ENSIGN COLLEGE OF PUBLIC HEALTH, KPONG EASTERN REGION, GHANA

PERCEPTIONS AND ATTITUDES TOWARDS VAGINAL CANDIDIASIS INFECTION A SURVEY AMONG FEMALE STUDENTS IN SELECTED SENIOR HIGH SCHOOLS IN THE LOWER MANYA MUNICIPALITY IN THE EASTERN REGION OF GHANA

BY

GERALD ODURO

A Thesis submitted to the Department of Community Health in the Faculty of Public Health in partial fulfillment of the requirements for the award of

MASTER OF PUBLIC HEALTH

JULY 2017

PERCEPTIONS AND ATTITUDES TOWARDS VAGINAL CANDIDIASIS INFECTION A SURVEY AMONG FEMALE STUDENTS IN SELECTED SENIOR HIGH SCHOOLS IN THE LOWER MANYA MUNICIPALITY IN THE EASTERN REGION OF GHANA

DECLARATION

I hereby certify that except for the reference to other people's work, which I have duly cited, this Project submitted to the Department of Community Health, Ensign College of Public Health, Kpong is the result of my investigation, and has not been presented for any other degree elsewhere.

Gerald Oduro (ID -157100026): _____ _____

(Student) Signature Date

(Certified by)

Dr Frank E. Baiden: _____ _____

(Supervisor) Signature Date

(Certified by)

Dr Stephen Manortey: _____ _____

(Ag. Head of Academic Program) Signature Date

DEDICATION

I dedicate this work to my wife Agnes, children and siblings who have been my source of encouragement.

ACKNOWLEDGEMENT

I am profoundly grateful to the Almighty God for His grace and mercy showed me throughout this study.

I thank my academic supervisor, Dr. Frank E. Baiden for his guidance and support throughout this study. I am also thankful to the officials of the Ghana Education Service at Lower Manya Krobe Municipality, all the heads of the selected schools as well as all the female students who took part in the study.

DEFINITION OF TERMS

VC: Vaginal Candidiasis

VC is an infection of the vagina involving overgrowth of yeast, or fungus, known as Candida.

Perception about VC: is defined as the respondent's beliefs about the causes, perceived seriousness and, perceived susceptibility to the risk of VC.

Knowledge of VC: is defined respondent's information about the signs, symptoms, causes and health-seeking options for VC.

LIST OF ABBREVIATIONS/ACRONYMS

VC – Vaginal Candidiasis

GES – Ghana Education Service

WHO – World Health Organization

ABSTRACT

Introduction

Vaginal Candidiasis (VC) is a common infection in women. In Ghana effective prevention and treatment among adolescents is hindered by the persistence of myths and the lack of knowledge about causes. A possible platform for intervention is the Ghana Health Service School Health Education Program (SHEP) currently in place in public schools.

Methods

This study is a cross-sectional study that used a self-administered questionnaire to explore knowledge and attitude towards VC among students in five (three public and two public) selected senior high Schools in the Lower Manya Krobo Municipality in the Eastern Region of Ghana. Data was collected on the socio-demographic background of students, their knowledge of the causes and symptoms of VC, as well as common misconceptions about the infection. Data analysis using STATA 14 was descriptive and explorative. Determinants of the practice of douching and the myth that all women have candidiasis were explored using chi-square.

Results

Four hundred and fifty (450) respondents between the ages 13 to 25 years with a mean age of 17(standard deviation 1.6) years participated in the survey. About 73.3% of students admitted to having had VC, and 95.3% believed that eating sugary foods was among the cases of VC. The prevalence of douching was 51.3%. About 76.9% of students believed that all women naturally have VC. Students in the two private institutions were more likely to practice douching than

students in the three public schools (P-value<0.01). Similarly, students in Forms 2 and 3 were progressively less likely to douche (p=0.02) than students in Form 1. Curiously students in Forms 2 and 3 were more likely to believe that all women naturally suffered from VC (p=0.04). There was no significant association between believing that all women naturally suffered from VC and the practice of douching.

Conclusion

The high prevalence of VC, misconceptions about it and the practice of douching require that Education on VC be prioritized and specifically included in the curriculum of SHSs. The SHEP needs to be extended to private SHSs in the study area.

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF MAPSUU

LIST APPENDICES

CHAPTER 1

1.0 INTRODUCTION

Schools can make a substantial contribution to a student's health and well-being. An initiative was launched by the World Health Organization in 1995 to improve the health of students in schools through School Health Programs, which are designed strategically to prevent significant health risks among the youth.

The principal focus of these programs is the prevention of the leading causes of disease, disability, and death among the youth. This preventive program includes conditions such as, HIV/AIDS/, STDs, Genital Infections, and other Health-related behaviors such as drugs and alcohol usage, violence and injuries, unhealthy nutrition (WHO, 2016).This initiative was also adopted by the School Health Education Program (SHEP) in Ghana (Nelleke, 2008). Established in1992 with the objective of providing health education to schools, it has currently grown both in significance and scope, adjusting to the changes and achieving some measurable success. Improving the reproductive health of adolescent female students is a major agenda for the school health program.

1.1 Background

Common among the diseases that affect students in Ghana is Vaginal Candidiasis (VC). VC is Commonly known to female students in Senior High Schools (SHS) as "white," and in the Akan

culture as “odepua” is an infection of the vagina involving the overgrowth of yeast or fungus that belongs to the Genus Candida. Yeast infections produce a thick or watery white discharge from the vagina which often has no odor and usually cause the vagina and vulva to become itchy and inflamed.

According to Georgiev (2003), there are some 200 organism species within the Genus Candida. However, only 15 of these species are isolated from patients as infectious agents. Out of these Candida Albicans, Candida glabrata, Candida Tropicalis, Candida Parapsilosis, Candida Krusei, and Candida Lusitaniae are the most commonly associated with human infections (D. M. MacCallum 2014).

Five out of these six species (Candida Albicans, C. Glabrata, C. Tropicalis, C. Parapsilosis, and C. Krusei) account for 92% of all cases of Candidiasis. However, their distributions vary in population-based studies conducted in different geographical areas (Clinical Microbiology and Infection, 2014). Candida Albicans is the most common cause of Candidiasis worldwide accounting for 62% of all cases (Pfaller M. A, & Diekema D.J, 1999).

Among different regions in Africa, the percentage of Candida Albicans infections is very high in the Sub-Saharan and Central African Regions (22.74%) followed by the South African Region (22.44%), and Northern Africa (20.16%), (Omrani1, Pecen, Hajek, Raghubir& Zigmond 2014).

The variety of species including C. Albicans, C. Glabrata, C. Tropicalis, Candida Dubliniensis, C. Krusei, Candida Guilliermondii and C. Parapsilosis have recently been described in samples taken

from patients in teaching hospitals in Ghana, and it is reported as lying prevalence(Feglo & Narkwa, 2012). Most Candida infections occur on epithelial surfaces such as in the mouth, nail, vagina, and skin regions (Segal, 2004).

Globally 75% of women will suffer from VC at least once in their lifetime. Virtually 40% to 50% worldwide experience multiple infections (Pfaller &Diekema, 1999). The prevalence rate is estimated at twenty-two percent (22%).This percentage is similar in both adults and adolescent females (Barrousse &Pol, 2004).

In Africa, the prevalence rate ranges between 1 -35percent, with infections being the highest in North African countries (31.22%). In West Africa, the rate of detection of Candida spp. from HVS/ECS specimens was found to be 29.1% (n = 2458) in Jos and Oyelese in Ile-Ife, 24% among STDs over a ten year period (Oyelese et al., 2005) in Nigeria.

21% prevalence rate has been recorded in studies conducted in Ghana. (Abruquah, 2012). It has also been argued that the information on the incidence of VC does not always reflect the real situation regarding this disease since the frequency of patient's self-treatment remains high (Farage, et al. 2005, Dozenko, 2006).The misconception about the causes and treatments of VC has led to the abuse of antibiotics, the unregulated use of antibiotics results in drug resistance and increasing mortality and morbidity from infectious diseases (Hart & Kariuki 1998).

Douching is a common practice among females as a means of treating VC, but this practice rather upsets the normal balance of yeast in the vagina and does more harm than good (Gale 2011). The use of perfumed soaps, shower gels, and vaginal deodorants, herbal preparations for washing the vagina which eventually kill the organisms that protect the lining of the vagina (Sowa 2013).

Early detection and treatment of VC are suggested to have better treatment outcome and thus regarded as the best therapy. Later treatment lowers the chances of successful cure of the infection. But it is mostly reported later or never due to a lack of knowledge, and the negative attitudes toward the disease. Self-reported history of VC among students is reported to be 20%, (Foxman B.1990) while a proportion of 45%, was recorded in a sampled population (Reed, Slattery& French,1989) and 72% recorded in family practice clinic users (Berge, Heidrich, & Fihn, 1984).

1.2 Problem Statement

Candida infection of the vagina is a common problem that causes significant morbidity and affects the well-being of females (Asticcioli et al., 2009). This yeast infection colonizes the body tissues by releasing powerful chemicals into the bloodstream causing such varying symptoms as lethargy, chronic diarrhea, Vaginitis, bladder infections, muscle and joint pain, menstrual problems, constipation, and severe depression. There is the need for this to be treated early, aggressively, and appropriately (Infectious Diseases Society of America, 2014)

VC is a second most common infection after Bacterial Vaginitis (Bacterial Vaginitis (40%–45%), VC (20% -25%), Trichomoniasis (15%–20% (CDC virginities). The diagnosis was in up to 40% of women with vaginal complaints in the primary care setting (Anderson, Klink, & Cohrssen 2004). Research study on "the investigation of Candida Albicans infection among teenagers (between the ages of 13-19)" at the Tamale Teaching Hospital had shown that the prevalence of Candida Albicans infection among adolescents who reported to the Hospital with vaginal discharge problems was 43.33% (Enwuru, Ogunledun, &Idika, 2008).

This prevalence rate among teenagers should be of concern to all. Our school health programs are planned towards STIs with very few studies conducted in Ghana to assess the knowledge, perceptions, and attitudes towards VC among Senior High School students. A good understanding of the perceptions and attitudes will enable interventions to be instituted within the school health program to ensure early detection and treatment, and to avoid long-term complications.

This study, therefore, seeks to examine the knowledge, perceptions, attitudes and health-seeking behavior among the female students in the five secondary schools in the Lower Manya Krobo Municipal in the Eastern Region of Ghana.

1.3 Rationale of Study

Even though VC is widespread in occurrence, many females are embarrassed by this problem. There is, therefore, the need for some basic education about its causes, treatment, and prevention (Peter G. Pappas, 2016).

Findings from this study will help school policy program planners, to understand the knowledge, perceptions, attitudes and health- seeking behaviors of VC among the female students. It will contribute to improving policy development and programs planned towards female sexuality, thereby prevent significant important health risks among youth. Additionally, the study findings will also provide data on the knowledge level, perceptions, and attitudes towards early detection of VC which can be used as a basis for subsequent academic research.

Goal

To improve the sexual and reproductive health of female students in Senior High Schools in the Lower Manya municipal in the Eastern Region of Ghana.

Aim

To assess the knowledge and attitude towards VC in the five government Senior High Schools in the Lower Manya Municipal in the Eastern Region of Ghana.

