UNIVERSITY OF GHANA SCHOOL OF PUBLIC HEALTH
DEPARTMENT OF POPULATION, FAMILY AND REPRODUCTIVE HEALTH

TOPIC: USE OF VAGINAL CLEANSING PRODUCTS AND ITS RELATIONSHIP WITH ABNORMAL VAGINAL DISCHARGE AMONG WOMEN AT THE TEMA GENERAL HOSPITAL

THIS DISSERTATION IS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF PUBLIC HEALTH DEGREE

BY

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APRIL 2023

DECLARATION

I hereby declare that this dissertation is the product of my own research undertaken under the supervision of the undersigned lecturer and except for references to other people's work, this dissertation has neither been presented in whole nor in part for another degree elsewhere. I take responsibility for any errors in the work.

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Prof. Juliana Y. Enos

(Supervisor)

DEDICATION

I dedicate this work to God, my parents and siblings.

ACKNOWLEDGEMENTS

My utmost gratitude goes foremost to God Almighty for the gift of life and the strength and grace to undertake this postgraduate program and project work.

My immense appreciation also goes to Professor Juliana Y. Enos for her dedication, guidance, help and academic support granted me during the undertaking of this project.

My heartfelt gratitude also goes to my parents and siblings for their love, support, words of wisdom and encouragement during this academic pursuit.

I also thank my research assistant Daniel, for his work ethic, dedication, hardwork and coordination for ensuring that the data collection process went on smoothly.

My sincere gratitude also goes to Pharm. Benjamin Tagoe, for utmost support, dedication and guidance during my data collection and analysis.

I appreciate my friends, Dr Alex Ackon, Henrietta Baidoo, Doris Ocansey, Winifred Baidoe, Felix Okai and Dr Hubert Gbate for your emotional support and companionship.

The completion of this research would not have been possible without your participation. Your contributions in diverse ways are sincerely appreciated. God bless you all.

ABSTRACT

Background: The use of vaginal cleansing products is fast becoming part of the daily routine of women. Vaginal cleansing products come in diverse forms such as gels, intimate washes, and wipes among others. Most studies on vaginal cleansing products focus on douching but little attention has been given to the other vaginal cleansing products and their impact on the reproductive health and quality of life of the women who use them.

Objective: This study sought to determine the prevalence of vaginal cleansing product use among women at the Tema General Hospital and its relationship with abnormal vaginal discharge.

Methods: Using a semi-structured questionnaire, a hospital-based cross-sectional survey was carried out at the Tema General Hospital. Female patients aged 18 to 47 years were selected via convenience sampling from the OPD, OB/GYN and pharmacy department attendants. Data was analysed using STATA version 17.0. Descriptive statistics were carried out for all the socio-demographic characteristics of respondents. A chi-square test was used to assess the association between the use of vaginal cleansing products and abnormal vaginal discharge. The magnitude and strength of the association between vaginal cleansing products use and abnormal vaginal discharge as an outcome were determined while adjusting for other covariates using logistic regression analysis.

Results: The majority of respondents reported the use of VCPs (74%). The use of commercially manufactured products especially feminine washes was prevalent among those who used VCPs. All respondents had experienced abnormal vaginal discharge at least once in the past six months. A relationship between the use of VCPs and abnormal vaginal discharge was determined and participants who used VCPs had about four times higher odds of experiencing AVD compared to participants who did not use VCPs, OR=3.84 (2.42,610) 95% C.I. There was also a positive correlation between odour of vaginal discharge and knowledge on VCPs.

Conclusion: The use of vaginal cleansing products was found to be associated with abnormal vaginal discharge. The findings of this study demonstrated that the use vaginal cleansing products among participants was associated with AVD. Also, those who use VCPs, use it on a daily basis. Furthermore, females in the reproductive age bracket tend to use VCPs based on vaginal odour Healthcare providers must sensitise clients on VCPs and their intended purposes as well as vaginal care practices to enable women restore, promote and maintain their reproductive health and wellness.

Table of Contents

List of figures

List of tables

List of Abbreviations

AVD	Abnormal vaginal discharge
VVC	Vulvovaginal candidiasis
BV	Bacterial vaginosis
TV	Trichomoniasis
VCP	Vaginal cleansing products
WHO	World Health Organisation
OB/GYN	Obstetrics/Gynaecology
OPD	Outpatients Department
STI	Sexually Transmitted Infections

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

The vaginal cleansing products market is rapidly expanding as it gradually becomes the centre of the beauty and cosmetic industry (Ott et al., 2009). Vaginal cleansing products may come in the form of wipes, gels, intimate washes, and sprays among others. These products are fast becoming part of the daily cleansing routine of women. Vaginal cleansing refers to products designed to clean and care for the vulva and vagina. In the context of this study, this excludes sanitary pads, towels and tampons used during menstruation. The use of these vaginal cleansing products may be associated with various factors such as personal preference, cultural or societal norms among others (Chen et al., 2017). These products are frequently used by women of reproductive age (Crann et al., 2018) however, little is known about product usage.

