/diseases that are transmitted through sexual intercourse or sex	396	92.1
Infections/diseases that are transmitted through sexual intercourse or sexual activity	21	4.9
Other responses (e.g listed names; STI are killer diseases, affect human system)	3	.7
No response	10	2.3
	430	

Knowledge about specific STIs was positive among all female students. While approximately 92% of female students knew about the HIV/AIDs, 87.7% knew about

the Gonorrhea, followed by Syphillis (85.5%). A considerable few students knew about the Genital Herpes (49.2%) and Chancroid (16%) (Figure 3). Less than 5% additionally knew about any of the following diseases or infections: Chlamydia, Candidiasis, Genital warts, hepatitis B, HPV.

Figure 3: Knowledge about names of STIs



Many respondents (72.5%) also indicated that they knew the signs and symptoms of STIs. Indeed 72.5% knew at least one symptom of STI. 66.5% percent knew at least 2 symptoms whereas about 53% percent knew at least three symptoms. The difference between the proportion of students who indicated at least one symptom and those who indicated at least two symptoms is 6%, suggesting that only 6% had knowledge of only one symptom.

Table 6: Knowledge about symptoms of STIs

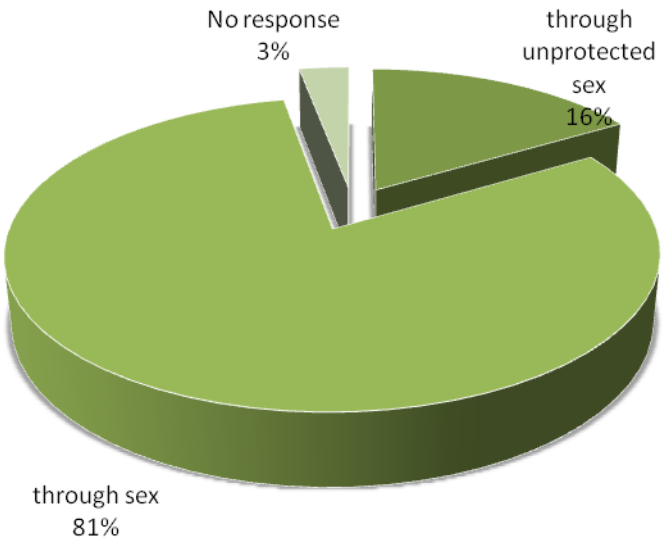
Responses	No. of respondents	Percent
Knows signs and symptoms of STIs	312	72.5
At least one symptom	*312*	*72.5*
At least two symptoms	*286*	*66.5*
At least three symptoms	*228*	*53.0*
No knowledge of signs and symptoms of STIs	118	27.4
	430	

Symptoms mentioned were vaginal discharges, loss of appetite, bleeding after sex, genital ulcerations, rashes on genitalia, painful urination, and anaemia, among others. Responses, such as infertility were a probable symptom, but are evidently an aftermath of the disease.

Knowledge on Causes

Specifically asked how the infection was spread, apart from 13 female students who declined to answer, only 16% indicated specifically that STI was contracted through unprotected sex. Many indicated that it was transmitted through sex (Figure 4).

Figure 4: Response on Mode of contraction of STI



Knowledge about Prevention of STI

Students response to whether STI can be prevented or avoided showed that almost all the respondent (99.1%) answered in the affirmative. Nonetheless, only 86% provided specific responses on preventive methods. The most popular preventive method from STI contraction mentioned was abstinence (71.2%), followed by insistence on condom use and its usage (66.3%) and then sticking to one partner (34.2%). The use of the female condom was indicated by 3.4% students. Some students also wrongly

indicated that the pill (3%) and emergency contraceptive (12.1%) can be used to prevent STIs.

Table 7: Is STI preventable?

		No. of respondents	Percent
STI is preventable		426	99.1
Means:	Abstinence	306	71.2
	Insistence on condom use	285	66.3
	Stick to one partner	147	34.2
	Female condom	15	3.4
	Emergency contraceptive	52	12.1
	Pill	13	3.0
	No answer	56	13.0
STI is not preventable		4	.9

4.3 Treatment of STI

This section presents responses in treatment of STIs among the female students. Nonetheless, they were also asked whether they have had any STIs before or experienced a host of symptoms which are usually associated with STIs. These are presented in Figure 5, and Table 7.

Results show that only 10 (2.3%) female students indicated that they have had an STD before (Figure 5). In other words, 2 out of 100 female students may have an STI. The diseases were mainly Gonorrhoea, genital herpes and candidiasis. Only three out of the 10 students informed their parents about the condition.

Figure 5: Proportion of Female Students who have had STI before

However, 37% have had lower abdominal pain, 16.9% have had virginal discharges, and 2.1% have had ulcerations in their private part before. Except for the latter symptom, these however, may not indicate the presence of an illness.

All the 10 students sought treatment at either a clinic (2 persons), or herbalist (2 persons) or a hospital (6 persons). The students took steps not to infect their partners mainly through abstinence. Only one female students used a condom.

Table 8: Treatment of STIs

Place of treatment	No. of respondents	Percent
Have had STI before		
Clinic	2	0.46
Herbalist	2	0.46
Hospital	6	1.3
Have not had any STD before	420	97.7
	430	100

4.4 Health literacy and Attitude towards STI and sexual health

This section presents results on reliability tests of the construct for measuring the Attitude towards STI and sexual health, and descriptives on Health literacy and also Attitude towards STI and sexual health.

Retest - Reliability Analysis of Attitude towards STI and sexual health construct

The measure of reliability used here is the Cronbach's alpha. Cronbach's alpha measures how well a set of items (or variables) measures a single unidimensional latent construct. When data has a multidimensional structure, Cronbach's alpha will usually be low. Thus, Cronbach's alpha is a coefficient of reliability (or consistency). The rule of thumb for accepting a scale construct as a good measure of a variable is provided by George and Mallery (2003) where alpha "≥ .9 – Excellent, ≥ .8 – Good, ≥ .7 – Acceptable, ≥ .6 – Questionable, ≥ .5 – Poor, and < .5 – Unacceptable"(p.231). At least an acceptable measure paves the way for further analysis using the construct as a legitimate variable of measurement. Table 9 shows the reliability statistics produced from the Cronbach's alpha consistency method for the scale on Attitude towards STI and sexual health.

Table 9: Reliability Analysis of Scale on the Dimensional Constructs of Attitude towards STI and sexual health

	Reliability Statistics	Number of Items	Valid Cases
Attitude towards STI and sexual health.	.845	14	425

Reliability statistics using Cronbach's alpha for the Attitudinal scale (Attitude towards STI and sexual health) as a unidimensional construct yielded a value of .845. These statistics are regarded as acceptable or good.

Attitudinal levels

Based on the weighting for the likert scale used in measuring attitudes, scores fall within the continuum 14 – 70 with a midpoint mark of 42 which may be conveniently referred to as a pint of neutrality. At this point the rating score for each students correspond to '3' (interpreted as neutral) for each of the 14 item, culminating in 42 points. It is thus expected that lower values scored, away from the summated midpoint mark imply a healthy attitude towards STI and sexual health and larger values correspond to an unhealthy attitude towards STI and sexual health. In other words, students who show a health attitude are actually hostile to the spread of STI. The Attitude towards STI and sexual health may be varied across different age groups and academic levels. Table 10 and Table 11 provide such analysis.

The distribution of level of attitudes towards STIs for the various age groups range from 17.406 to 23.264 (Table 10). Given that the scale tend to assume lower values for attitudes that are more hostile to the spread of STIs, it can be inferred that female students of the lower age groups have an healthy attitude towards STIs and posses a health sexual health in comparison to all other age groups and better than the group average (18.826). The Age group 24- 26 years showed relatively the highest favourable attitude towards STI but the variation among students in this group was quite large in comparison to the other groups. Together with the students in age groups 21 – 23, 27 – 30 and above 31 years, ratings for attitudes towards STI seem more favourable in comparison to the group average. Nonetheless, in comparison to the summated midpoint mark of 42, statistical tests show that female students of all age groups have a significantly healthy (i.e. hostile) attitude towards STIs and high sexual health ($M=18.826$, $SD=8.082$, $t=-56.26$, $p<.01$). Comparison of average attitudinal level for the various age groups also showed a significant difference

(F=5.367, p<.01). Post hoc tests using the Least Significance Difference method also showed that variations emanate from average attitudes levels for age groups 17 – 21 and 21 - 23, between 17 – 21 and 24 – 26, and between 21 - 23 and 24 – 26 (see Appendix 2c).