1.4 Hypothesis/Conceptual framework

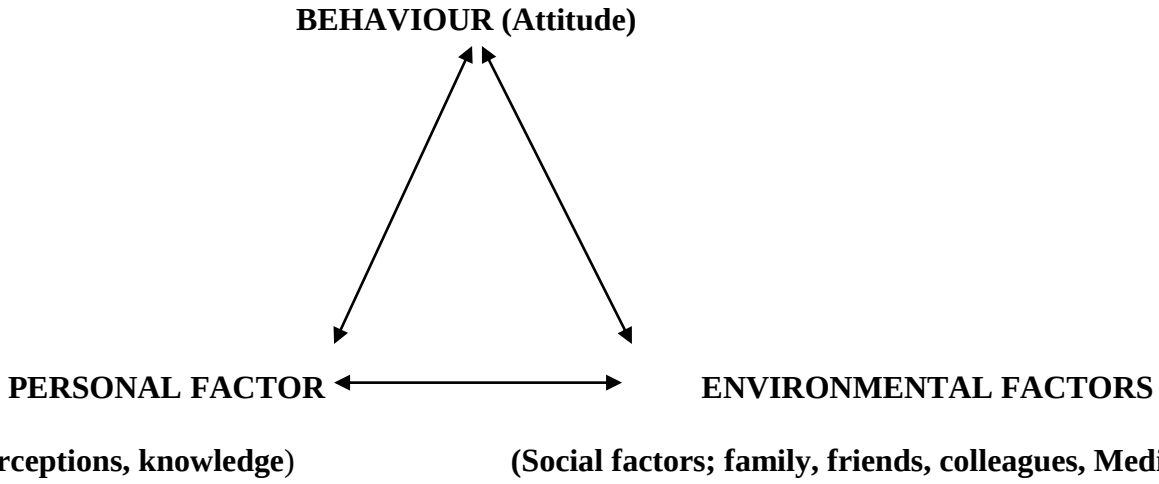


Figure 1: The Social Cognitive Theory

Source: Bandura (1986)

This study will adopt the Social Cognitive Theory (SCT) as a conceptual framework for examining how perceptions and attitudes influence VC infection among SHS students. The perceptions held by the person about the causes, perceived seriousness, perceived susceptibility to the risk of VC, perceived pain, and embarrassment. The outcome of VC treatment may influence a person's behavior towards VC. The personal factor looks at the knowledge on the signs, symptoms, causes, and the availability of information and the benefits of early treatment or health-seeking options (Yeboah-Asiamah, B., 2015). Knowledge of the health risk and benefits of health practices is one of the core determinants of behavior change (Bandura, 2004; Short, James & Plotnikoff, 2013).

Therefore, it suggested that high knowledge on VC will translate into good perceptions and in turn, positive health- seeking behavior change.

For this study, the environmental factors will focus on the influence of family and friends, and health-seeking behaviors carried out on the various media outlets and by health professionals (Yeboah-Asiamah, B., 2015).

One fundamental principle of the social cognitive theory is observational learning (Bandura, 1986) that is, where a person learns by watching others. These factors may serve as facilitators or barriers. People may receive support and encouragement from experiences shared by family and friends, campaign messages about VC carried out through the various media outlets.

1.5 Research Questions

1. What perceptions do female students have about VC?
2. What knowledge do female students have about the causes, symptoms, and treatment of VC?
3. What are some of the local beliefs and myths about VC?
4. What is the health-seeking behavior towards VC?
5. What are the sources of information for VC?
6. How many female students are douching?

1.6 General Objective

To determine the level of awareness of VC as an infection.

1.7 Specific Objectives

To assess knowledge of the causes of VC.

To determine the prevalence of douching among students.

To examine perceptions of VC among female students

To identify local beliefs and myths about VC.

To make recommendations on how effective VC prevention and treatment that can be incorporated into the School Health Education Programs.

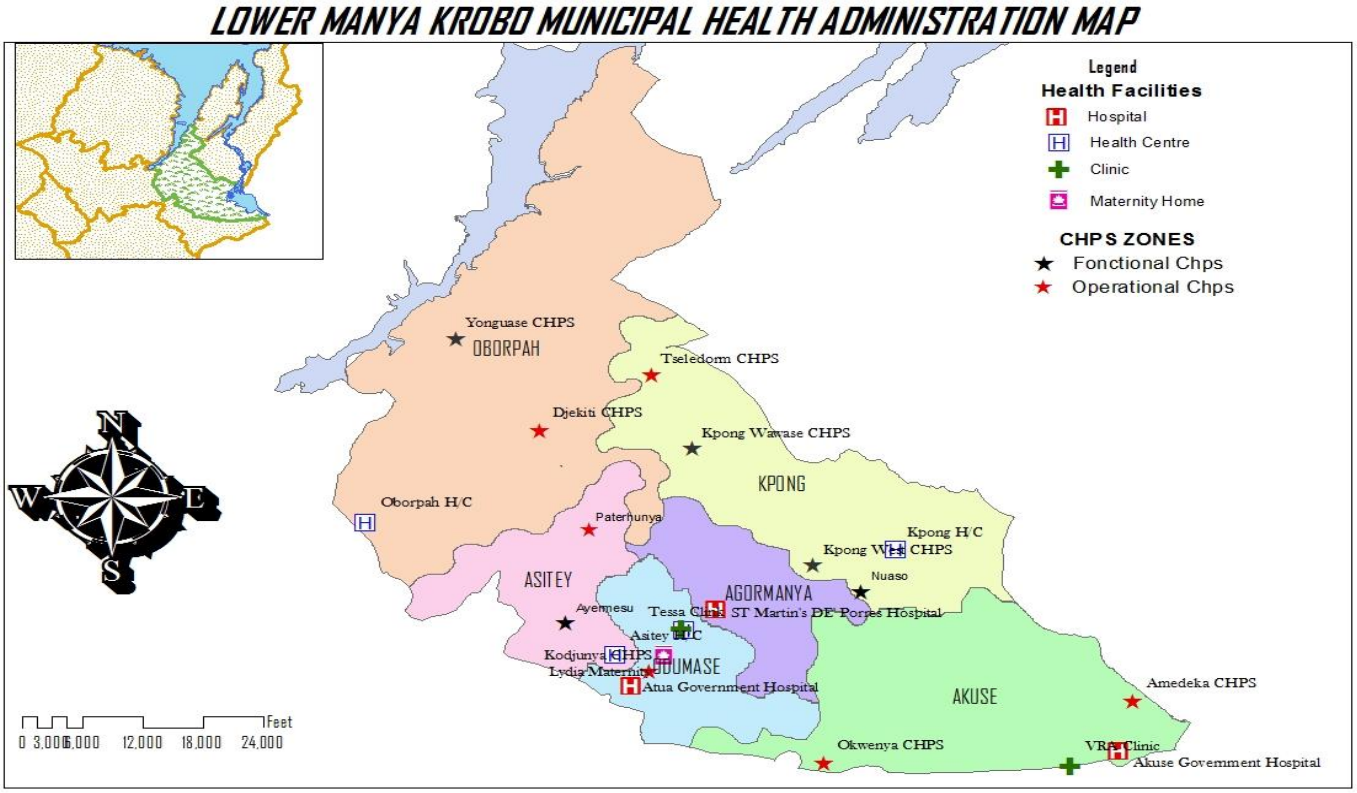
1.8 Profile of the study area

The Lower Manya Kobo Municipal (LMKM) is one of the 26 administrative districts in the Eastern Region of Ghana. The Municipal came into existence as result of the split of the then Manya Krobo District into Lower and Upper Manya Krobo in 2008. It was later elevated to a Municipality status in July 2012 by a Legislative Instrument (L.I.) 4026.

Location

The Municipality is strategically located at the Eastern corner of the Eastern Region of Ghana, and it lies between latitude 6.05N and 6.30N and longitude 0o08W and 0.20W with an altitude of 457.5m above sea level. The Municipality is bounded on the North-west by Upper Manya Krobo District, on the North-east by Asuogyaman district, on the South-east by North Tongu District and the South by Yilo and Dangme West District. The LMKM covers an area of 304.4 square kilometers, with a population density of 293.2 persons per square kilometer.

Map 1: Lower Manya Krobo Municipal Health Administration Map



Population by size, sex, and type of locality

The estimated total population of the Lower Manya Krobo Municipality according to the 2010 PHC is 89,246 representing 3.4% of the entire population of the Eastern Region. The fertility rate for the municipality is 3.0 as compared to the Eastern Regional average of 3.5.The proportion of males to females is 41,470 (46.5%) to 47,776 (53.5%). The Municipality has a youthful population of 35.1 percent of the population below 15 years

The major towns in the district include Odumase Townships made up Atua, Agormanya, Nuaso and Akuse and Kpong in the Lower Manya area. (Population and Housing Census,2010).

Ethnicity and Religion

The population of the district is heterogeneous regarding ethnicity and religion. The predominant ethnic group is Krobos (70.5%). Followed by the Ewes (18.2%), and Akans (7.7%), and Other ethnic groups make up the remaining portion of the population (3.6%). The dominant religion is Christianity (92.8%), followed by Islamic (3.7%) and Traditionalist (2.6%) respectively. There also exist smaller groups of people who adhere to other religions or have no religion. (Population and housing census 2010)

Physical features

The district is relatively flat to the southeast with isolated hills to the northeast. The landscape is undulating with several streams, most of which drain into the Volta lake. The climate is typically tropical with the major rainy season from March to July and the minor season from September to October. Annual rainfall varies from 1303.4mm in June to 165.6mm in September. Average temperature ranges from 12.2ºC (rainy season) to 40ºC (dry season). The moderate temperature

and humidity and the double maxima rainfall have a bearing on population growth and the environment. The vegetation falls within the dry semi-deciduous (fire zone) and dry deciduous (inner zone) forest. There are four forest reserves in the district, which occupy about 60sqkm of land. They are Volta River Block 1, Yongua, Sapawa and Aboden forest reserves.

Health facility and health status

There are two(2) Public and one(1) Private Hospitals , one(1) Public and two(2) clinics, four(4) RCH centers , twenty-two CHPS zones, ,one(1) private maternity home nine(9)TBA ,fifty-one (51)CBS.

The top ten diseases commonly recorded in the district in order of a high number of cases to lower some cases at the OPD are Rheumatism and Joint pains, Malaria, Acute Respiratory Infection, Anemia, Diarrhea, Skin Diseases and Ulcer, Typhoid Fever, Intestinal Worms, Hypertension, Vaginal Discharges and Others.

A vaginal discharge which is one of the symptoms of VC was the nine commonest in the municipal.

School facilities

The district is blessed with a total of four (4) Public Senior High School and four (4) Private Senior High School, three (3) Vocational and Technical Schools and one (1) Tertiary Institution.

1.9 Scope of Study

This study explores the sources of information, knowledge of the causes, signs, symptoms, perceptions and attitudes towards VC infection among female students in five selected Senior High Schools in the Lower Manya Municipal in the Eastern Region of Ghana.

1.10 Organization of Report

The research work will be put into six chapters. Chapter one deals with the background of the study, statement of the problem, the rationale of study, hypothesis/conceptual framework, research questions, general objectives, specific objectives, the profile of study area, and organization of the report. Chapter two examined related literature on VC infection by looking at the theoretical framework and empirical basis for the study. Chapter three describes the methodology used in the study. This section has subsections of research design, population and sample size and procedures, data collection instrument, and data collection procedure and data analysis. The Chapter four is concerned with the presentation and discussion of the result of the study. Under this chapter, we have an analysis of the response from student's different schools. Chapter five looks at the discussions on the findings. The final chapter of the research deals with the summary of the findings, conclusion, and recommendations.

CHAPTER 2

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter discusses the clinical features, the epidemiology and risk factors, finding from previous studies which include the perceived risk, perceived causes, and severity, knowledge sources of information and attitudes towards VC.

Clinical features and Epidemiology of VC

The vagina is a dynamic ecosystem that usually contains approximately 10^9 bacterial colony-forming units per gram of vaginal fluid. The normal vaginal discharge is clear to white, odorless, and of high viscosity. Lactobacilli dominate the normal bacterial flora, but a variety of other organisms, including some potential pathogens, are also present at lower levels. Lactobacilli convert glycogen to lactic acid. Lactic acid helps to maintain a normal acidic vaginal pH of 3.8 to 4.2. The acidic environment and other host immune factors inhibit the overgrowth of bacteria and other organisms with pathogenic potential. Some lactobacilli also produce hydrogen peroxide (H_2O_2), a potent microbicide that kills bacteria and viruses. Disruption of normal vaginal ecology or host immunity can predispose it to vaginal yeast infections. The symptomatic clinical disease occurs with excessive growth of yeast. There are two classifications, Uncomplicated, sporadic or infrequent VC or complicated recurrent VC (Vaginitis Module 2013, Shannon Johnson, 2015; Health line Media, 2016).

Symptoms recognized at the developed phase of the disease include vulvar pruritis, (a persistent itch around the vulva which is the area around the vagina causing distress) (. Thick, white, curdy vaginal discharge ("cottage cheese-like"), Erythema, (superficial reddening of the skin, irritation causing dilation of the blood capillaries), occasional erythematous ("satellite" lesion), External dysuria, and dyspareunia (CDC vaginitis 2013).

A case study, of the incidence and risk factors of VC in a Girls' Senior High School in Bolgatanga in Ghana, revealed that vaginal itching is the most common symptom among participants who tested positive for VC with a percentage of 30.0, followed by a burning sensation (29.2%), vaginal discharge (28.3%) and irritation (27.3%). (Essel, Amenga-Etego& Quaye 2014)

Their finding was consistent with other findings which also reported pruritus or itching (85.5%) as the most common symptom followed by vaginal discharge (66.1%),(Gregarious, Baka&makrakis,2006).

In India, Ahmad and Khan also reported in their work that the most common signs and symptoms in 215 women with VC infection were pruritis or itch with or without vaginal discharge and vaginal erythematic and inflammation. (Ahmad & Khan, 2009.)

VC is the second most common cause of Vaginitis in the United States with an estimated cost of $1 billion annually (CDC-2013) and is the most common cause in Europe. (Obstet Gynecol-1985).

In Africa, Candida Albicans which is the primary cause of VC is estimated to be 23% among the different regions.

In Ghana, a research study conducted on the prevalence and antifungal susceptibility of Candida species isolated from females seeing a gynecologist at the Komfo Anokye Hospital in Kumasi

showed that the prevalence of VC among women was 21%. Candida Albicans was the most common yeast isolated from high vaginal swabs followed by Candida Glabrata (Abruquah, 2012).

Risk factors of VC

The widespread use of antibiotics has been suggested as one of the major factors contributing to the rising incidence of VC. But evidence supporting this hypothesis has been limited (Xu &Sobel, 2003).Existing data on the risk of developing antibiotic-associated VC are conflicting. (Foxman, Marsh, Gillespie &Sobel, 1998; Reed, 1992; Geiger& Foxman, 2000).Results from a prospective study of 250 pregnant women concluded that extensive antibiotic use posed little risk for the development of yeast infection (Glover & Larsen, 1998). Some case-control studies found no evidence of an association between antibiotic agents and symptomatic VC, whereas others reached an opposite conclusion (Spinillo, Capuzzo, Acciano, Santolo, Zara &Leegaard, 1984). But a case-control study ,on the effect of antibiotics on VC by Jinping Xu and others involving eighty female between 19and 62 years of age, with 44 women in the antibiotic group and 36 in the control group found out that, a short course of oral antibiotics was associated with both increased prevalence of positive VC colonization and increased incidence of symptomatic VC during 4 to 6 weeks of using antibiotic therapy (Jinping, Kendra, et al. 2007)

According to one theory, Candida cells have estrogen and progesterone receptors which when stimulated increase fungal proliferation (Reed, 1992) among women who are pregnant or those who are taking a high dosage of estrogen. Many studies show that the use of oral contraceptives was linked with an increased risk of VC infections. It is because almost all oral contraceptives are

a combination of synthetic estrogens and progestin's thus they add a constant level of excess estrogen. A study Ahmad and Khan in 2009 in India involving over a thousand women found out that 57.5% of oral contraceptive users had VC infection as compared to only 11.8% of non-users. Increase in estrogen level during ovulation and among females also helps the growth of candida.

A Spanish researcher Relloso and others published data in 2012 in which they found out that an increase in estrogen during ovulation and period impairs the immune response against Candida. Indicating that estrogen helps Candida growth in environments that would otherwise have been bad for it. Also, research by Zhang and colleagues published in 2000 showed that when candida, is exposed to estrogen, it grew better and could even survive unfavorable conditions such as temperatures as high as 48^{o}C.

The use of spermicidal and condoms was associated with a greater risk of VC infections. McGroarty and others from Canada reported in 1990 that this association is due to the spermicidal compound nonoxynol-9 (N9) which increases the adhesion of Candida to the cells. Watts and colleagues also found out that N9 hurts the normal flora of the vagina Poor personal hygiene can make a female more susceptible to Candida infection by increasing the numbers of Candida in the vagina. Intimate practices like "wiping back" to front" can allow candida from the gut to colonize the vagina and this may be considered as one of the major sources of candida. A 2009 Indian study by Ahmad and Khan found out that 36.5%of women with poor genital hygiene had vaginal candida infection as compared to only of women with good as compared to only 15.6% of women with good genital hygiene.

Many investigators have suggested that VC occurs more frequently in people with diabetes (Bohannon, 1998; Zdolsek, Hellberg, Fröman, Nilsson, &Mårdh, 1998) with several studies also reporting an increased rate of asymptomatic vaginal carriage rates of Candida species and the incidence of symptomatic infection in diabetic women. But the results have not been consistent (Williams, Knight, King &Harris, 1975, Gibb, Hockey, Brown, Lunt, 1995). However, in-vitro studies demonstrating impaired host response directed against Candida in people with diabetes supported the idea of increased rates of Candida colonization among people with diabetes (Segal& Soroka, 1984; Schechter, Wilson & Reeves, 1986).

A cross-sectional study among female diabetes patients receiving care at one of two diabetes clinics described the associations between Candida colonization among diabetes type and severity among others. The study concluded that Candida carriage increases with old age and women with type 1 and type 2diabetes might be equally likely to acquire Candida, but those with type 1 may be less able to clear it (Leon, Jacober, Sobel &Foxman, 2002). Also, a study by Leon and colleagues which were published in 2002 also showed that people with type I diabetes (insulin dependent) are three times more likely to have excessive Candida as compared to those with type 2 diabetes (not insulin dependent).

An impaired immune system is also a great risk. Females with lowered immunity such as from corticosteroid therapy or HIV infection are more likely to get yeast infections.(Sydnor, 2011). A review article published in 2005 by Cunningham-Rundles, McNeeley, and Moon describes the mechanisms by which nutritional deficiency can cause lowered immunity. A 1986 study by Edman, Sobel, and Taylor showed clearly that women with recurrent Vaginal Candida infection

had significantly lower zinc levels in the blood.Deficiency of vitamin A also leads to lowered mucosal immunity and could be one of the reasons that can lead to VC infections. Vitamin A, beta-carotene, folic acid, vitamin B12, vitamin C, riboflavin, iron, zinc, and selenium affect our immunity, and lack of these can cause decreased immunity and increased susceptibility to infections.

Chronic stress leads to suppressed immune system. A meta-analysis of 300 research studies was done jointly by Segerstrom and Miller in 2004. This 2004 study showed convincingly that, under chronic stress, immunity afforded to us by both the immune cells and the antibodies were suppressed.

Although yeast infections is not considered as Sexually Transmitted Infections, Sexual contact can also spread the Candida fungus (Mayo, 2015). One study found identical Candida strains in the sexual partners of 48 percent of women with recurrent infections (O'Connor&Sobel, 1986). Studies have also shown that oral sex increases almost five-fold the risk of vaginal colonization with Candida. It facilitates transmission of yeast as Candida .often colonizes the oral cavity (Barlow, d'Arcy, Gillepsie&Sobel, 2000; Otero, Palacio, Carreño, Méndez& Vázquez, 1998)One study demonstrated a positive relationship between the monthly frequency of sexual intercourse and the incidence of recurrent VC(Spinillo, Pizzoli, Colonna, Nicola, De Seta& Guaschino, 1993).
The prevalence of colonization of C. Albicans had been reported to be higher in young individuals with a tongue piercing, in comparison to unpierced matched individuals(Yehuda, Burnstein, Estella, Vadim, Clariel&Tamar, 2010).Douching has also become a common practice among

females (Gale, 2011). The use of perfumed soaps, shower gels, and vaginal deodorants, herbal preparations (NHS, 2013).Dietary habits have been suggested as a cause of recurrent VC.

However most studies do not support a role of dietary factors in the etiology of recurrences and adherence to strict diets has not been beneficial(Reed,1992).But Samaranayake and MacFarlane from Scotland (1987) found out in their study that dietary carbohydrates had an effect on adherence of Candida cells to epithelial cells which line all tissues and organs. They also found out that when Candida grows in the presence of certain carbohydrates, its ability to adhere to the epithelial cells is significantly increased. Implying eating sugary and starchy staff can also make you more susceptible to VC infections not only by reducing your immunity but also by increasing the adherence of Candida to the vaginal cells. Sanchez and colleagues found out in their 1973 that after consuming 100g sugar, the immune cells called phagocytes had very reduced function 1-2 hours after consumption. The effect lasted up to 5 hours after sugar intake.

Irritation of the vaginal area by clothing or sexual intercourse may also predispose already colonized areas to infection. Using tight and poorly ventilated clothes or using synthetic underwear increases the risk of getting Vaginal Candidiasis. Neves and colleagues found out in a 2005 study that synthetic underwear could cause an allergic reaction that changes the vaginal environment leading to VC infections.

Perception about VC

Perception of VC for the study is defined as the beliefs held about the causes, perceived seriousness, and perceived susceptibility to risk.

In using the Self-Regulatory Model, there may be a group of perceptions which have an effect on attitudes toward diagnosis and treatment of a disease. These perceptions include the perceived name that is given to the disease. Its manifestations, perception about how long the disease last, beliefs about what causes the disease and the perceived effects the disease has on the individuals' life and viewpoint of the length of time that an individual can treat the disease (Traeger et al., 2009; Hevey et al., 2009). People's views about the cause of any particular disease may determine whether or not a health problem is thought to be preventable (Smith et al., 1999)Perception about the cause includes the belief that only adults get the yeast infection. Yeast exists in everyone's body, and just like in adults, the right conditions can cause overgrowth and lead to an infection in any age group (Chrisiliades, 2014). Bang and Bang also reported that in India, they found out that women believed the consumption of `hot' food could aggravate `heat' in the body and thus lead to white discharge (Bang &Bang, 1994).

Diverse perceptions of the severity of VC has been expressed. Many authors report that recurrent VC, for instance, can result in significant morbidity, serious social consequences, and profoundly distressing deterioration in the quality of life (Sobel, 1993).

A study among South Asian women showed their perceptions and experiences of VC about the quality of life. Some women felt a constant need to scratch, which made it difficult for them to conceal their condition in public situations the symptoms can make the woman feel dirty, itchy and embarrassed (Chapple, 2001).

Knowledge about VC

Knowledge about VC is defined , as having adequate information about the symptoms, causes, and health-seeking options of the disease.

Proper education of teenagers, adolescents, and young adults could be useful in the control of VC (Barousseet al., 2004; Eckert et al., 1998; Ononge et al., 2005). A study conducted at the University of Abuja Teaching Hospital, Gwagwalada, Abuja, on the prevalence of VC among non-pregnant women with 200 participating subjects, the prevalence was found to be 14% in comparison to with other studies, the relatively low prevalence of VC among women attending the Teaching Hospital was attributed to adequate knowledge among others (Anthony Uchenna Emeribe, Idris Abdullahi Nasir, Justus Onyia, Alinwachukwu Loveth Ifunanya)

Sources of information about VC

The information obtained about VC helps to increase the awareness and knowledge levels, demystifies certain perceptions about the disease, and helps develop a positive attitude towards VC. According to the social cognitive theory, factors that can influence a person's behavior and thus their attitudes include social and environmental factors. These factors include influence from friends, family, colleagues, and the sources of information (media). Dissemination of this information helps to improve people's knowledge about the disease and also increases risk perceptions (Matthew et al., 2011).

Myths and Beliefs of VC

According to Starkey (1998), myths abound regarding the treatment and cause of VC. Some of these contribute to the anxiety and embarrassment felt by women consulting health professionals about VC, and others cause women unnecessarily to restrict their lives as they follow preventive measures with little or no evidence. Many nurses can recall women who have washed or touched several times a day or used disinfectants in a belief that this will cure or prevent the problem. Some women associate thrush with sexual activity, a belief that can cause anxiety and sexual dysfunction, or mistrust of a partner who they think must have been unfaithful and given them the infection. Such mistaken reactions are understandable, and it is, therefore, important during a consultation to dispel any such myths.

VC is normally an easily recognized and simply treated condition. Many women will treat themselves via the pharmacy or by using non-pharmacological interventions. However, nurses should be wary of dismissing patients who have VC, particularly in its recurrent form, as having a minor problem. Care should always be taken to ensure any underlying precipitating factors have not been missed. Women suffering from VC should be dealt with empathetically. Many feel embarrassed about their condition and nurses are ideally placed to offer relevant health education that will improve patients' understanding of their condition, to reassure them and to offer advice that will help them reduce its recurrence (Smaje, 1996).

CHAPTER 3

3.0 METHODOLOGY

3.1 Study Design

The study is a cross-sectional study conducted among female students in five senior high schools in Lower Manya Krobo Municipality. Quantitative data collection approach and a structured questionnaire were used to collect data on socio-demographic factors, perceptions about VC, knowledge about VC, attitude toward VC and health seeking behavior towards VC.