Table 10: Means and Standard Deviations for Attitudes towards STI and Sexual health for various age groups

Age	Mean	SD	t-test(p-value)	F, p-value
17 - 20	17.406	5.916	-48.043(.000)	5.367 (.000)
21 - 23	18.883	8.570	-39.078(.000)	
24 - 26	23.264	10.540	-10.609(.000)	
27 - 30	21.506	6.857	-8.944(.000)	
31 +	21.333	7.023	-7.181(.019)	
Overall	18.826	8.082	-56.260(.000)	

NB: Means values are 5% trimmed means (see appendix 2a showing outliers)
Summated midpoint value for 14 items have been used as test value. Test value is 42 for the scale continuum for of 14 – 70 which is the range of attitude towards STI and sexual health. Test is significant at .05

.

Similarly the levels of attitude towards STI and Sexual health in respect of the different academic levels shows that all students of academic levels, except for level 300 and levels 400 have a high score on attitude than the group average of 18.826. Female students in Levels 300 and 400 had higher scores than level 100, level 200 and Level 600 (Table 11). Level 600 female students had the lowest score albeit they constitute the lowest subsample. All average score values for attitude are below the summated midpoint mark of 42, suggesting that students generally show an unfavourable attitude towards STI and exhibit a sexual health. This was found to be statistically significant for all academic levels (p<.05). However, there were significant variations in attitude scores for the various academic levels (F=2.567, p<.038) and Post hoc tests (shown in Appendix 2d) show that they emanate from

difference in score values between Level 100 and level 300 students and between Level 100 and level 400.

Table 11: Means and Standard Deviations for Attitudes towards STI and Sexual health for various academic levels groups

Academic level	Mean	SD	t-test(p-value)	F, p-value
Level 100	17.091	6.119	-37.848(.000)	2.567 (.038)
Level 200	18.794	8.122	-32.614(.000)	
Level 300	19.311	8.851	-24.233(.000)	
Level 400	20.569	8.963	-20.515(0.000)	
Level 600	14.500	.707	-55.000(.012)	
Overall	18.826	8.082	-56.260(.000)	

NB: Means values are 5% trimmed means

Summated midpoint value for 14 items have been used as test value. Test value is 42 for the scale continuum for of 14 – 70 which is the range of attitude towards STI and sexual health. Test is significant at .05

Health literacy

S-TOFHLA is a measure of the patient's ability to read and understand health care information, their functional health literacy. S-TOFHLA Numeracy assesses their understanding of prescription labels, appointment slips, and glucose monitoring. S-TOFHLA Reading Comprehension assesses their understanding of health care texts such as preparation for a diagnostic procedure and Medicare Rights & Responsibilities

Table 12 shows that health literacy levels of students on the average were 60.56 percentage points for reading comprehension, 21.2 percentage points for Numeracy and an overall functional literacy score of 81.75.

Table 12: Health literacy assessment – overview

Age	Mean	SD
Numeracy	21.1953	7.35538
Comprehension	60.5581	11.74258
Health Literacy	81.7535	16.95832

According to Nurss, Parker, Williams and Baker (1995), the S-TOFHLA has the following functional health literacy levels: 0 – 53 for Inadequate Functional Health Literacy, 54 – 66 for Marginal Functional Health Literacy and 67 – 100 for Adequate Functional Health Literacy. Table 13 suggests that many students (90%) have adequate functional health literacy. Less than 10% had inadequate functional health literacy with about 3% having marginal Functional health literacy.

Table 13: Functional literacy levels

Functional literacy levels	No. of respondents	Percent
Inadequate Functional health literacy	29	6.7
Marginal Functional health literacy	14	3.3
Adequate functional health literacy	387	90.0
	430	100.0

Levels of functional literacy among students of varying age groups and academic levels

Irrespective of the few who had inadequate functional health literacy, all students of the various age groups and level of education had adequate functional health literacy (Table 13).

Among the various age groups, the highest age group had the lowest score which still fell in the domain of Adequate Functional Health Literacy, while the age groups 21 – 23 showed a high Adequate Functional Health Literacy. Nonetheless, there was statistically no significant difference between the health literacy scores of students in the different age group ($F= .197$, $p=.940>.05$). The same can be said of health literacy among students of the various academic level ($F=.974$, $p=.422>.05$), even though

students in Level 200 (second year) had the lowest Functional health literacy relatively, followed by Level 400 and then Level 100. Collapsing the levels in low and high education level categories with respect of health literacy level also yielded no statistical significance upon comparison (t=-1.040, p>.05). Further, students across broad disciplines of study exhibited Adequate Functional health Literacy and there is no significant variation among their levels (F=2.2, p>.05)

Table 14: Means and Standard Deviations for levels of Functional health literacy

Feature	Mean	SD	Interpretation
Age			
17 - 20	83.821	17.717	Adequate Functional Health Literacy
21 - 23	84.662	16.309	Adequate Functional Health Literacy
24 - 26	83.593	12.772	Adequate Functional Health Literacy
27 - 30	82.247	25.592	Adequate Functional Health Literacy
31 +	81.333	15.044	Adequate Functional Health Literacy
F= .197(p=.940)			
Academic level			
Level 100	84.652	14.273	Adequate Functional Health Literacy
Level 200	83.126	19.187	Adequate Functional Health Literacy
Level 300	85.671	11.714	Adequate Functional Health Literacy
Level 400	84.036	19.241	Adequate Functional Health Literacy
Level 600	87.500	14.849	Adequate Functional Health Literacy
Overall	81.7535	16.958	Adequate Functional Health Literacy
F=.974 (p=.422)			
t-test for comparison of high educational level (≥Level 300) and low educational level (<Level 300) yielded (t=-1.040, p=0299>.05)			
Programme of study			
Arts	85.558	17.227	Adequate Functional Health Literacy
Fine Arts	72.444	25.325	Adequate Functional Health Literacy
Science	85.893	15.808	Adequate Functional Health Literacy
F=2.2 (p=.087)			

NB: Means values are 5% trimmed means

Further investigation show that majority of female students who had Inadequate Functional Health Literacy were in the 21 – 23 years age group and also of level 200 (see Appendix 2e and 2f) but this was not enough to cause any variation as already indicated.

The relationship between health literacy and attitude towards STI

The correlation between health literacy and Attitude towards STI and Sexual Health was found to be a very weak one (r=-.020) albeit a negative relationship. This suggests that higher literacy levels are associated with a healthier attitude towards STIs. The regression coefficient (-.009) portrays a very small, almost negligible effect of Health literacy on Attitude towards STI and Sexual Health. It is however important to note with caution that, the results does not mean that health literacy does not have any effect on attitudes as it must be noted that as many students are of Adequate functional health literacy possess very hostile attitude towards the spread of STIs. This weakens any forceable correlation which could have easily been perceived with data that fall within the continuum of favourable attitude towards STIs and hostile attitude towards STIs and also inadequate and adequate health literacy.

Table 15: Coefficients of regression

Model	R	Coefficients	t	Sig.
(Constant)		20.7(1.925)		
Health Literacy	-0.020	-.009 (.023)	-.401	.688

Dependent Variable: Attitude towards STI and Sexual Health

4.5 Summary of findings

1. The age distribution of University of Ghana female students show that majority (87%) of students are within the 17 – 23 years age group and are mostly of the Christian religion (92.7%). From the various academic levels,

students were predominantly sampled from the Arts discipline (65.3%) compared to the science discipline (27.7%).

2. More than half of the female students are currently single and analysis shows that 67% have been in some sort of relationship before or are currently in a relationship.
3. Majority of students (92.1%) understood the term sexually transmitted disease to mean infections/diseases that are transmitted through sexual intercourse or sex rather than sexual activity (4.9%) which encompasses oral sex and anal sex and perhaps other activities.
4. Approximately 92% of female students knew about the HIV/AIDS, 87.7% knew about the Gonorrhea, followed by Syphilis (85.5%). A considerable few students knew about the Genital Herpes (49.2%) and Chancroid (16%) and less than 5% knew about the many other STIs.
5. With respect to the symptoms of STIs, 72.5% knew at least one symptom of STI, 66.5% knew at least 2 symptoms and 53% percent knew at least three symptoms. This implied that only 6% indicated one correct symptom.
6. Many (81%) indicated that STIs was spread through sex; only a few qualified it to be unprotected sex (16%).
7. The most popular means of prevention known to students was abstinence (70%) followed by condom use (65.2%) and sticking to one partner (33.6%). Some students also wrongly indicated that the pill (3%) and emergency contraceptive (12.1%) can be used to prevent STIs Less than 1% opined that STI was not preventable.
8. A significant majority (98%) of students had not had any STI before.