3.2 Data collection technique/method and tools

The data collection tool for this study was a structured questionnaire. The questionnaire was developed based on the objectives of the study and also based on the reviewed literature. It was composed of closed-ended questions intended to answer the research questions.

3.3 Study Population

The study involved female students in five selected senior high schools in the Lower Manya municipal. This includes the Manya Krobo Senior High School a government school (Macrosec) located at Nuaso with a female population of 1242, King David College a private school at Okwenya with a female population of 350, Akro Senior High and Technical school a government (Akrosec) at Odumase female population of 847, Krobo Girls Presbyterian School a government school at Odumase a female population 2200 and Modern Senior High School a private school at

kpong with a female population of in the Lower Manya Municipal. The total number of female students for all the five schools was proximately 4739. This study population was selected based on the fact VC is usually associated with females. The public and private schools were chosen as the focus because students in these schools are properly documented.

3.4 Study Variables

Dependent variable

Perceptions of VC: Respondent's beliefs about the causes, perceived seriousness, and perceived susceptibility to the risk of VC.

Attitude towards *VC***:** Respondent's health seeking behavior towards VC

Independent variables;

Socio-demographic: Age, form, Ethnicity, Religion, School, Form and Status (Boarding or Day).

Knowledge and Sources of Information: Media, the internet, family/friends, health professionals, books, and journals.

3.5 Sampling

Sampling size estimation

Population survey or descriptive study
For simple random sampling, leave design effect and clusters equal to 1.

Population size:	4739
Expected frequency:	50 %
Confidence limits:	5 %
Design effect:	1.2
Clusters:	5

Confidence Level	Cluster Size	Total Sample
80%	**39**	**195**
90%	**62**	**310**
95%	**86**	**430**
97%	**103**	**515**
99%	**140**	**700**
99.9%	**212**	**1060**
99.99%	**276**	**1380**

The sampling size was estimated using http://www.raosoft.samplesize.html.It was based on the fact that the total number of female students enrolled in all the selected schools at the time of the study was 4739. Assuming the level of awareness of VC as a disease of 50% and non-response rate was 4.5%. The target sample size of 452 was to make it possible to estimate the true prevalence within the margin of error of 5%, at a confidence level of 95%.

The selected schools were clustered into five different clusters using their school names. The proportion of female students were sampled (based on the determined sample size) from each cluster as illustrated by the table below

The proportion female students sampled from each cluster

Name	Number of females students	Number sampled
Manya Krobo	1242	118
King David College	350	33
Akro Senior High and Technical school	847	81
Krobo Girls Presbyterian	2200	210
Modern SHS	100	10
Total	4739	452

In sampling the schools, numbers were assigned to each of the eight (8) Senior High Schools and five (5) of them were randomly selected in a non-replaceable Strategy. The simple random technique was used in selecting the required number of female students from each of the five selected schools. Attempts were made to select students from all the year level.

3.6 Pre-testing

The questionnaire was pre-tested on a sample of 20 female students in the Saint Ann's vocational school. This school used because they share some similarities regarding socio-demographic features with these five Senior high schools. This helped in making modifications to the questionnaire clearer and reliable.

3.7 Data handling

The data was entered into an Excel spreadsheet and exported into STATA 14(StataCorp LP, College Station, TX, USA). Double data entry and cleaning was done to reduce data entry errors.

3.7.1Data Validity and Reliability

All questionnaires returned were checked for mistakes and completeness. Questionnaires with unclear responses or which has missing information that cannot be clarified will excluded.

Statistical method

The statistical analysis was done using STATA 14 (StataCorp LP, College Station, TX, USA). Preliminary analysis was carried out to summarize the data on socio-demographic characteristics of respondents, knowledge on VC, perceptions, attitudes toward VC and sources of information on VC into percentages and frequencies for descriptive purposes.

Knowledge on VC was measured using 14 questions on the causes, signs, and symptoms, whiles Perception about VC was assessed using 16 questions on causes, risk susceptibility factors, severity, and treatment. And Attitudes toward VC were evaluated using four questions. The bivariate analysis was used to examine the association between the variables; multivariate analysis using logistic regression were used to determine the correlation between demographic characteristics and the perception that every woman naturally had VC and the practice of douching.

3.9 Ethical consideration

The researcher sought for ethical clearance from ethical board of the institution Approval from Ghana Education Service and parental consent

3.9.1 Sensitivity

Due to the sensitivity of the topic, trained female, old students of the various schools were trained and used to distribute and help the student to understand the questionnaires.

3.9.2 Confidentiality

The respondents were assured of privacy and confidentiality All information provided by the respondents was kept confidential and data were locked in a cabinet and on the computer system. The name and identity of the respondent were not needed for the study. The information provided was only identified by a code number and was treated strictly confidential. Respondents' name did not appear or was not mentioned in any part of the report of this study.

3.10 Limitations of the study

The study included only female students in the five (5) public and private schools and could not include females from the other public and private schools, although their participation could have further substantiated the results obtained. The study relied on self-report by the respondents and the information given by the respondents could not be verified, there may, therefore, be information bias.

CHAPTER 4

4.0 RESULTS

4.1 Socio-demographic Characteristics of Respondents

Four-hundred and fifty (450) female respondents from five (5) selected schools were interviewed. The ages of the respondents ranged from 13 to 25years. The mean age of the study was 17 (SD± 1.61). The majority of respondents (77.3%) were in the age category of 13 to 17 years. 70.9% of respondents indicated they lived outside the municipal. 56.0% reported that they live with both mother and father, 26.7% Mother only, 5.8% with father only, 9.1% with Guardian, 0.9% with sibling and 1.6% with others

On religious affiliation, 97.56% indicated they were Christians while 2.4% were Muslims.

All the respondents were students in the Senior High School. 46.4% of respondents were students of Krobo Girls SHS, whiles 26.89% were from the Manya Krobo SHS; 17.1% from the Akro Technical SHS, 7.6% from King David SHS and 2% from Modern SHS. 38.2 % of the respondents were in form one (1); 38.7% in form two (2) and 23.1% Form three. Most of the respondents (77.3%) were boarders whiles 22.7% were day students.

Table 4.1 Socio-Demographic Characteristics of Respondents.

Characteristics	Frequency N= 450	Percentage (100%)
Age:		
13-17yrs	**348**	**77.3**
18-22yrs	**99**	**22.0**
23 -25yr	**3**	**0.7**
Residence:		
Outside the municipal	**319**	**70.9**
Within the municipal	**131**	**829.1**
Respondents living with:		
Both mother and father	**252**	**56.0**
Father	**26**	**5.8**
Mother	**120**	**26.7**
Siblings	**4**	**0.9**
Guardian	**41**	**9.1**
others	**7**	**1.6**
Religious affiliation:		
Christianity	**439**	**97.6**
Islam	**11**	**2.4**
Selection per school:		
Akro SHS	**77**	**17.1**
King David SHS	**34**	**7.6**
Krobo Girls SHS	**209**	**46.4**
Manya Krobo SHS	**121**	**26.9**
Modern SHS	**9**	**2.0**
Forms of respondents:		
Form One	**172**	**38.2**
Form two	**174**	**23.1**
Form three	**104**	**38.7**
Status at school:		
Boarder	**348**	**77.3**
Day	**102**	**22.7**

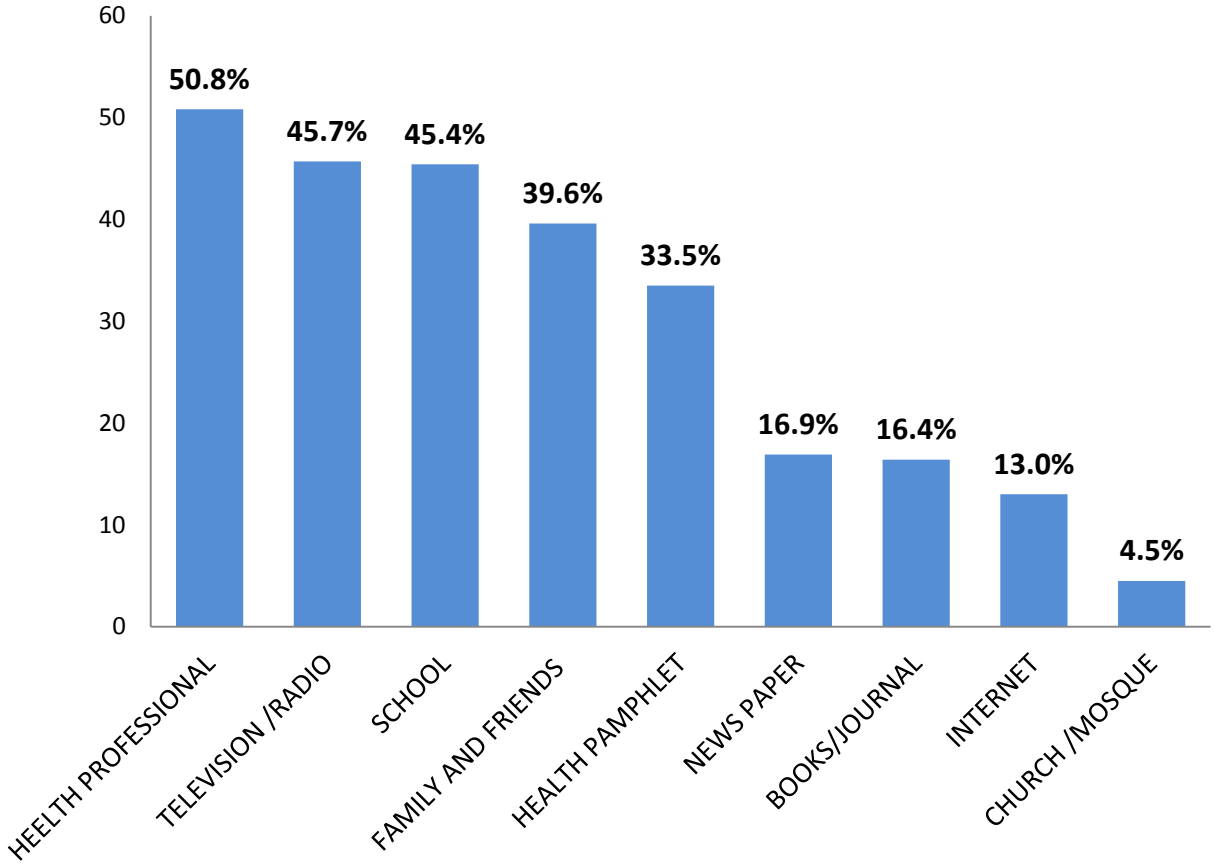
Data are presented in frequency (N) and proportions (%)

4.2 Knowledge on VC

4.2.1 Awareness and Source of Information on VC

The results indicated that majority of the respondents 445 (98.9%) were aware of VC. Out of these, 50.8%, reported having heard about VC from health professionals. While 45.6% indicated the television and radio as their source of information about VC;16.9% indicated newspaper, 33.4% Health pamphlets, 4.5% indicated church and mosque, 13.0% internet, while 95.5% 16.4% books /journals, 39.6% indicated family and friends and 45.4 % school.(Fig 1)

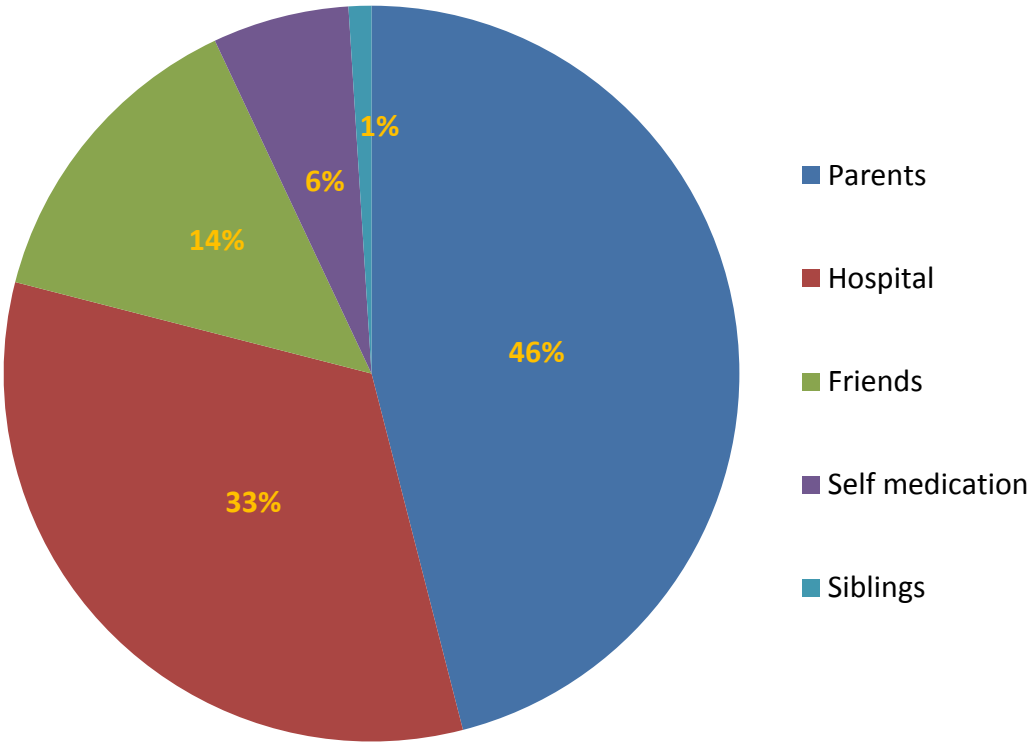
Fig 1: **Awareness and Sources of Information on VC**



A total of 330(73.3%) respondents indicated they have ever been diagnosed of VC . About 46.06% indicated that they were diagnosed by their parents while 33.3% of the respondents reported that they were diagnosed at the hospital; 13.6% through friends, 5.8 % by self-diagnosing . Majority of these respondents were diagnosed by their parents, based on their previous experiences with VC.