9. Of those who have had STI before, treatment was sought from hospital mostly and also the clinic or herbalist.
10. Students had a significantly healthy attitude towards STI and sexual health (M=18.826, SD=8.082, t=-56.26, p< .01). While students in all age groups showed the same healthy attitude (p<.05), comparisons of average attitudinal level for the various age groups showed a significant difference (F=5.367, p<.01). Post hoc test using LSD method shows that variations emanate from average attitudes levels for age groups 17 – 21 and 21 – 23 (p<0.05), between 17 – 21 and 24 – 26 (p<.01), and between 21 - 23 and 24 – 26 (p<.01).
11. Students in the various academic levels also had a significantly healthy attitude towards STI and sexual health, but showed variation upon comparison (F=2.567, p<.038). Post hoc tests showed that variation were between Level 100 students and Level 300 (p=.01) and Level 400 students (p<.05).
12. Students showed high functional health literacy in terms of numeracy (M=21.195 SD=7.355), reading comprehension (M=60.558, SD=11.742) and overall health literacy (M=81.753, SD=16.958).
13. Subsequently, 90% of female students showed Adequate functional health literacy as oppose to 6.7% who showed Inadequate Functional health literacy. Less than 5% showed Marginal Functional health literacy.
14. Analysis of health literacy among the various age groups and academic levels also showed that, there is no variation of health literacy among age groups (F= .197(p=.940) and academic levels (F=.974 (p=.422). All age group and academic levels showed Adequate Functional Health Literacy. Further investigation show that majority of female students who had Inadequate

Functional Health Literacy were in the 21 – 23 years age group and also of level 200, but this was not enough to cause any variation as already indicated.

15. The correlation between health literacy and Attitude towards STI and Sexual Health was found to be a very weak one (r=-.020) albeit a negative relationship. Thus any effect size – from regression analysis – was negligible (b=009) and insignificant (p>.05).

DISCUSSION : CHAPTER FIVE

5.1 Introduction

The objectives of the study were to determine the level of student knowledge of sexually transmitted infections (STIs) and also find the relationship between education and health literacy. Again it is aimed at identifying how sexually transmitted diseases are treated among University of Ghana female students who are the target population for the study upon which inference is made. A concluding objective is to examine the influences or otherwise of health literacy on the attitude towards sexually transmitted diseases.

Pertaining to the objectives, the study found that majority of University of Ghana female students knew a lot about sexually transmitted infections, in terms of terminology, types, symptoms, causes, and prevention. They also exhibited a high functional literacy rates as well as a healthy attitude towards STI. Correlational analysis showed a lack of significance which could be attributed to the distribution of scores on both variables which are mostly concentrated on one extreme end of the scale continuum. Though health literacy influenced attitudes towards STI, the effect size was small. The ensuing discusses the results of the study in details, using the research questions as a guide.

5.2 Students' knowledge of sexually transmitted Infections

The related question sought to determine students' knowledge on Sexually Transmitted Infections (STIs). This was explored in terms of terminology, type of STIs, symptoms, causes, and prevention. Results showed that majority of students understood the term and indicated that they were infection or disease transmitted through sexual intercourse and activity. This corroborates the definition from the World Health Organisation (WHO.2013), indicating that the basic understanding of STI as exhibited by the female students conform to global definition and

understanding. While it may be important to distinct between sexual intercourse and sexual activity, like the national Health Service of the united Kingdom has suggested, it may be difficult to conclude that students who noted only sexual activity were not aware that other practices such as anal sex and oral sex can also lead to the spread of STI if one should come into contact with an infected person. Other responses offered by some respondents which were not considered as correct had to do with the effect of STIs or what it represents. Some students submitted that it was a killer disease which was rightly so. Others also pointed out that they were diseases that completely compromised the immune system. It is easily assumed that the only disease that compromised the immune system is the human immunodeficiency virus (HIV) and AIDs. Nonetheless, the WHO and United Nations Programme on HIV/ Acquired Immune Deficiency Syndrome (UNAIDS) have indicated that there is a well-established evidence that STDs facilitate the transmission of infection with the human immunodeficiency virus (HIV) (WHO/UNAIDS,1999)

In terms of types of STIs, a significant majority indicated some type of STI. Many students knew about HIV/AIDs than any other diseases or infection. This is however not surprising, as it is observed that there is more campaign about HIV/AIDs than any other sexually transmitted disease. In fact, over the last decade, there was more talk about HIV/AIDs than any other disease on the global stage. This is because HIV is one of the few diseases that scientists in the world are yet to find cure, nonetheless, it spread among people of all class, race, and religious affiliation. Other important diseases also mentioned by many female students were Gonorrhoea and Syphilis. These are also commonly noted and publicised throughout the mass media. STIs such as Chancroid, Human Papillomavirus (HPV) and Chlamydia were also noted by very few people, less than a fifth of the sample. Others such as Trichomoniasis, candidiasis

and Hepatitis B were not mentioned by any student at all. This suggests that knowledge about types of STIs is very narrow among the students. It was therefore not surprising that some students only knew one symptom of an STI.

Knowledge about symptoms of disease is very important; it acts as a shield towards the development of the disease in the sense that, one is able to cure him or herself of a disease before it develops into an advanced stage. Responses given by students show that at least almost three - quarters of females students knew one symptom and just a little over half of the students knew at least three symptoms. This shows a relative poor knowledge of symptoms of STI given the educational level of students. It is expected that university students would know the various STIs and their symptoms very well, as such topics are taught in the senior high school and also an introduction to the subject is given in the junior high. Needless to mention, unless, students only studied for examination purposes, elements such as the symptoms of very important disease should be an important focus. Again, it is the case that an STI may have more than one symptom, suggesting that the six percent of students who knew only one symptom could be at a higher risk of suffering from an STI if they should ever contract one.

It was also a common knowledge among students that STI prevention was guaranteed with abstinence. Condom use and sticking to one partner, in that order, were mentioned as preventive measures for the spread of STIs. It is noted that all this methods except sticking to one partner, help prevent contact with the medium – blood, vaginal fluids, and sperm - through the causative organisms – whether pathogen, bacteria, or virus – are transmitted from person to the other of any sexual orientation. Sticking to one partner is a choice that does not allow or limits sexual contact significantly to the point that does warrant any transfer of such fluids. Some

students also wrongly indicated that the pill and emergency contraceptive can be used to prevent STIs. This was wrong knowledge and very dangerous to the health risk of those students. The Pill and emergency contraceptive are used as pregnancy prevention measures. It must be noted that the only method that prevents both pregnancy and STI is the condom.

5.3 Education and health Literacy

Literacy simply deals with understanding a phenomena and knowing how to apply such knowledge. Many authors have suggested that education is a function of knowledge. This is easily perceptible as education – whether formal or informal - opens the mental faculties of a person, thereby allowing one to appreciate the dynamics involved with a phenomenon. Results showed that students had Adequate Functional Health Literacy irrespective of their educational level. This is a very good outlook when the statement by Leonard Sagan that the prevalence of literacy was the most consistently powerful predictor of life expectancy by far (Sagan, 1987). The study which used the academic levels of students as a measure of educational level showed that there is no significant variation of health literacy among different academic levels. This result seem at variance with studies by Kirsch et al (2002), Backlund et al (1999), Huisman et al (2005) and Marmot (2002) who show the a strong relationship between the two cohorts that suggest that persons with decreased health literacy are more likely to have less education. Perhaps the reason for the variation might be explained by the lack of variation in the educational levels of students in this study in comparison to the other studies. The students in the study were all university students who evidently with regard to the subject matter under investigation showed parallel knowledge irrespective of the educational level so defined here. Furthermore, even though a significant minority – of 48% - of female students who had Inadequate Functional Health Literacy were in their second year,

this was not statistically different from the proportion of students with such literacy level spread among the other academic levels. This buttresses the point that the differences in education per academic levels are not large enough to yield any changes in the health literacy level of students. Another plausible reason could be sighted from the National Network of Libraries of Medicine (2012) that health literacy may not be related to years of education or general reading ability. Again for the students pursuing programmes in the Arts, Fine Arts and Science disciplines, there was no significant variation, though average health literacy scores though suggest that there could be some variation between students in Fine Arts and other students in either Arts or Sciences.

5.4 Treatment of STIs

The related question sought to find out how female students treated sexually transmitted diseases. Results, however, show that only 10 female students, representing 2.3 percent of students have had an STI before. This rate reflects the incidence of STI for Neisseria gonorrhoea for the African region as indicated by WHO (2012). It is however lower than the estimate from the CDC of the United States that one-in-three Americans has a sexually transmitted infection (CDC 2013). The Neisseria gonorrhoea is one of three main infections that respondents indicated they contracted. The others are Genital herpes and Candidiasis where the latter has lower risk factors. Nonetheless, the statistics indicate that 2 out of every 100 students may have had an STI before. Students with STI sought treatment mostly in the hospital while others took them to the clinic and still other use the services of a herbalist or herbal medicine. This reflects the WHO's submission that social changes influences the patterns in prevention and treatment of STIs (WHO 2012). It is very plausible even in the light of this study as persons who seek herbal treatment are

counselled by close relatives or friends who perhaps have had such treatment before, indicating the role of social interaction. The fact that students cured their STDs in various places shows that all the avenues for cure were equally good.