Out the 330 study respondents, 276(83.6%) were diagnosed last term . that is between September and December last year (2016) while 16.4% were diagnosed as the time of the interview thus between January and February this year (2017). Out of these respondents, 52.2% indicated that some of their friends have also been diagnosed of VC (Fig 2).

Fig 2 Diagnoses



4.2.2 Knowledge of the cause(s) of VC

The Knowledge of the cause(s) of VC was accessed based on questions about the perceived cause(s) of VC. The majority 443(98.4%) of the study respondents indicated that VC has a known cause(s).

Out of these (443) , 387(87.4%) indicated sugary foods while 37.7% indicated sexual intercourse; 27.5% indicated misuse of antibiotic, 4.7% indicated pregnancy, 25.5 % indicated diabetes, 11.3% indicated weak immunity, and 17.2% indicated hormonal imbalances. 1.6% indicated stress, 1.8% indicated lack of sleep, 25.96 % indicated perfume soap, 15.4% indicated shower gel, 31.8 % indicated Vagina deodorant, 29.6% indicated Irritation of the vagina area by clothing, 6.6% indicated herbal preparation and 19.0% indicated douching .

Table 4.2: knowledge of the cause(s) of VC

Causes	Yes response	
	Frequency N= 443	**Percentage %**
Poor eating habits including a lot of sugary foods	**387**	**87.4**
Sexual intercourse	**167**	**37.7**
Irritation of the vagina area by clothing	**131**	**29.6**
Misuse of antibiotics	**122**	**27.5**
Perfumed soap	**115**	**26.0**
Uncontrolled diabetes	**113**	**25.5**
douching	**84**	**19.0**
Hormonal imbalances near your menstrual cycle	**76**	**17.2**
Shower gel	**68**	**15.4**
Weak immune system	**50**	**11.3**
Herbal preparation	**29**	**6.6**
pregnancy	**21**	**4.7**
Lack of sleep	**8**	**1.8**
Stress	**7**	**1.6**

Date are presented in frequency (N) and proportion (%) *Respondents indicated more than one source of information about CV

4.2.3 Knowledge of signs and symptoms

Out of the 450 respondents, 99.1% indicated that VC presents with sign and symptoms. The majority,391 (87.7%) of the respondents affirmed that itching of the vagina is one of the symptoms of VC while 79.6% affirmed large or small amount of whitish gray and thick vaginal discharge; 28.03% affirmed burning sensation, 49.3% affirmed soreness, 79.0% affirmed offensive odour, 28.0% affirmed burning sensation

Table 4.3 Knowledge of Signs and Symptoms of VC

Signs and Symptoms	Yes Response	
	Frequency N=446	**Percentage %**
Itching of vagina	**391**	**87.7**
Large or small amount of whitish-gray and thick vaginal discharge	**355**	**79.6**
Offensive odour(smell)	**352**	**78.9**
Soreness of the vagina (rashes around vagina)	**220**	**49.3**
Burning sensation in the vagina	**125**	**28.0**

Date are presented in frequency (N) and proportion (%) * Respondents indicated more than one source of information about CV

4.2.4 Perception of risk of acquiring and treatment of VC

Perceptions about VC were examined based on perceived self –susceptibility to risk and treatment VC. 81.96% of the respondents indicated that VC could be acquired through sharing of toilet facility while 5.12 % of the respondents had no idea and 12.92% of respondents indicated VC could not be acquired through sharing of toilet facility.

19.33% of the respondents indicated that the method of treatment is painful and that prevent affected persons from timely medical attention.

Table 4.4: Perceptions on Risk of Acquiring and Treatment of VC. N=450

Statement on perception	Yes N (%)	No N (%)	Don't know N (%)
Do you think vaginal candidiasis can be acquired through sharing of toilet facility	**368.**(82.0)	**58** (12.9)	**23** (5.1)
Is vagina candidiasis sexually transmitted	**187** (41.6)	**149** (33.1)	**114**(25.3)
All females are at risk of developing VC	**370** (88.2)	**29** (6.4)	**51.**(11.3)
The method of treatment is painful, and this is what prevents affected persons from seeking timely medical attention	**87** (19.33)	**272** (60.4)	**91** (20.2)
Herbal preparation can be used to treat VC.	**270** (60.)	**56** (12.4)	**124.**(27.6)
Women who had the previous history of VC are more likely to have it again.	**229** (50.9)	**78** (17.3)	**143.**(31.8)
Can VC be treated	**425** (94.4)	**5 (**1.1)	**20.**(4.4)
VC is infectious	**338** (75.1)	**60.**(13.3)	**52.**(11.6)

Date are presented in frequency (N) and proportion (%)

4.2.5 Awareness of Myths about VC

Only 10.00% of the respondents indicated that once diagnosed you are doom to have VC the rest of your life. 5.78% of the respondents believed that VC was as result of a curse. 1.56 % of the respondents indicated that VC was taboo. 46.89% indicated that eating a lot of fruits and vegetables can prevent VC

Table 4.5 Awareness of Myths about VC

Statements on Myths	Yes N (%)	No N (%)	Don't know N (%)
Are you doomed to have VC for the rest of your life once diagnosed	**45.**(10.0)	**286.**(63.5)	199.**(26.4)**
Is VC a result of a curse	**26** (5.7)	**377** (83.8)	47.**(10.4)**
Is VC a taboo	**7.**(1.6)	**401** (89.1)	42.**(9.3)**
Fruits and vegetables can be prevented VC	**211.**(46.9)	**109** (24.2)	130**(28.9)**
Every woman naturally has VC	**280.**(62.2)	**104.**(23.1)	66 **(14.7)**

Practice of douching

On douching, 51.33%(231) of the respondents practice douching, and 16.44% indicated douching could be used to treat VC while.59.56% indicated otherwise and 24.00% had no idea.(table 4.4)

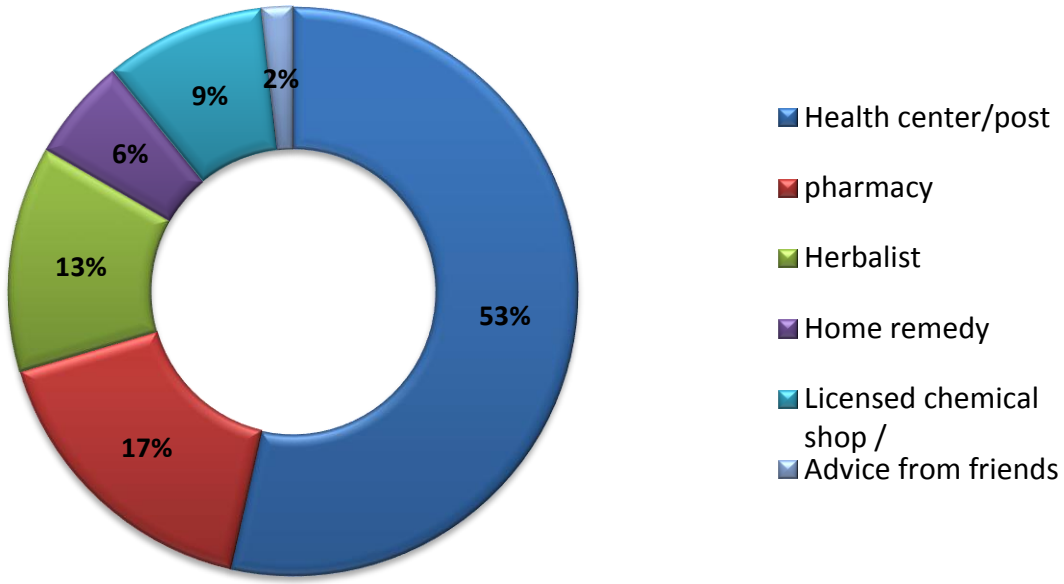
Table 4.6: Practice of Douching

Douching	Yes N (%)	No N (%)	Don't know N (%)
Do you practice douching	**231.(51.3)**	**219.(48.7)**	**0.(0.0)**
Do you think douching can be used to treat vc	**74.(16.4)**	**268.(59.6)**	**108.(24.0)**

Attitude and Health Seeking Behavior of Respondents

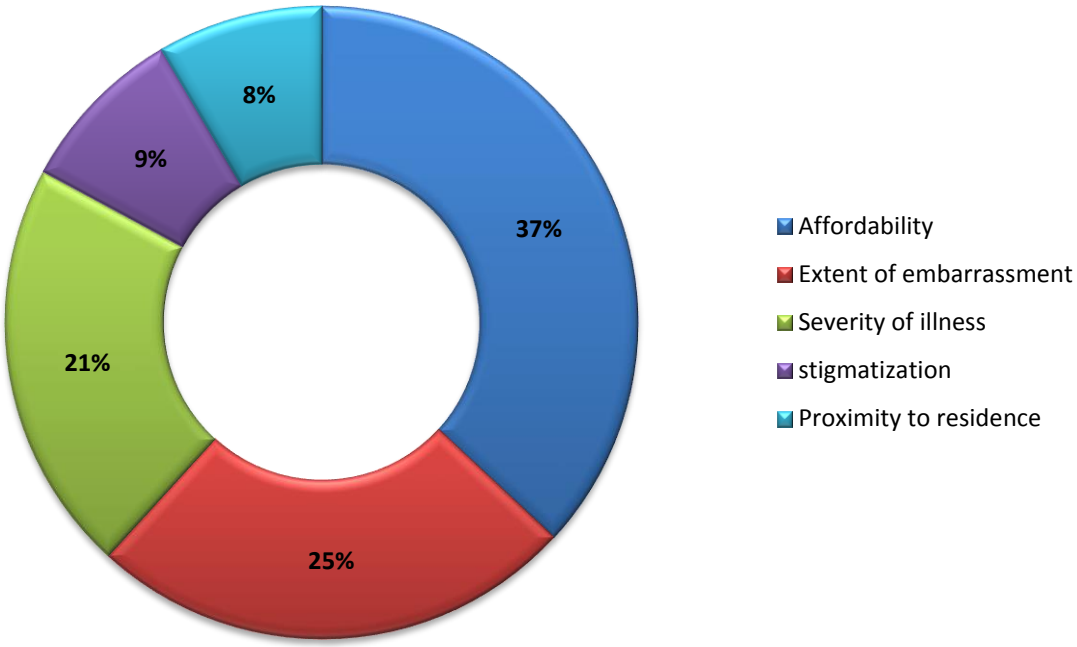
On where study respondents will go first if they suspect VC 53.56 % indicated they would go to health center/post first, 16.89% indicated pharmacy; 9.11% indicated drug store, 12.89% indicated herbalist, 5.78% indicated home remedy and 1.78 % indicated advice from friends.

Fig 3: Where Respondents go first when they see Signs and Symptoms



On the factors that influence the choice of seeking treatment 36.89% of the respondents indicated affordability while 24.89% indicated the extent of embarrassment; 8.44% indicated proximity to the residence, 21.11%indicated severity of the illness 8.67% indicated stigmatization.

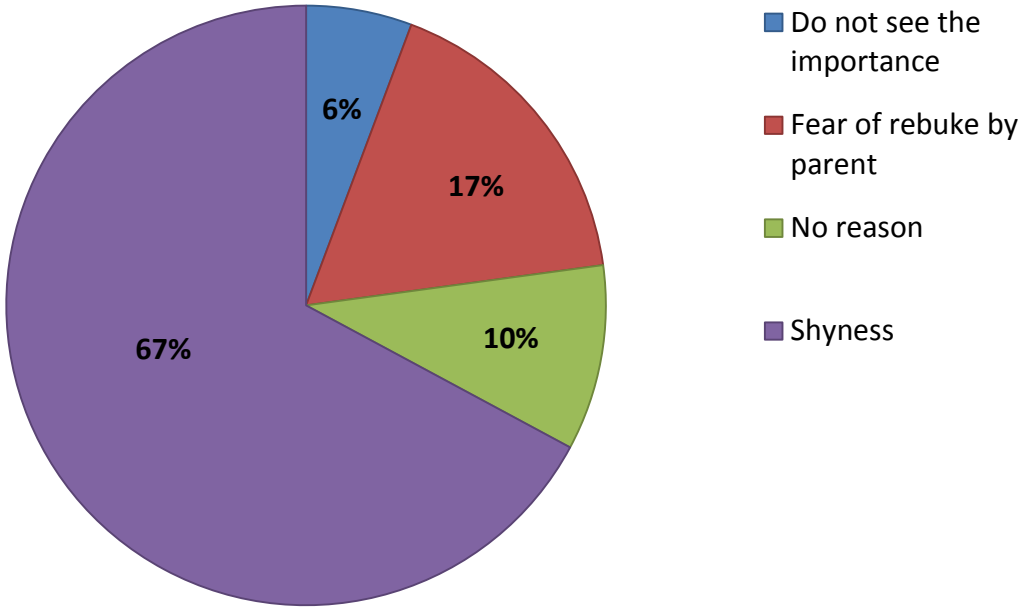
Fig 4: Factors influenced Respondent's choice above



Out of the 450 study respondents, 84.44 % indicated that they would inform their parent if they suspect they have VC while 13.78% indicated otherwise and 1.78 indicated they don't know if they would inform their parents.

The study respondents 62 (13.78%) who indicated they would not inform their parents and 8 (1.78) who don't know what to do, 5.71% indicated they do not see the importance,17.14% indicated fear of rebuke by parents 10.00% indicated no reason and 67.14% indicated shyness.

Fig 5 Respondent who will not inform their Parents



Association between practice of douching and demographic characteristics of respondents

The Bivariate analysis of the demographic characteristics of respondents and the practicing of douching revealed that Age (p=0.87), Religion (p=0.83), Place of residence (p=0.96), and who respondents live with (p=0.90) and status at school (0.41) was not significantly associated with the practicing of douching.However, there was a significant association between the form (academic level) of the respondents (p=0.02) and practice of douching. Similarly there also a correlation between the school (type) attended by the respondents (p=0.001) and practicing of douching (Table)

Table 4.6: Association between practice of douching and demographic Characteristics of respondents

	Yes N (%)	No N (%)	P-value
Age			
Below 16	**128 (51.0)**	**123 (49.0)**	**0.87**
Above 16	**103 (51.0)**	**96 (48.2)**	
Religion			
Christianity	**225 (51.3)**	**214 (48.8)**	
Islam	**6 (54.6)**	**5 (45.5)**	**0.83**
Place of residence			
Within municipal	**67 (51.4)**	**64 (48.9)**	
Outside municipal	**67 (51.2)**	**155 (48.6)**	**0.96**
Respondent living with:			
Both parents	**125 (49.6)**	**127 (50.4)**	
Mother	**59 (49.2)**	**61 (50.8)**	**0.90**
Father	**12 (46.2)**	**14 (53.9)**	
others	**23 (44.2)**	**29 (55.8)**	
Form			
Form 1	**101 (58.7)**	**71 (41.3)**	**0.02**
Form 2	**86 (49.4)**	**88 (50.6)**	
Form 3	**44 (42.3)**	**60.(57.7)**	
School attending			
Krobo girls	**106 (50.7)**	**103 (49.3)**	**<0.01**
Manya Krobo	**47 (38.8)**	**74 (61.2)**	
Akrosec	**47 (61.4)**	**30 (39.0)**	
Others	**31 (72.1)**	**12 (27.9)**	
Status			
Day	**56 (54.9)**	**46 (45.1)**	**0.41**
Boarding	**175 (50.3)**	**173 (49.7)**	

N represents number of respondents, % represents proportion

Association between the perception that every woman naturally has candidiasis and demographic characteristics of female students

The Bivariate analysis of the demographic characteristics of respondents and the perception that, every woman naturally has candidiasis revealed, that there was no association between Age (p=0.12), Place of residence (p=0.29), who the respondents live with (0.17), School attended by respondents (0.09), religion (0.70), Status of respondents (0.49) and the perception that every woman naturally has candidiasis.

All the same, there was a significant association between the form (academic level) of the respondent and the perception that every woman naturally has candidiasis (0.03).

Table 4.7: Association between the perception that every woman naturally has candidiasis and Demographic characteristics of female students

	Yes N (%)	No N (%)	P –value
Age			
Below 16	**186 (74.1)**	**65 (25.9)**	**0.12**
Above 16	**160 (80.4)**	**39 (19.6)**	
Religion			
Christianity	**337 (76.8)**	**102 (23.2)**	**0.70**
Islam	**9 (81.8)**	**2 (18.2)**	
Place of residence			
Within municipal	**105 (80.2)**	**26 (25.00)**	**0.30**
Outside municipal	**241 (75.6)**	**78 (24.5)**	
Respondent living with:			
Both parents	**192 (76,2)**	**60 (23.8)**	
Mother	**87 (72.5)**	**33 (27.5)**	**0.17**
Father	**23 (88.5)**	**3 (11.5)**	
others	**44 (84.6)**	**8 (15.4)**	
Form			
Form 1	**121 (70.4)**	**51 (29.7)**	
Form 2	**141 (81.0)**	**33 (19.0)**	**0.03**
Form 3	**84 (80.8)**	**20 (19.2)**	
School attending			
Krobo girls	**152 (72.7)**	**57 (27.3)**	
Manya Krobo	**101 (83.5)**	**20 (16.5)**	
Akrosec	**57 (74.0)**	**20 (26.0)**	**0.09**
Others	**36 (83.7)**	**7 (16.3)**	
Status			
Day	**81 (79.4)**	**21 (20.6)**	**0.49**
Boarding	**265 (76.2)**	**83 (23.9)**	

N represents number of respondents, % represents proportion

Demographic Characteristic and practice of douching
(Result of multivariate analysis and using logistic regression)

The practice of douching among Form 3 students is 0.52 times less compared to form 1 students .similarly form 2 students is 0.69 times less likely compare to form 1 students.

Those who practice douching are 1.2 times more likely to get VC compared to those who do not practice douching (Table; 4.8)

Table 4.8 Demographic Characteristic and Practice of Douching
(Result of multivariate analysis and using logistic regression)

Variables	Odds Ratio /[95% Conf. Interval		P -value
School and douching			
Akrosec	1.0		
others	1.6	(0.73-3.73)	0.22
Krobo Girls	0.7	(0.38-1.12)	0.12
Manya SHS	0.4	(0.22- 0.74)	<0.01
Form and douching			
one			
two	1.0		
three	0.5	(0.31-0.85)	<0.01
	0.6	(0.45-1.05)	0.08

Demographic Characteristic and the myth that every woman naturally has (Result of multivariate analysis and using logistic regression)

The perception that every woman naturally has candidiasis among form 3's is 1.8 times more compared to form 1's .similarly the form 2 is 1.8 times more compare to form 1's

Myths among others(private schools) is 1.8 times more compared to Akrosec .similarly Krobo Girls SHS is 0.9 times less compare to Akrosec whiles Manya SHS is 1.8 times less compared Akrosec.

Table 4.9: Independent and the myth that every woman naturally has (Result of multivariate analysis and using logistic regression)

Variables	Odds Ratio / [95% Conf. Interval]		P -value
myths and form			
One	1.0		
Three	1.8	(0.98 -3.20)	0.06
Two	1.8	(1.08 -2.98)	0.02
Myths and school			
Akrosec	1.0		
Others	1.8	(0.69 -4.74)	0.22
Krobo Girls	0.93	(0.52 -1.69)	0.83
Macrosec	1.78	(0.87 -3.59)	0.11

Practice douching and those who had the disease

Those who practice douching are 1.2 times more likely to get VC compared to those who do not practice douching. (P=0.33)

Table 4.10: Practice douching and those who had the disease

VC and Practice douching	Odd Ratio	Confidence interval	P-Value
Yes	1.2	0.81-1.87	0.33

Chapter 5

5.0 DISCUSSIONS

Introduction

The study was undertaken to examine the perceptions and attitudes of female students towards VC while exploring the knowledge and sources of information about causes signs and symptoms, and to determine the prevalence of douching as well as to identify local beliefs and myths about VC.

Knowledge on VC

The study found high awareness of VC among the respondents. The results indicated almost all the respondents were aware of VC. The socio-demographic characteristics were found not to have influenced the awareness. These might have been because frequencies of some demographic variables such as age and education were skewed. For instance, regarding age all the respondents had attained the risk age, and for educational level, all the respondents were students in the senior high school which give them a certain level of education.

This finding was consistent with a study in Mid-America Adolescent Sexually Transmitted Disease Clinical Research Center in May by Barousse *et al.* (1999). In another study by Abruquah (2012) on prevalence and antifungal susceptibility of Candida species among females attending patients in Ghana (Kumasi) showed that 15-20 year age group had the highest frequency of Candida isolation from high vaginal swabs.

On accessing information on VC, the majority reported having heard about VC from health professionals. This might have been because most of the schools have a sick bay with health

personnel who responds to emergency cases. This is where some students go first on their health issues.

However, some information was accessed from television and radio newspaper, Health pamphlets books and journals, family and friends. These sources could be important sources of information in carrying out VC awareness campaigns. All the same according to Barousse *et al.* (2004), proper education of teenagers, adolescents, and young adults could be useful in the control of VC. Dissemination of information helps to improve people's knowledge about a disease and also increases the risk of perceptions. (Matthew *et al.*, 2011)

A study conducted at the University of Abuja Teaching Hospital, Gwagwalada in Nigeria, by Anthony *E et al.* (2015), revealed that the prevalence of VC among non-pregnant female was 14% in comparison with other studies, the relatively low prevalence of VC among female was attributed to adequate knowledge among others.

Most of the respondents have ever been diagnosed of VC. This is consistent with other studies. A study in Ghana on Incidence and Risk Factors of VC in Girl's Senior High School in Bolgatanga, the study revealed an incidence rate of 25.5% for VC amongst the girls.

According to Pfaller M.A et al. (1999), 75% of all females will suffer from VC at least once in their lifetime. Virtually 40% to 50% will also experience multiple infections.

The majority of respondents were diagnosed with parents based on their previous experiences with VC. This finding is consistent with that of CDC (2014). According to CDC because of availability of Over-the-counter treatments for VC, More women are diagnosing and treating themselves. But VC has similar symptoms just as other genital infections. It will, therefore, be

difficult to diagnose a yeast infection by physical examination only. Diagnosis can be made by taking a sample of the vaginal secretions and looking at the sample under a microscope to see if an abnormal number of *Candida* organisms are present. A fungal culture may not always be useful because *Candida* species are normal inhabitants of the body. (CDC, on Genital and vulvovaginal, 2014). Information on the prevalence of VC does not always reflect the real situation regarding this disease since the frequency of patient's self-treatment remains high (Farage, et al. 2005)

Knowledge of the cause(s) of VC.

The overall the perceived knowledge on causes of VC was low among the study participants. Most of the respondents indicated poor eating habiting including a lot of sugary food, as the main cause of VC. Douching, use shower gel, vagina perfumes, weak immune system among others was perceived low. This perceived knowledge was consistent with a study by Samaranayake and MacFarlane from Scotland in 1987 which showed that dietary carbohydrates had an effect on adherence of Candida cells to epithelial cells which line all tissues and organs. According to them, candida grows in the presence of certain carbohydrates, ability to adhere to the epithelial cells significantly increases. Implying that, eating sugary and starchy stuff makes a female, more susceptible to VC infections.