Health Literacy and Attitude towards STIs and sexual health

The relationship between STI and health literacy is the subject of the fourth objective. The last objective seeks to specifically find the influence of health literacy on STI. As already indicated in the Chapter Three, the attitude towards STI was used as a measure of STI rather than an empirical test of STI among the students. Attitudes suggest propensity and in this light, higher scores of STI indicated a higher propensity to spread or contract an STI.

Results have indicated that students had a significantly healthy attitude towards STI and sexual health. However, there was some variation with respect to age and educational level where students in the lowest age group – 17-20 years - had scores significantly lower from scores for the 21-23 and 24 -26 year age groups. Attitudes also varied between first year students and third and fourth year students, with first year students having a healthier attitude towards STI and sexual health. Students showed adequate functional health literacy and healthy attitudes. This seems to give impetus to submissions by Mehrotra and Wagner (2009) and Kimball (1999) that health information could mean the difference between life and death. The information of health possessed by students has helped them to maintain a healthy attitude towards STIs. It can therefore be concluded that health literacy is very important in controlling the spread of STIs, quite in consonance with Nutbeam, (2008) and CDC who have indicated the importance of health literacy.

The level of association between attitudes and health literacy, however, was a weak one albeit a negative. The weak relationship is as a result of the differences in

variances of attitudes exhibited by the students and their scores for health literacy which was rather high, nonetheless, concentrated at only one section of the plane defined by both variables. The negative relationship indicates that a high literacy scores (for better literacy level) were associated with lower attitudinal scores (for healthier attitudes towards STI), conforming to an expected relationship between literacy and ability to take care of one's health.

SUMMARY, CONCLUSION AND RECOMMENDATIONS : CHAPTER SIX

The effects of sexually transmitted diseases are numerous, having socio-economic, cultural, health, and even political effects. They are a major global cause of acute illness, infertility, long-term disability and death with serious medical and psychological consequences of millions of men, women and infants. This illustrates the public health importance of STI.

World statistics show that the total number of new cases in 2008 was 498.9 million with Africa Region recording 92.6 million. The prevalence rate for various diseases ranged from 2.3% to 20.2% for STIs such as Neisseria gonorrhoea Trichomonas vaginalis among women. In view of the adverse effects of STI, these prevalent rates portrays the health risk of STI. Leonard Sagan, using historical data collected from 150 countries spanning the gamut from pre-modern to the post-modern societies found that by far the most consistently powerful predictor of life expectancy was the prevalence of literacy. Indeed the association of literacy to health abounds in many researches and have been reported repeatedly.

Literacy and education are seen as the bedrock of every nation. Indeed any nation with minimal education of its people and or with only a fewer people educated has found it inimical to their progress as a society in all spheres – economic and culture as well. Health literacy is not an individual problem; it is a societal problem. People face numerous challenges as they seek health information. These include the complexity of the health systems, the rising burden of chronic disease, the need to engage as partners in their care, and the proliferation of consumer information available from numerous and diverse sources. It is estimated that Ghana's literacy rate is 57.9% (2011 est.), a reduction from 76.9% in 2005. This is so in spite of the fact that there is a compulsory education for nine years for every child.

Flowing from the above, It is to be appreciated that low literacy could influence STI related care at any age group. The relationship between literacy, stigmatization for STI is quite multifaceted and even more complex in Ghana. While people with low literacy might experience a strong sense of stigma, they might also be branded by society as 'immoral' without any recourse to the mode of transmission of these STIs. In as much as the sexual behaviour of the young and also the old have become unruly, one begins to wonder about the effect of education on sexual behaviour of persons. Among the cosmopolitan population, there is a comparative reduction of unexpected pregnancies but that same cannot be said boldly about contraction of STIs.

The motivation to study the influences of health literacy and sexually transmitted infections emanates from the fact the there is a high rate of infection of STIs (read from Latif *et al*, 1986) and an associated death toll globally (Lauristen *et al.*, 1997). Developing nations such as Ghana with less medical facilities, and insufficient funds to engage in massive literacy education usually have higher than average rates. With improvement in literacy levels, researchers should be concerned about the mismatch between efforts on improved access to education and the increasing or rather *non – reducing* phenomena of STIs. The objective of the study therefore was to find out the level of student knowledge of sexually transmitted infections, their health literacy level, and establish the relationship between education and health literacy and the influences of health literacy on sexually transmitted diseases. Study results show showed an appreciable high level of health literacy, and a healthy attitude towards STIs.

The study – a case study – in the University Ghana employed quantitative methods using a survey approach to sample views from female students from various academic levels and across the humanities and Science disciplines.

Results show that students understanding of STIs conformed to global definitions. Their knowledge was high in terms of the cause of STIs, and prevention but needed to improve on knowledge about the symptoms and type of STIs. Abstinence was noted as the commonest mode of prevention and only 2.3% of female students have had an STI before, reflecting prevalence rates in the Africa region. The study also found that 90% of female students showed Adequate functional health literacy as oppose to 6.7% who showed Inadequate Functional health literacy. This was higher than the national average for literacy, estimated in 2005. Nonetheless, the current study which used academic levels of students as a measure of educational level showed that there is no significant variation of health literacy among different academic levels. This result, which is at variance with other studies, might be explained by the lack of variation in the educational levels of students in this study. Health literacy association with attitudes towards STI and sexual health was a weak albeit a negative one. This however, suggests that high literacy level led to a healthy attitude toward STI. Other results showed that students, very few though, who have had Gonorrhoea, Genital herpes and Candidiasis sought treatment mostly in the hospital or clinic but also used the herbalist. The use of either a hospital (modern methods) or herbalist (indigenous method) illustrates the importance of social interaction in influencing the patterns in treatment of STIs as has been noted by the World health Organisation.

Recommendations

An important recommendation is to develop the knowledge about STIs among the female students of the University of Ghana. This could be pursued by raising awareness and building capacity of the students. This is against the background that students did not show prolific knowledge of the symptoms of STIs, and neither did they know the many types of STIs. Not knowing the symptoms of a disease could

increase the risk of dying or suffering from that disease when it becomes advanced. Knowledge of symptoms which could be pursued through an increased education through modules in STI taught to students is likely to improve attitudes and decrease any form of risk of contraction.

Recommendation for further research could involve sampling participants from very distinct educational strata and factoring in the aspect of culture to determine the role it plays in attitudes towards STIs given education and health literacy levels.

REFERENCES

Adler, N.E., Newman, K. (2002). Socioeconomic disparities in health: pathways and policies, *Health Aff (Millwood), 21, 60–76.*

Allensworth, D. (1993) Health education: state of the art. *Journal of School Health, 63, 14–20*

Australian Bureau of Statistics (2006). *Health Literacy*, Australia: Australian Bureau of Statistics

Backlund, E., Sorlie, P.D., Johnson, N.J. (1999). A comparison of the relationships of education and income with mortality: the National Longitudinal Mortality Study. *Soc Sci Med. 49:1373–84.*

Baker, D.W., Williams, M.V., Parker, R.M., Gazmararian, J.A., Nurss, J. (1999). Development of a brief test to measure functional health literacy. *Patient Educ Couns, 38(1):33- 42.*

Barragan, M, Hicks, G., Williams, M.V., Franco-Paredes, C., Duffus, W. and del Rio, C. (2005). Low health literacy is associated with HIV test acceptance. *J Gen Intern Med., 20,422-425*

Beitchman, J.H., Wilson, B., and Douglas, L. (2001). Substance use disorders in young adults with and without LD: Predictive and concurrent relationships. *Journal of Learning Disabilities, 34, 317-332*

Bennett, C.L., Ferreira. N.R., Davis, T.C., Kaplan, J., Weinberger, M., Kuzel, T. et al (1998). Relationship between literacy, race and stage of presentation among low income patients with prostate cancer. *J Clin Oncol. 16:3101–3104*

Bostock, S. (2012). Association between low functional health literacy and mortality in older adults: longitudinal cohort study. *BMJ 2012;344:1602*

Cameron, I. and McBride, N. (1995) Creating health promoting schools: lessons from the west Australian school health project. *Health Promotion Journal of Australia, 5, 4–10.*

Canadian Education Research Information System (CERIS) (1999). Literacy: Definitions. Available at http://www.schoolnet.ca/ceris/e/literacy1.html.

Chan, A. (2013). STI Epidemic: Nearly 20 MIllion Sexually Transmitted Infections in the U.S. Each Year, Researchers Find. Available at http://www.huffingtonpost.com/2013/02/14/sti-epidemic_n_2681134.html

Centre for Diseases Control (CDC) (2013). CDC Fact Sheet: Incidence, Prevalence, and Cost of Sexually Transmitted Infections in the United States. Available at http://www.cdc.gov/std/stats/STI-Estimates-Fact-Sheet-Feb-2013.pdf

Centre for Disease Control and Prevention (CDC). (2011). Health Communication Basics. Available at http://www.cdc.gov/healthcommunication/healthbasics/whatishc.html

Centre for Literacy of Quebec. (2000). A Working Definition: Literacy for the 21st Century. The Center for Literacy of Quebec, Montreal, Quebec, Canada. Available at http://www.nald.ca/litcent.html.

Collins, J.W. and O'Brien, N. P., (eds). (2003). *The Greenwood dictionary of education*. Westport, CT: Greenwood.

Comings, J., Garner, B. and Smith, C. (2007). *Review of Adult Learning and Literacy: Connecting Research, Policy, and Practice Vol 7*. New Jersey: Lawrence Erlbaum Associates, Inc., Publishers

Davis, T.C., Long, S.W., Jackson, R.H., Mayeaux, E.J., George, R.B., Murphy, P.W. and Crouch M.A. (1993). Rapid estimate of adult literacy in medicine: a shortened screening instrument. *Fam Med 25(6)*:391-5.

DeRose, R. F. (2012). *Breaking the Chain of Disease*. Bloomington: iUniverse

Devaney, B., Schochet, P., Thornton, C., Fasciano, N. and Gavin, A. (1993) Eventuality of the Effects of School Health Interventions on School Performance: Design Report. Mathematica Policy Research, Inc., Princeton, NJ.

DeWalt, D. and Hink, A. (2009). Health literacy and child health outcomes; A systematic review of the literature. *Pediatrics, 124, S264-S274.*

ECOSOC Annual Ministerial Review (2009). Regional Preparatory Meeting on promoting Health literacy. Beijing, China

Elston, R. and Johnson, W. (1994). *Populations, samples and study design. In: Essentials of biostatistics (2nd ed*). Philadelphia: Davis.

Evans, R., Barer, M. and Marmor, T. (eds) (1994). *Why are some people healthy and other not? The determinants of Health of populations*. New York: Aldine de Gruyter.

Farne, H., Norris-Cervetto, E. and Warbrick-Smith, J. (2010). *Oxford Cases in Medicine and Surgery*. Oxford: Oxford University Press

Ferguson, L. A., & Pawlak, R. (2011). Health literacy: The road to improved health outcomes. *The Journal for Nurse Practitioners, 7, 123-129.*

Fletcher, J., Shaywitz, S., Shankweiler, D., Katz, L., Liberman, I., Stuebing, et al. (1994). Cognitive profiles of reading disability: Comparisons of discrepancy and low achievement definitions. *Journal of Educational Psychology, 86, 6-23*

Fortenberry, M., Hennesey, B., Grimley, et al. (2001). Relation of health literacy to gonorrhoea related care, *Sex Transm Infect 2001;77:206-211* doi:10.1136/sti.77.3.206

Friere, P. (1985). *The politics of Education: Culture, power and liberation*. Basingstoke, NH: Macmillan

Friere, P. and Macedo, D. (1987). *Literacy: Reading the word and the world*. MA: Bergin & Farvey Publishers

Gans, A. M., Kenny, M. C., & Ghany, D. L. (2003). Comparing the self concept of students with and without learning disabilities. *Journal of Learning Disabilities, 36, 287-296*

Gausman, B. J., Forman, W.B. (2002). Comprehension of written health care information in an affluent geriatric retirement community: use of the Test of Functional Health Literacy. *Gerontology.48 (2):93–7*.

Gazmararian, J., Curran, J., Parker, R., Bernhardt, J., & DeBuono, B. (2005). Public health literacy in America: An ethical imperative. *American Journal of Preventative Medicine, 28(3), 317-322*.

Ghana Ministry of Education, Science and Sports2008, The development and state of the art of adult learning and education (ALE): National report of Ghana, UNESCO UIL, Hamburg. Available at http://www.unesco.org/fileadmin/MULTIMEDIA/INSTITUTES/UIL/confintea/pdf/National_Reports/Africa/Africa/Ghana.pdf

Grosse, R. N. and Aufrey, C. (1989), Literacy and health status of developing countries. *Annual Review of Public Health, 10: 281 - 297*

Guzzetti, B. J., Donna, E. A., and Jerry L. J., (eds) (2002). *Literacy in America: An encyclopaedia of history, theory, and practice*. Santa Barbara, CA: ABC-Clio.

Harvard school of Public health, (2013). Health Literacy Studies. Available at http://www.hsph.harvard.edu/healthliteracy/overview/

Health Canada (1999). Toward a healthy future: second report on health of Canadians. Available at http://www.hc-sc.gc.ca/hppb/phdd/report/text_versions/english/index.html

Hoang, G. and Erickson, R. (1985). Cultural barriers to effective medical care among Indochinese patients. *Ann Rev Med. 36,229–39.*

Huisman, M., Kunst, A.E., Bopp, M., Borgan, J.K., Borrell, C., Costa, G., et al (2005). Educational inequalities in cause-specific mortality in middle-aged and older men and women in eight western European populations. *Lancet 365,493–500*

Hunt, S. D., Sparkman, R. D. and Wilcox, J.B. (1982). The pretest in survey research: Issues and Preliminary findings. *Journal of Marketing Research. 19 (2).*

Hussey, J. and Hussey, R. (1997). *Business Research: A practical guide for undergraduate and postgraduate students*. Basingstoke: Macmillan

Igoe, J. B. (1993) *Healthier children through empowerment. In Wilson-Barnett, J. and Macleod-Clark, J. (eds) Research in Health Promotion and Nursing*. Macmillan, Basingstoke.

IOM. (2004). Health Literacy: A Prescription to End Confusion. Iom.int

Jarvis, P. (1999). *International dictionary of adult and continuing education. (2d ed).* London: Kogan Page

Kalichman, S.C., Ramachandran, B and Catz, S (1999). Adherence to combination antiretroviral therapies in HIV patients with low health literacy. *J Gen Intern Med. 14(5):315–7.*

Kalichman, S. C. and Rompa, D. (2000). Functional Health literacy is associated with health status and health-related knowledge in people living with HIV-AIDS. *Journal of Acquired Immune Deficiency Syndromes and human Retrovirology, 25(4), 337-344*

Kansas Head Start Association. (2012). Health Literacy. Retrieved from http://www.kheadstart.org/node/90

Kickbusch, I. S. (2001). Health literacy: addressing the health and education divide. *Health Promotion Int. 6 (3):289-297*

Kickbusch, I., Wait, S. and Maag, D. (2005) Navigating Health: The Role of Health Literacy. Available at www.emhf.org

Kimball, R.S. (1999). *Life Skills Literacy: Things to Know about Medicine and Health*. Portland: Western Walch

Krejcie, R.V.,& Morgan, D.W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*. Inc. Sage Publication

Kutner, M.A., Greenberg, E. Jin, Y. and Paulsen, C. (2006). The health literacy of America's adults. A presentation at the meeting of minds II symposium. American Institute of research. Available at http://www.calpro-online.org/researchtopractice/MoM2ppt/markKutnerPlenary.pdf

Lannin, D.R. et al (1998). Influence of socioeconomic and cultural factors on racial differences in late-stage presentation of breast cancer. *JAMA.279(2),1801–7*

Latif, A.S., Marowa, E., Maison, P. R. et al (1986). Treatment of infection due to penicillinase-producing Neisseria gonorrhoeae with oral thiamphenicol and with oral lymecine. *Sex Transm Dis 13,156*

Lavin, A. T., Shapiro, G. R. and Weill, K. S. (1992). Creating an agenda for school-based health promotion: a review of 25 selected reports. *Journal of School Health, 62, 212–229*

Marmot, M. (2002).The influence of income on health: views of an epidemiologist. *Health Aff (Millwood) 21,31–46.*

Mayaud, P. and McCormick, D. (2001). Interventions against sexually transmitted infections (STI) to prevent HIV infection. *British Medical Bulletin, 58 (1), 129-153.*

McBride, H., & Siegel, L.S. (1997). Learning disabilities and adolescent suicide. *Journal of Learning Disabilities, 30, 652-659*

Mehrotra, C. M. and Wagner, L.S. (2009). *Aging and Diversity: An active learning Experience (2nd Ed)*. New York: Routledge

Mitic, W. and Rootman, I. (ed) (2012). An inter-sectoral approach for improving health literacy for Canadians. Discussion paper, Public health Association of British Columbia.

Myers, M.D. (2009). *Qualitative Research in Business and Management*. London: Sage Publications.