According to Rylander, E *et al.* (2004), individual difference in practices such as sexual activity appears to be associated with the infection. Maikenti *et al. (2015),* work on The Prevalence of VC Colonization among Female Students in Bingham University Nasarawa state Nigeria showed that Soap which is alkaline could change the normally acidic environment of the vagina, and therefore

can damage mucous membranes. According to their work, the use of perfumes and dyes can also trigger an allergic reaction that leads to vaginal yeast infection.

Results from a prospective study of 250 pregnant women also concluded that extensive antibiotic use posed a risk for the development of yeast infection (Glover DD, Larsen B.1998) all the same a Spanish researcher Relloso and others published data in 2012 in which they found out that an increase in estrogen during ovulation and period impairs the immune response against Candida. Implying that estrogen helps Candida growth in environments that would otherwise have been bad for it

A 2009 Indian study by Ahmad and Khan found out that women with poor genital hygiene had more risk of getting VC infection as compared to women with good genital hygiene.

Knowledge of the sign and symptom

However, respondents correctly identified the signs and symptoms of VC. The knowledge level was very high. The majority of the respondents indicated itching of the vagina and other symptoms included the large or small amount of whitish gray and thick vaginal discharge, offensive odor, soreness, and burning of sensation in the vagina.

This finding was consistence with a Case Study by Eunice *et al.* (2014) on the Incidence and Risk Factors of VC in a Girl's Senior High School in Bolgatanga, Ghana The study revealed that vaginal itching is the most common symptom among participants who tested positive for Candida, followed by burning sensation, vaginal discharge , and irritation .

The finding is also consistent with that of Grigorious et al., (2006) which also reported pruritus or itching as the most common symptom followed by vaginal discharge. Ahmad and Khan (2009) in

India also reported in their work that the most common signs and symptoms in 215 females with VC infection were pruritus/ itching.

Practice of douching

Unfortunately, only a few of the respondents indicated douching as one of the main causes of VC But more than half of the respondents practice douching, few of the respondents believed douching could be used as a means of treatment for VC.

This finding is consistent with a study in the United States, where there have been reports of 52-69 percent of adolescents douching at least once and one study documenting 56 percent reporting douching one or more times (Chacko MR, McGill L, Johnson TC, et al. 1989) La Ruche G, *et al.(1999)* found in their work that douching is prevalent in some African countries, such as Côte d'Ivoire, where the douching rate among females has been reported to exceed 97 percent

According to Dr. James Clayman (2013), a Medical Superintendent and Obstetrician Gynecologist, Douching upsets the natural balance of bacteria in the vagina. These changes make the environment more favorable for the growth of bacteria or fungi that cause infections.

The Bivariate analysis showed an association between the practice of douching and some demographic characteristics. There was a significant association between the forms (education level) of the respondents and the practice of douching. The practice of douching among Form 3 students is 0.52 times less likely compared to form 1 students .similarly form 2 students is 0.69 times less likely compare to form 1 students. This indicates that as the level of education increases the practicing of douching decreases among the respondents.

Research by Temel et al. (2007), drew attention to the fact that most females who perform vaginal douching are primary school graduates and there is a significant relationship between education level and this habit.

Similarly, there was also an association between the school attended by the respondents and practicing of douching. The practice of douching among others(private schools) is 1.6 times more likely compared the other school which were much lower this also indicated that the act of douching was practice more in the private schools than the government schools

Perceptions on VC

Perception of risk of acquiring and treatment of VC

The most of the respondents indicated that VC could be acquired through the sharing of toilet facility. However, majority had a good perception that as females one is likely to get VC.

This finding is consistent with a study in Auchi community of Edo State, Nigeria by Ibhafidon-Momodu (2016) This study focused on the incidence of Candidiasis infection among females as it relates to shared toilets facilities in educational institutions and domestic facilities in Auchi community of Edo State, Results revealed that Candida Albicans were present in some shared sanitation toilets of both educational and domestic facilities.

.

Local belief and myths

The majority of the respondents believe that every woman naturally has candidiasis while almost half of the respondents also believed that eating fruits and vegetable can prevent VC.

Only a few respondents believed that VC. Once diagnosed one is doom to have it the rest of her life

This Finding is not consistent with the findings of Pfaller M.A et al. (1999) who found out in their work that globally 75% of all females will suffer from VC at least once in their lifetime and not all women. Secondly, 40% to 50% will also experience multiple infections and not doom to have it the rest of their lives. According to Reed B. (1992) adherence to strict diets has not been beneficial.

However, there was a significant association between the perception that every woman naturally has candidiasis and some demographic characteristics of female respondents. **A** Bivariate analysis of the demographic characteristics, form (representing the education level of respondents) and the perception that, every woman naturally has candidiasis revealed.

The perception that every woman naturally has candidiasis among form 3's is 1.8 times more likely compared to form 1's .similarly form 2 is 1.8 times more likely compare to form 1's

Myths among others(private schools) is 1.8 times more likely compared to Akrosec .similarly Krobo Girls SHS is 0.9 times less likely compare to Akrosec whiles Manya SHS is 1.8 times less likely compared Akrosec.This indicates that the level of educations and type of school (private or government).

Attitude and health seeking behavior of respondents

Health seeking behavior

The majority of the respondents indicated that they would go to the health center /post. This May be because most of the schools have infirmary (emergency centers)

Majority said they would make a choice base on affordability other also few indicated the extent of embarrassment place the two above on the severity of the illness

Attitude

The majority of the respondents indicated that would inform their parents if they have the VC. This might also explain why most of the respondents were diagnosed by their parents. Only a few indicated they do not have to see the importance.

Chapter 6

6.0 CONCLUSIONS AND RECOMMENDATIONS

This study has revealed high awareness about VC. But the level of knowledge on the causes of the VC was low although they were more knowledgeable about the signs and symptoms of VC.

The respondents accessed information on VC mainly from health professionals. Other sources of information mentioned included from school, health pamphlets, and newspapers among others.

Perceptions held about VC were moderate. However, perceived self-susceptibility of risk to VC was also low among the study group.

The practice of douching was very high, and there was an association between forms and schools of the respondents

Vaginal candidiasis and the practice of douching were very high in the private schools compared to government schools

Almost half of respondents do not report to the hospital when they get VC.

Recommendation

Female students in the Municipality should be encouraged through health education and programs to build upon their positive attitudes and willingness to report to a health facility for early diagnosis and better treatment.

More attention should be given to female genital infections at all level of education.

Policy

School Health Education Programs (SHEP) and The Ministry of Health (MOH) Must work together to organize periodic educational campaigns for females at all age groups in Municipality to educate on genital infections. As the level of education and age collated with knowledge on VC.

Future Research

This is a quantitative study and was limited in exploring barriers and challenges that influence VC. Future research in this area in the municipality should employ mixed method (both quantitative and qualitative techniques) to explore further, perceptions and attitudes about VC

REFERENCE

Abruquah, H. H. (2012). Prevalence and antifungal susceptibility of *Candida* species isolated from women attending a gynaecological clinic in kumasi, Ghana. Journal of science and technology. 32 (2): 39-45.

Ahmad, A. &Khan, A. U. (2009). Prevalence of *Candida* species and potential risk factors for vulvovaginal candidiasis in Aligarh, India. European Journal of Obstetrics & Gynaecology and Reproductive Biology. 144 (1): 68–71.

Asticcioli, S., Sacco, L., Daturi, R., Matti, C., Nucleo, E., Zara, F. and Pagani, L. (2009). "Trends in frequency and in vitro antifungal susceptibility patterns of *Candida* isolates from women attending the STD outpatients clinic of a tertiary care hospital in Northern Italy during the years 2002-2007." *New. Microbiol., 32(2): 199-204.*

Bang, R. and Bang, A. (1994) Women's perceptions of white vaginal discharge: ethnographic data from rural Maharashtra. In Gittelsohn, J., Bentley, M., Pelto, P., Nag, M., Pachauri, S., Harrison, A. and Landman, L. (eds), *Listening to Women Talk about their Health: Issues and Evidence from India*. Har-Anand Publications, New Delhi, pp. 79–94.

Barrousse, M. M.,Van Der Pol &B. J., Fortenburry, D. (2004).Vaginal yeast colonisation, prevalence of vaginitis, and associated local immunity in adolescent. Sexually Transmitted Infections. 80(1): 48-53.

Berge, A. O., Heidrich, F.E., and Fihn, S.D. (1984). Establishing the cause of genitourinary symptoms in women in a family practice. Comparison of clinical examination and comprehensive microbiology. The Journal of the American Medical Association. 251: 620-625.

Bohannon, N. J. (1998). Treatment of vulvovaginal candidiasis in patients with diabetes. Diabetes Care. 1998;21:451–6.)

CDC (2013). Guidelines for treatment of sexually transmitted diseases.Morb. Mortal. Wkly. Rep., 47(1): 1-111.

Dolzenko, I.S. (2006). On the estimation of reproductive health of girls according to routine inspections. Reproductive Health of Children and Adolescent, 301(3), 68.

Enwuru, C.A., Ogunledun, A., Idika, N. (2008). Fluconazole resistant opportunistic oro-pharyngeal Candida and non Candida yeast-like isolates from HIV infected patients attending ARV clinics in Lagos, Nigeria. African Journal of Health Sciences. 8: 142-148.

Farage, M.A., & Stadler, A. (2005). Risk factors for recurrent vulvovaginal candidiasis. American Journals Obstetrics Gynecology, 192(3), 981982.,http://dx.doi.org/10.1016/j.ajog.2004.08.020, PMid:15746702.

Feglo, K. &Narkwa, P. (2012). Prevalence and Antifungal Susceptibility Patterns of Yeast Isolates at the Komfo Anokye Teaching Hospital (KATH), Kumasi, Ghana. British Microbiology Research Journal. 2(1): 10-22.

Foxman, B. (1990). The epidemiology of vulvovaginal candidiasis. The risk factors. American Journal of Public Health. 80: 329-331.

Geiger, A. M., &Foxman, B. (1995).The epidemiology of Vulvovaginal candidiasis among university students. American Journal of Public Health. 85(8): 1146-1148.

Georgiev V. (2003). Opportunistic Infections: Treatment and Prophylaxis. Humana Press 2003:239. [PubMed] 5. D. M. MacCallum, "Hosting infection: experimental models to assay Candida virulence," International Journal of Microbiology, vol. 2012, Article ID 363764, 12 pages, 2012. View at Publisher · View at Google Scholar · View at Scopus

Grigirious, O., Baka, S., Makrakis, E. (2006). Prevalence of clinical vaginal candidiasis in a university hospital and possible risk factors. European Journal of Obstetrics & Gynecology and Reproductive Biology. 126 (1): 121–125.

Nelleke, H. (2008). Project share Ghana.org. November 3, 2008.

NHS (2013). Choices, United Kingdom National Health Service -Preventing vaginal thrush, reviewed 2012-02-17, retrieved June 10, 2013) Dr. Ronald Sowa Ghana) ((Reed B. Risk factors for Candida vulvovaginitis.

Obstet Gynecol Surv(1985). The Truth Behind Common Beliefs About Yeast Infections By chris iliades md 7/31/2014) 47:551–6)

O'Connor, M. I., Sobel, J. D. (1986). Epidemiology of recurrent vulvovaginal candidiasis: identification and strain differentiation of Candida albicans. J Infect Dis. 1986;154:358–63.

Oyelese, A. O., Onipede, A. O., Aboderin, A. O., Adedosu, A. N., &Onayemi, O. (2005). Sexually transmitted infections in Obafemi AwolowoUniversity Teaching Hospital Ile-Ife, Nigeria: a decade of clinicexperience. Afr. J. Clin. Exp. Microbiol., 6(1): 64-68.

Pappas, P. G., (2016). A prospective observational study ofcandidemia: epidemiology, therapy, and influences on mortality inhospitalized adult and pediatric patients. Clin Infect Dis 2003; 37:634–643.

Pfaller, M. A., Messer, S. A., Hollis, R. J., Jones, R. N., Doerm, G. V., Brandt, M. E. and Hajjeh, R. A. (1999). "Trends in species distribution and susceptibility to fluconazole among blood stream isolates of *Candida* species in the United States." *Diagn. Microbiol. Infect. Dis., 33(4): 217-222*.

Reed, B. D. (1992). Risk factors of Candida vulvovaginitis. Obstetrical and Gynecological Survey. 47: 551-560.

Reed, B. D., Slattery, M.L.,&French, T.K. (1989). The association between dietary intake and reported history of Candida vulvovaginitis. Journal of Family Practice. 29: 509-515.

Starkey, F. (1998) Maternity and health links: an advocacy service for Asian women and their families. In Doyal, L. (ed.), *Women and Health Services. An Agenda for Change.* Philadelphia, Buckingham, pp. 127–140.

Segal, E. (2004). Candida, still number one – what do we know and where are we going from there? Mycoses 48: 3-11.

Sobel, J. D. (1993). Vaginal infections in adult women. Sex Transm. Dis.,74: 1573-1601.

Spinillo, A, Capuzzo, E, Acciano, S., Santolo, R. & Leegaard, Y. (1984). Effect of antibiotic use on the prevalence of symptomatic vulvovaginal candidiasis. American Journal of Obstetrics and Gynecology. 180:14–7.

Sydnor, Emily, (24 January 2011). "Hospital Epidemiology and Infection Control in Acute-Care Settings". Clinical Microbiology Reviews (1) (24): 141–173. doi:10.1128/CMR.00027-10. PMC 3021207. PMID 3021207

Williams, B. G., Knight, S. S., King, Q. A., & Harris, E. (1975). Epidemiological impactof tenofovir gel on the HIV epidemic in South Africa. J Acquir ImmuneDefic Syndr, in press.

World Health Organization (WHO) (2016). Global prevalence andincidence of selected curable sexually transmitted infections.WHO/HIV-AIDS/2001.02 WHO/CDS/CSR/EDC/2001.10.

Yehuda, Z., Burnstein, S., Derazne Estella; Sandler Vadim; Ianculovici Clariel; Halperin Tamar (March, 2010). "Colonization of Candida: prevalence among tongue-pierced and non-pierced immunocompetent adults". Oral Dis 16 (2): 172–5.)

APPENDIX

1.1 APPENDEX 1 Questionnaire

This questionnaire aims at examining the perception, belief and attitudes towards vaginal candidiasis among female students in five Senior High Schools in the Asuogyman district in the Eastern Region of Ghana. The questionnaire collects information about socio-demographics, perceptions, knowledge and attitudes toward vaginal candidiasis. Your participation is kindly needed for the study. Thank you.

Section A: Socio-demographic characteristics (Please tick the one appropriate)

NO	QUESTIONS	RESPONSE	CODE
Q1	How old are you?----------yrs		
Q2	Where do you live?(Asuogyman district)	Within the district ☐ Outside the district ☐	1 2
Q3	Who do you mostly live with during vacation?	Mother ☐ Father ☐ both Mother and father ☐ Others ----------	1 2 3
Q4	What is your religious affiliation?	Christian ☐ Moslem ☐ Traditional ☐ Others ☐	1 2 3 4

Q5	What is the name of your school?	Akwamuman SHS ☐ Anum SHS ☐ Adjena SHS ☐ Apegusu SHS ☐ Boso SHS ☐	1 2 3 4 5
Q5	Which form are you?	Form one ☐ Form two ☐ Form three ☐	1 2 3
Q6	Are you a boarder or day student	Boarder ☐ Day ☐	1 2

Section B: Sources of information and knowledge about vaginal candidiasis

Q7	Have you ever heard of vaginal candidiasis?	Yes ☐ No ☐	1 2
Q9	If yes, what is your source of information about vaginal candidiasis?	TV ☐ Radio ☐ News paper ☐ Health pamphlet ☐	1 2 3 4

		Church/Mosque ☐ Internet ☐ Books and Journals ☐ Health Professionals ☐ Family and friends ☐ School ☐	5 6 7 8 9 10
Q10	Have you ever been diagnosed of vaginal candidiasis?	Yes ☐ No ☐	1 2
Q11	Have any of your family and friends been diagnosed of vagina candidiasis?	Yes ☐ No ☐	1 2

The following questions examine your knowledge **vaginal candidiasis**

Q12	What are two popular names students call vaginal candidiasis	1---------- 2----------	

Q13	Does Vagina candidiasis have a known cause(s)	Yes ☐ No ☐	1 2
Q14	If yes, which of these do you think may be the cause(s) of vagina candidiasis(choose as much as you know)	Misuse of antibiotics ☐ Pregnancy ☐ Uncontrolled diabetes ☐ Weak immune system ☐ Poor eating habits, including a lot of sugary foods. ☐ Hormonal imbalance near your menstrual cycle ☐ Stress ☐ Lack of sleep ☐ Perfumed soap ☐	1 2 3 4 5 6 7 8 9

		Shower gels ☐ Vaginal deodorant ☐ Irritation of the vaginal area by clothing ☐ Herbal preparations ☐ ☐ Sexual intercourse Douching ☐ Others……	10 11 12 13 14 15
Q15	Does vaginal candidiasis presents with signs and symptoms?	Yes ☐ No ☐	1 2

Q16	If yes, what are the signs and symptoms?	itching of vagina ☐ burning sensation in the vagina ☐ large or small amounts of whitish gray and thick vaginal discharge, ☐ soreness of the vagina ☐ rashes around vagina ☐ Offensive odour(smell) ☐ Others ……	1 2 3 4 5 6
Q17	All females are at risk of developing the vagina candidiasis	Yes ☐ No ☐ Don't agree ☐	1 2 3
Q18	Females who have a previous history of vagina candidiasis are likely to have recurrence	Yes ☐ No ☐ Don't know ☐	1 2 3

Q19	Vagina candidiasis can be treated	Yes ☐ No ☐ Don't know ☐	1 2 3

Section C: Information on perceptions about vaginal candidiasis (Please tick the one appropriate)

Q20	Every woman naturally has vagina candidiasis	Yes ☐ No ☐ Don't know ☐	1 2 3
Q21	Do you think vagina candidiasis is infectious?	Yes ☐ No ☐ Don't know ☐	1 2 3
Q22	Do you think vaginal candidiasis can be acquired through sharing of toilet facility?	Yes ☐ No ☐ Don't know ☐	1 2 3

Q23	Is vaginal candidiasis sexually transmitted?	Yes ☐ No ☐ Don't know ☐	1 2 3
Q24	Do you think you are susceptible to vagina candidiasis?	Yes ☐ No ☐ Don't know ☐	1 2 3
Q25	Are you doomed to have vaginal candidiasis for the rest of your life once diagnosed?	Yes ☐ No ☐ Don't know ☐	1 2 3
Q26	Is vagina candidiasis a result of a curse?	Yes ☐ No ☐ Don't know ☐	1 2 3
Q27	Is vagina candidiasis a taboo?	Yes ☐ No ☐ Don't know ☐	1 2 3
Q28	Do you think painful treatment deters affected persons from seeking timely medical attention?	Yes ☐ No ☐ Don't know ☐	1 2 3
Q29	What is your opinion on the cost of treatment at the hospital?	Affordable ☐ Non- Affordable ☐	1 2

Q30	Do you believe that eating too much sugar can cause vagina candidiasis	Yes ☐ No ☐ Don't know ☐	1 2 3
Q31	Do you believe that eating a lot of fruits and vegetables can prevent vagina candidiasis	Yes ☐ No ☐ Don't know ☐	1 2 3
Q32	Out of ten(10) students how many do think practice douching (**Douching is the practice of washing or flushing the vagina with water , other fluids or soap**)	…….	
Q33	Do you think douching can be used to treat candidiasis	Yes ☐ No ☐ Don't know ☐	1 2 3
Q34	Herbal preparation can be used to treat candidiasis	Yes ☐ No ☐ Don't know ☐	1 2 3

Information on attitudes toward

Q35	Where will you go first when you experience any signs or symptoms of vagina candidiasis? (One option only)	Licensed chemical shop/drug store ☐ Pharmacy ☐ Health center/post ☐ Hospital ☐ Herbalist ☐ Prayer camp ☐ Shrine ☐ Advice from friends ☐ Home remedy ☐	1 2 3 4 5 6 7 8 9
Q36	Which main factors influence your choice above? (one option only)	Affordability ☐ Proximity to residence ☐ Severity of illness ☐ Extent of embarrassment ☐	1 2 3 4

		Stigmatization ☐	5
Q37	Will you tell your parent if you have vagina candidiasis?	Yes ☐ No ☐ Don't know ☐	1 2 3
Q38	Will you tell your parent if you have vagina candidiasis?	Yes ☐ No ☐ Don't know ☐	1 2 3
Q39	If no why	Fear of rebuke by parent ☐ Shyness ☐ Stigmatization ☐ Do not see the importance ☐ No reason ☐	1 2 3 4 5

1.2 APPENDIX: Consent Forms

STUDY TITLE: perception and attitudes towards vaginal candidiasis infection, a survey among female students in selected senior high schools in the Lower Manya Krobo Municipal in the eastern region of Ghana

Participant information sheet & consent form

PART 1 PARTICIPANT INFORMATION

INTRODUCTION

I am from Ensign College of Public Health in Kpone. I am conducting a study that involves research on the perception and attitude towards vaginal Candidiasis infection among female students in some selected senior high schools in the Asuogyaman district in the Eastern Region of Ghana. I will be explaining all about the study to you, and you will also receive a copy of the leaflet that explains all about this research study that you are being asked to join in. Please take all the time you need to read it carefully. You may ask me any questions about anything you do not understand at any time. You are a volunteer. You can choose not to take part and if you join, you may quit at any time. There will be no penalty if you decide to quit the study.

Why you are being asked to participate

You have being asked to take part in this study because your school is among the selected Senior High Schools in the Asuogyaman District in the Eastern Region of Ghana. Specifically, I am interested in taking information from young female students between ages: 14 to 25 years old, in schools, and in all I plan to ask such people to participate in the study.

Procedures

If you agree to be part of the study, a trained project staff, will ask you to fill a questionnaire alone for approximately 10 - 30 minutes. As a participant, if you agree to participate in this study, data from your responses may be used as part of my assessment of the knowledge, perception and attitude towards vaginal candidiasis infection among female students in the Asuogyaman District in the Eastern Region of Ghana.

Risk and Benefits

I anticipate minimal or no risk to you. There is no direct benefit to you for being in the study; however, the study outcomes may lead to better understanding of the knowledge, perception and attitude towards vaginal candidiasis infection, among female students, which may help in health policy development and Programs planning (by SHEP) to improve on the health status of female students through provision of effective interventions to control candidiasis.

Confidentiality

All data will be de-identified and will be kept private. Your identifiable data such as name or date of birth will not be used in documents, reports, or publications related to this research. I will keep all documents secured and under locked.

When typing your survey responses into the computer, all data will be entered without any information that will make it possible for your identity to be known. The information you provide will be kept strictly confidential and will be available only to persons related to the study. (Myself and my supervisors) The Office of Ethical Review Board of Ensign College may also have access to study records upon their request.

Your responses will not be shown to other participants or community members. The original paper survey forms will be destroyed once data entry is complete.

Voluntariness and Withdrawal

Your participation in the study is completely voluntary and you reserve the right not to participate, even after you have taken part, to withdraw. This is your right and the decision you take will not be disclosed to anyone. It will not affect the care that will be offered to you at the health facility now or in future. If you join the study, you can change your mind later. You can choose not to take part and you can quit at any time. There will be no negative consequences if you choose not to participate in the study. Please note however, that some of the information that may have been obtained from you without identifiers, before you chose to withdraw, may be used in analysis reports and publications.

Cost/Compensation

Your participation in this study will not lead to you incurring any monetary cost during or after the study.

Who to contact

This study has been approved by the Institutional Review Board of Ensign College. If you have any concern about the conduct of this study, your welfare or your rights as a research participant or if you wish to ask questions, or need further explanations later, you may contact me Gerald Oduro (0248658497) of Ensign College of Public Health, or My supervisor Dr. Frank Baiden (0204591181) You may also contact the Administrator of the Institutional Ethics Committee of the Ensign College of Public Health at (+233245762229).

Thank you.

Do you have any questions?

Part 2. CONSENT DECLARATION

"I have read the information given above, or the information above has been read to me. I have been given a chance to ask questions concerning this study; questions have been answered to my satisfaction. I now voluntarily agree to participate in this study knowing that I have the right to withdraw at any time without affecting future health care services"

thumbprint of participant

Name of **participant** _____

Signature of **Participant** _____

Date: / / 2016

Name of **witness** _____

Signature of **witness** _____

Date: / / 2016

Name of **investigator** _____

Signature of **investigator** _____

Date: / / 2016

1.3 APPENDIX 3 Ethical approval