Nancy, S. C. (2011). Health literacy, sexually transmitted infection (STI) knowledge and protective sexual behaviour. A dissertation presented to the Teachers College, Columbia University for the award of PhD.

National Network of Libraries of Medicine. (2012). Health Literacy. Accessed at http://nnlm.gov/outreach/consumer/hlthlit.html

Needham, H. E., Wiemann, C. M., Tortolero, S. R. and Chacko, M. R. (2006). Health literacy, reading comprehension, and risk for sexually transmitted infections (STIs) in young women: Are they related? *Journal of Adolescent Health, 38 (2), 93-111*. Elsevier

NHS (2013). Sexually transmitted infections (STIs). Accessible at http://www.nhs.uk/conditions/Sexually-transmitted-infections/Pages/Introduction.aspx

North Carolina Program on Health Literacy (2011). What is Health Literacy? Available at http://www.nchealthliteracy.org/about.html

Nurss, J. R., Parker, R.M., Baker, D.W. (1995). *TOFHLA: Test of functional health literacy in adults*. Peppercorn Books and Press, Inc

Nutbeam, D. (2000). Health literacy as a public health goal: A challenge for contemporary health education and communication strategies into the 21st century. *Health Promotion International, 15(3), 259-267*

Nutbeam, D., Wise, M., Bauman, A., Harris, E. and Leeder, S. (1993) *Goals and targets for Australia's health in the year 2000 and beyond*. AGPS, Canberra.

Nutbeam, D. (2008). The evolving concept of health literacy. *Social Science and Medicine, 67(12), 2072 - 2078*

Nwadinigwe, I. P. (2002). *Fundamentals of Research Methods and Statistics*. Lagos: Vitaman Educational Books and Publishers

O'Donnell, M. P. (ed) (2001). *Health promotion in the workplace (3rd Ed)*. USA: Thomson Learning Inc.

Paasche-Orlow, M., & Wolf, M. (2007). The causal pathways linking health literacy to health outcomes. *American Journal of Health Behavior, 37(Suppl), SI 9—S26.*

Parker, R. (2000). Health Literacy: a challenge for American patients and their health care providers. *Health promotion International, 15, 277-283*

Parker, R.M., Baker, D.W., Williams, M.V., Nurss, J.R. (1995). The test of functional health literacy in adults - A new instrument for measuring patients literacy skills. *Journal of General Internal Medicine 10(10),537-41*.

Pattman, K.N., Sankar, N., Elawad, B. P., Handy, P. and Price, D. A. ed.(2010). *Oxford Handbook of Genitourinary Medicine, HIV, and Sexual Health*. Oxford: Oxford University Press

Peerson, A and Saunders, M. (2009). Health literacy revisited: what do we mean and why does it matter? *Health Promotion International, Vol. 24 No. 3, 285-296*

Pfizer Inc (1998). Promoting Health Literacy: a call to action. Conference proceedings. Pfizer Inc, New York, USA.

Polin, R. A. and Ditmar, M. F. (2011). *Paediatric Secrets (5th Ed)*. Elsevier

Rogstad, K. E. (ed)(2011). *ABC of Sexually Transmitted Infections (6th Ed).* Wiley-Blackwell

Ronson, B. and Rootman, I. (2004). Literacy: one of the most important determinants of health. In: D. Raphael, (ed.), *Social determinants of health: Canadian perspectives (1st ed)*. Toronto, ON: Canadian Scholars' Press, pp. 139-169.

Rootman, I., & Ronson, B. (2003). Literacy and health research in Canada: Where have we been and where should we go? *Can J Public Health.,96 Suppl 2:S62-77.*

Rudd, R, Kirsch, I. and Yamamoto, K. (2004). Literacy and Health in America. Policy Information Report. Policy Information Center, Educational Testing Service (ETS)

Rudd, R., Anderson, J. E., Oppenheimer, S. and Nath, C. (2007). *Health Literacy; An updated review of the medical and public health literature. Annual review of Adult learning and literacy*, *Volume* 7. Mahwah, NJ: Lawrence Erbaum Associates;

Rutherford, J., Holman, R., MacDonald, J, et al. (2006). Low literacy: a hidden problem in family planning clinics. *J Fam Plann Reprod Health Care,32(4):235–40.*

Sabornie, E.J. (1994). Social-affective characteristics in early adolescents identified as learning disabled and nondisabled. *Learning Disabilities Quarterly, 17, 268-279*

Sagan, L. A. (1987). *The health of nations: true causes of sickness and well-being*. New York: Basic Books

Schillnger, D., Grumbach, K., Piette, J., Wang, F., Osmond, D., Daher, C., Palacios, J., Sullivan, G.D., Bindman, A.B. (2002). Association of health literacy with diabetes outcomes. *JAMA. 2002; 288: 475–482*.

Shaw, S. J. Huebner, C. Armin, J. Orzech, K. and Vivian, J. (2008). The Role of Culture in health literacy and chronic disease screening and management. *Journal of Immigrant Minority Health. DOI 10.1007/s10903-008-9149-z* Springer.

Silke, C. (2005). Health Literacy and Internet: Recommendations to promote Health Literacy by the means of the Internet, EuroHealthNet. Accessed at http://eurohealthnet.eu/sites/eurohealthnet.eu/files/publications/pu_8.pdf

Small, E. (2009). *Relationships and Social Influences as Predictors of Adolescent condom use*. USA: Proquest LLC

Sonnex, C. (1996). *A General Practitioner's Guide to Genitourinary Medicine and Sexual Health*. Cambridge: Cambridge University Press.

Sorensen, K. (2011). Health literacy as outcome of corporate social responsibility practice. CSR Europe. Available at http://www.csreurope.org/data/files/CollaborativeProject_public_docs/HealthLiteracy/HL_study_report_-_Maastricht_University-Final.pdf

Sorlie, P.D., Backlund, E., Keller, J.B. (1995).US mortality by economic, demographic, and social characteristics: the National Longitudinal Mortality Study. *Am J Public Health. 85:949–56.*

St Leger, L. and Nutbeam, D. (2000) A model for mapping linkages between health and education agencies to improve school health. *Journal of School Health, 70, 45–50*

St. Leger, L. (2001). School, health literacy and public health: Possibilities and Challenges. *Health Promotion International, 16, 197 - 205*

Suppes (1970). In De Vaus, D. A. (2001). *Research Design in social Research,* London: Sage Publications

United States Department of Health and Human Services. (2000). *Healthy People 2010: Understanding and Improving Health*. US Government Printing Office, Washington, DC. www.healthypeople/gov

United Nations Population Fund and Population Reference Bureau, (2010). Country profiles for population and reproductive health: Policy development and Indicators 2009/2010. UNFPA and PRB

UNESCO Institute for Statistics. Functional Literacy. UNESCO.

UNIADS, UNICEF and WHO. (2004). Epidemiological fact sheets on HIV/AIDS and Sexually transmitted infections: 2004 update. Accessed at http://data.unaids.org/Publications/Fact-Sheets01/ghana_EN.pdf

Uppaluri, C.R., Schumm, L.P. and Lauderdale, D.S. (2001). Self-reports of stress in Asian immigrants: effects of ethnicity and acculturation. *Ethn Dis. 11(1):107–14.*

Verhoeven, L. (ed) (1994). *Functional Literacy: Theoretical Issues and Educational Implications.* Amsterdam: John Benjamins Publishing Co.

Waldie, K., & Spreen, O. (1993). The relationship between learning disabilities and persisting delinquency. *Journal of Learning Disabilities, 6, 417-423*

Wallerstein, N and Bernstein, E. (1994). Introduction to community empowerment, participatory education and health. *Health Education quarterly, 21, 141-148*

Weiss, B.D., Mays, M.Z., Martz, W., Castro, K.M., DeWalt, D.A., Pignone M.P. et al (2005). Quick assessment of literacy in primary care: the newest vital sign. *Ann Fam Med, 3(6),514-22.*

Wharf Higgins, J., Begoray, D. and MacDonald, M. (2009). A social ecological conceptual framework for understanding adolescent health literacy in the health education classroom. *American Journal of Community Psychology, 44, 350 - 362*

WHO/ UNAIDS (1999).Sexually transmitted diseases: policies and principles for prevention and care. Available at http://www.unaids.org/en/media/unaids/contentassets/dataimport/publications/irc-pub04/una97-6_en.pdf

WHO (2011). Sexually transmitted infections. Fact sheet. Available at http://www.who.int/mediacentre/factsheets/fs110/en/

WHO (2012). *Global incidence and prevalence of selected curable sexually transmitted infections – 2008*. World Health Organisation

WHO (2013). Health topics: Sexually transmitted infections. Accessible at http://www.who.int/topics/sexually_transmitted_infections/en/

World Bank, (2000). *World development report1999/2000. Entering the 21st century: the changing development landscape*. New York: Oxford University Press.

World Bank (1993) *World Development Report 1993. Investing in Health*. Oxford University Press, Oxford

World Health Organization (1996). *The Status of School Health*. WHO, Geneva

Yin, R. K. (1989). *Case Study research Design: design and methods (Revised Edition*). London: Sage publications

Zikmund, W. G. (1991). *Business Research Methods (3rd ed.). Chicago*: The Dryden Press

Websites

http://www.state.gov/r/pa/ei/bgn/2860.htm

Official website of Ghana Statistical Service (2007)

http://abcnewsradioonline.com/health-news/tag/health-literacy

National centre for education statistics official website: NCES.ed.gov

http://www.ccl-cca.ca/CCL/Reports/HealthLiteracy/HealthLiteracy2007.html#sthash.fuwiYrEm.dpuf

UN Chronicle: Health Literacy and sustainable Development. http://www.un.org/wcm/content/site/chronicle/cache/bypass/home/archive/issues2009/healthliteracyandsustainabledevelopment

APPENDICES

Appendix 2a

INFORMED CONSENT FORM

My name is Angela Abroso a student at the University of Ghana Business School. As part of my programme requirement, I am working on a project titled: **Health Literacy and Sexually Transmitted Infections (STIs) among University of Ghana Female Students.** I am therefore asking if you would agree to participate in my research by answering a questionnaire.

The questionnaire has (38) questions and a passage on health literacy which should take about (25) minutes to complete.

You do not have to participate at all, or, even if you agree now, you can terminate your participation at any time without prejudice. You also do not have to answer individual questions you don't want to answer. Your name will not be attached to the questionnaire and I will ensure that your participation remains confidential. (This consent form will be kept separate from the questionnaire for all participants.)

I can tell you that your response may be included in the paper I will write at the conclusion of this assignment; however, your responses would be anonymous and nobody could connect your responses with you as an individual and will be used strictly for academic purposes.

A benefit you may experience by participating in this study is greater knowledge of your perceptions/feelings about STIs.

By participating in this study, you risk being upset or made uncomfortable by the questions asked.

If you have any questions or concerns, please feel free to contact me at angeladjeiley@yahoo.com and on 0242928021.

_____ _____

Participant signature Date

_____ _____

Researcher Signature Date

QUESTIONNAIRE ON:

HEALTH LITERACY AND SEXUALLY TRANSMITTED INFECTIONS (STI'S) AMONG UNIVERSITY OF GHANA FEMALE STUDENTS

1 *Please tick where applicable [√]*

Demographic information

1. Age (in years) a.17 – 20 [ ] b.21 - 23 [ ] c.24 - 26 [ ] d.27 – 30 [ ] e.31 - 35 [ ] f. 36 and above [ ]
2. Religion; a. Christian [ ] b. Muslim [ ] c. Traditionalist [ ] d. Other Specify [ ]
3. Relationship status:
   a. Single [ ] b. Dating [ ] c. Married [ ] d. Separated/ divorce [ ]
   e. Co- habiting [ ]
4. If you are currently single have you ever had a partner or boyfriend before?

   Yes [ ] No [ ]
5. Academic Level:
   a. L100 [ ] b. L200 [ ] c. L300 [ ] d. L400 [ ] e.L600 [ ]
6. Since primary education, how many years have you spent in school so far? _____
7. Programme of study - _____

KNOWLEDGE ON SEX, SEXUAL RELATIONSHIP AND STIs

8. What do you understand by the word Sexually Transmitted Infections (STIs)?

……

9. How is it contracted?

……

10. Can STI be avoided/prevented? Yes [ ], No [ ]

11. If yes, list the methods of STI prevention that you know and your source of Information.

Method	Source of information
a. ……..	…….
b. ……..	…….
c. ……	…….
d. ……	…….

12. Have you ever heard about diseases that can be transmitted through sex?

Yes [ ], No [ ]

13. If yes, what was your source of information?

T.V [ ], Radio [ ], Newspaper/magazine [ ], Peer group [ ], School teachers [ ],

Family members [ ], Health worker [ ],

Others (specify) ……..

14. Which of the following sexually transmitted disease do you know?

Gonorrhea [ ], Syphilis [ ], AIDS/HIV [ ], Genital herpes [ ], Chancroid [ ],

Others (specify) ……

15. Do you know the signs and symptoms of sexuality transmitted diseases?

Yes [ ], No [ ]

16. If yes, list three (3) you know

a) ……., b)……, c) ……

17. Have you ever suffered from any of the following?

Pain during urination [ ], Lower abdominal pain [ ],

Urethra/vaginal discharge [ ], Ulcer (wound) in your private part [ ]

ATTITUDE TOWARDS STI AND SEXUAL HEALTH

Attitude towards STI and sexual health

19. Please state your opinion on using a scale of 1 to 5 where 1 signify strongly disagree and 5 strong agreement to the following statements

Rating scale: Not probably/ strongly disagree ← [1] [2] [3] [4] [5] → strongly agree/ Most probable

i.	I often have casual sex	[1] [2] [3] [4] [5]
ii.	If I know my partner have possibly had sex with someone, I will not really insist on a condom	[1] [2] [3] [4] [5]
iii.	In a community where there is less infection with STIs, I will not mind having sex without a condom	[1] [2] [3] [4] [5]
iv.	If I see thrush or rashes on my sexual partners organ or around it, so far as he's wearing a condom, I will have sex with him	[1] [2] [3] [4] [5]
v.	I have sex (and this could be with anyone) when I'm frustrated or depressed or angry	[1] [2] [3] [4] [5]
vi.	If my partner has an STI, I will not have sex w ith him, but I could give him a deep kiss	[1] [2] [3] [4] [5]
vii.	I love to experiment with sex and various sexual positions	[1] [2] [3] [4] [5]
viii.	Depending on the type of STI my partner has, I might have sex with him	[1] [2] [3] [4] [5]
ix.	With an infection of candidiasis, I might still have sex with my partner	[1] [2] [3] [4] [5]
x.	If I have sores in my mouth, I will still kiss my sexual partner	[1] [2] [3] [4] [5]
xi.	In case of STI I would go in for oral sex	[1] [2] [3] [4] [5]
xii.	In case of an STI I would rather go in for anal sex	[1] [2] [3] [4] [5]
xiii.	I don't mind taking in alcohol and feeling tipsy before or during sex	[1] [2] [3] [4] [5]
xiv.	I would rather douche to clean out any germs or infection after having sex	[1] [2] [3] [4] [5]

TREATMENT

30. Have you ever had any sexually transmitted diseases? Yes [ ], No [ ]

31. If yes, which one did you have? ……

32. Did you seek treatment? Yes [ ], No [ ]

33. If yes, where did you seek treatment? ……

34. When you had this disease, did you inform your parent(s)?

Yes [ ], No [ ]

37. Have you ever used any method of sexually transmitted disease prevention?

Yes [ ], No [ ]

38. If yes, which of these methods have you used? Condoms/diaphragm[ ],

Abstinence [ ], Avoid sex with prostitutes [ ], Avoid sex with strangers [ ],

Others (specify) ……..

Health Literacy

Instructions: The following are some other medical instructions that you or anybody might see around the hospital. These instructions are in sentences that have some of the words missing. Where a word is missing, a blank line is drawn, and 4 possible words that could go in the blank appear just below it. I want you to figure out which of those 4 words should go in the blank, which word makes the sentence make sense. When you think you know which one it is, circle the letter in front of that word, and go on to the next one. When you finish the page, turn the page and keep going until you finish all the pages.

Passage A – X-RAY PREPARATION

Your doctor has sent you to have a _____ X-ray. You must have an _____ stomach when you

a. Stomach	a. Asthma
b. Diabetes	b. Empty
c. Stiches	c. Incest
d. germs	d. anemia

come for ____. The X-ray will _____ from 1 to 3 _____ to do. For supper have only a _____

a. is	a. take	a. beds	a. little
b. am	b. view	b. brains	b. broth
c. if	c. talk	c. hours	c. attack
d. it	d. look	d. diets	d. nausea

snack of fruit ____ and jelly with coffee or tea. After _____ ,you must not _____ or drink anything

a. toes	a. minute	a. easy	
b. throat	b. midnight	b. ate	
c. toast	c. during	c. drank	
d. thigh	d. before	d. eat	

at _____ until after you have ____ the X-ray. Do not eat _____. Do not eat _____,

a. ill	a. are	a. appointment	a. drive,
b. all	b. has	b. walk-in	b. drink,
c. each	c. had	c. breakfast	c. dress
d. any	d. was	d. clinic	d. dose

even _____. If you have any _____ , call the X-ray _____ at 0302 22222

a. heart	a. answers	a. Department	
b. breath	b. exercises	b. Sprain	
c. water	c. tracts	c. Pharmacy	
d. cancer	d. questions	d. Toothache	

Passage B: MEDICAL CARE (NHIS) RIGHTS AND RESPONSIBILITIES

I agree to give correct information to ____ if I can receive Medical care. I _____ to provide the country information

a. hair	a. agree	
b. salt	b. probe	
c. see	c. send	
d. ache	d. gain	

to _____ any statements given in this _____ and hereby give permission to the _____

a. hide	a. emphysema	a. inflammation
b. risk	b. application	b. religion
c. discharge	c. gallbladder	c. iron
d. prove	d. relationship	d. country

to get such proof. I _____ that for NHIS I must report any _____ in my circumstances within _____

a. investigate
b. entertain
c. understand
d. establish

a. changes
b. hormones
c. antacids
d. charges

a. three
b. one
c. five
d. ten

(10) days of _____ of the _____ if I DO NOT like the _____ becoming change. I understand

a. award
b. aware
c. away
d. await

a. thus
b. this
c. that
d. than

a. marital
b. occupation
c. adult
d. decision

made on my _____ to a fair _____ a hearing by _____ case, I have hearing. the I can

a. bright
b. left
c. wrong
d. right

a. request
b. refuse
c. fail
d. mend

a. counting
b. reading
c. calling
d. smelling

the district when _____ special treatment _____ , you will have to _____ a I applied. If you for any family

a. wash
b. want
c. cover
d. tape

a. member
b. history
c. weight
d. seatbelt

a. relax
b. break
c. inhale
d. sign

different application _____ , we will use t _____ on this form to _____. form. he determine your

a. Since,
b. Whether
c. However,
d. Because

a. lung
b. date
c. meal
d. pelvic

a. hypoglycemia
b. eligibility
c. osteoporosis
d. schizophrenia

Numeracy Test

NUMERACY ITEM 1(*Label on prescription bottle*)

Take one tablet by mount every 6 hours as needed.

ORAL QUESTION: If you take your first tablet at 7:00 a.m., when should you take the next one?

Answer: _____

NUMERACY ITEM 2(*Prompt card*)
Normal blood sugar is 60–150. Your blood sugar today is 160.

ORAL QUESTION: If this was your score, would your blood sugar be normal today?

Answer: _____

NUMERACY ITEM 3(Prompt card)

CLINIC APPOINTMENT				
CLINIC: Diabetic			LOCATION: 3rd floor	
DAY: Thurs.	DATE: April 2nd		HOUR: 10:20	a.m. / p.m.
Issued by:				
YOU MUST BRING YOUR PLASTIC CARD WITH YOU				

ORAL QUESTION: When is your next appointment?

Answer: _____

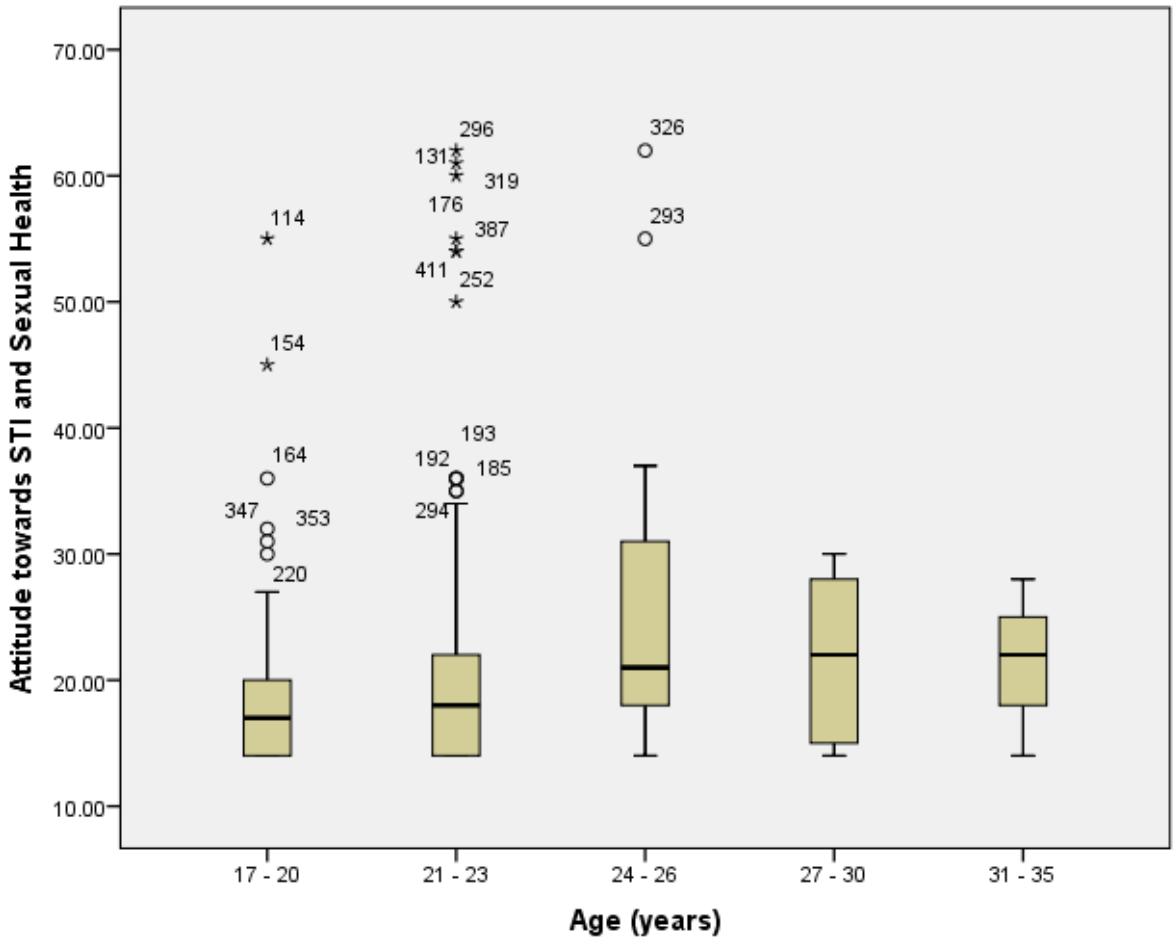
NUMERACY ITEM 4(*Label on prescription bottle*)

Take medication on empty stomach one hour before or two to three hours after a meal unless otherwise directed by your doctor.

ORAL QUESTION: If you eat lunch at 12:00 noon, and you want to take this medicine before lunch, what time should you take it?

Answer: _____

Appendix 2b



Appendix 2c
Multiple Comparisons

Dependent Variable: Attitude towards STI and Sexual Health
LSD

(I) Age (years)	(J) Age (years)	Mean Difference (I-J)	Std. Error	Sig.
17 - 20	21 - 23	-1.99464*	.85121	.020
	24 - 26	-6.39270*	1.40924	.000
21 - 23	24 - 26	-4.39806*	1.34380	.001

*. The mean difference is significant at the 0.05 level.

Appendix 2D
Multiple Comparisons
Dependent Variable: Attitude towards STI and Sexual Health
LSD

(I) Academic level	(J) Academic level	Mean Difference (I-J)	Std. Error	Sig.
Level 100	Level 400	-3.61186*	1.23340	.004
	Level 300	-2.59396*	1.16976	.027

*. The mean difference is significant at the 0.05 level.

Appendix 2e

Cross-tabulation of Age (years) and Health literacy levels

		Health literacy levels			Total
		Inadequate Functional health literacy	Marginal Functional health literacy	Adequate health literacy	
Age (years)	17 - 20	10 34.5%	5 35.7%	126 32.6%	141 32.8%
	21 - 23	16 55.2%	5 35.7%	213 55.0%	234 54.4%
	24 - 26	2 6.9%	3 21.4%	37 9.6%	42 9.8%
	27 - 30	1 3.4%	0 0.0%	8 2.1%	9 2.1%
	31 - 35	0 0.0%	1 7.1%	3 0.8%	4 0.9%
Total		29 100.0%	14 100.0%	387 100.0%	430 100.0%

Appendix 2f

Cross-tabulation of Academic level and Health literacy levels

		Health literacy levels			Total
		Inadequate Functional health literacy	Marginal Functional health literacy	Adequate health literacy	
Academic level	Level 100	4 14.8%	2 14.3%	85 22.3%	91 21.5%
	Level 200	13 48.1%	7 50.0%	126 33.0%	146 34.5%
	Level 300	3 11.1%	2 14.3%	97 25.4%	102 24.1%
	Level 400	7 25.9%	3 21.4%	72 18.8%	82 19.4%
	Level 600	0 0.0%	0 0.0%	2 0.5%	2 0.5%
Total		27 100.0%	14 100.0%	382 100.0%	423 100.0%