Previous studies focused on vaginal health behaviours such as douching (Mitchell, 2004). A study conducted by Ziba *et al* in the Bolgatanga municipality of the Upper West region of Ghana determined the prevalence of douching to be over 60% among women. This practice is linked to adverse health outcomes such as ectopic pregnancy and pelvic inflammatory disease (Ziba et al., 2019). Research in United States of America have also demonstrated that women who douched also used vaginal cleansing products (Grimley et al., 2006). 'Cross-sectional studies in the US have reported that between 42% and 53% of women had used sprays and between 17 and 50% used feminine wipes (Crann et al., 2018).

In Ghana, various types of vaginal cleansing products are available on the market. Advertisements of such products have led to huge patronage. The purchase of such products is mostly linked to their indications on the labels. They include treatment of vaginal yeast infection, tightening of vaginal muscles, and restoring and maintaining vaginal pH. There may be other reasons associated with the use of these products.

Changes in colour, consistency, volume or odour may indicate abnormal vaginal discharge, which may also include symptoms such as pelvic pain, itchiness, soreness, dysuria or intermenstrual or post-coital haemorrhage (Sim et al., 2020). Abnormal vaginal discharge is caused generally by infection. About 70% of all causes are associated with bacterial vaginosis (BV), vulvovaginal candidiasis (VVC) or trichomoniasis (TV) (Paladine & Desai, 2018; Sim et al., 2020). Studies have shown a link between intravaginal practices and abnormal vaginal discharge (Attieh et al., 2016).

The vulvovaginal area encompasses the external parts of the female genitalia including the vaginal opening. Disruptions in the pH, microbiota or any other thing involved in the vulvovaginal physiology of the area can lead to adverse health effects such as VVC and BV, and impact on the quality of life of women (Felix et al., 2020).

1.2 PROBLEM STATEMENT

There is a myriad of vaginal cleansing products on the market with little information on their proper use. Vaginal cleansing products can be easily obtained from markets, supermarkets, pharmacies and other areas of commerce where they are sold. Inappropriate use of female intimate hygiene products and practices can be related to some vaginal infections such as vulvovaginitis (BV, VVC, TV) (Attieh et al., 2016).

In the United States alone, vaginal complaints lead to almost 10 million general care visits each year (Sim et al., 2020). Abnormal vaginal discharge is a common sign and symptom often associated with these vaginal infections. Although abnormal vaginal discharge is not a sign of Sexually Transmitted Infections (STIs), it may be linked to it as the use of female intimate hygiene products can mask it (Ott et al., 2009). Some studies have stated possible links of vaginal cleansing products and abnormal vaginal discharge (Fashemi et al., 2013) while other

studies stated that the use of these products may be good adjunctive therapy for odorous vaginal discharge (Chen et al., 2017).

Very few studies have been conducted in the area of vaginal hygiene practices globally. Vaginal douching, in particular, has received much attention (Ziba et al., 2019). However, there is paucity of data regarding the use of vaginal cleansing products in the world (Chen et al., 2017), and specifically the West African sub region, and their relationship with abnormal vaginal discharge. Anecdotally, many women in Ghana use VCPs, but its effect like AVD has not been empirically investigated. There is no available data on VCP use in Ghana. Thus, this study seeks to investigate the use of vaginal cleansing products and their relationship with abnormal vaginal discharge among women attending the Tema General Hospital in the Greater Accra Region of Ghana.

1.3 JUSTIFICATION

Vaginal cleansing products may disrupt the vagina's normal pH level of 4.5, which is critical for maintaining a healthy vaginal barrier environment. Such products and practices may disrupt the natural vaginal microbiome composition, which is necessary for a healthy mucosal environment and protection against yeast infection or other sexually transmitted pathogens (Fashemi et al., 2013). The vagina is self-cleansing with its own normal flora. The vaginal microbiome has an integral role in a woman's reproductive health including fertility and quality of life (Kong et al., 2020). Some of these products marketed as cleansing products have been reported to have potential adverse health effects (Jenkins et al., 2021). Hence, the potential relationship between the use of vaginal cleansing products and abnormal vaginal discharge, which is indicative of STIs needs to be investigated, as the global burden of reproductive tract infections increase.

1.4 RESEARCH QUESTIONS

1. What is the prevalence of vaginal cleansing products among women of reproductive age (18-47 years) attending the Tema General Hospital?

2. What are the types of vaginal cleansing products used among women aged 18-47 years?

3. What is the frequency of use of vaginal cleansing products among women aged 18-47 years attending the Tema General Hospital?

4. What is the relationship between vaginal cleansing products use and abnormal vaginal discharge?

5. What is the level of knowledge about vaginal cleansing products, abnormal vaginal discharge and the relationship between the two, if any?

1.5 OBJECTIVES

1.5.1 GENERAL OBJECTIVE

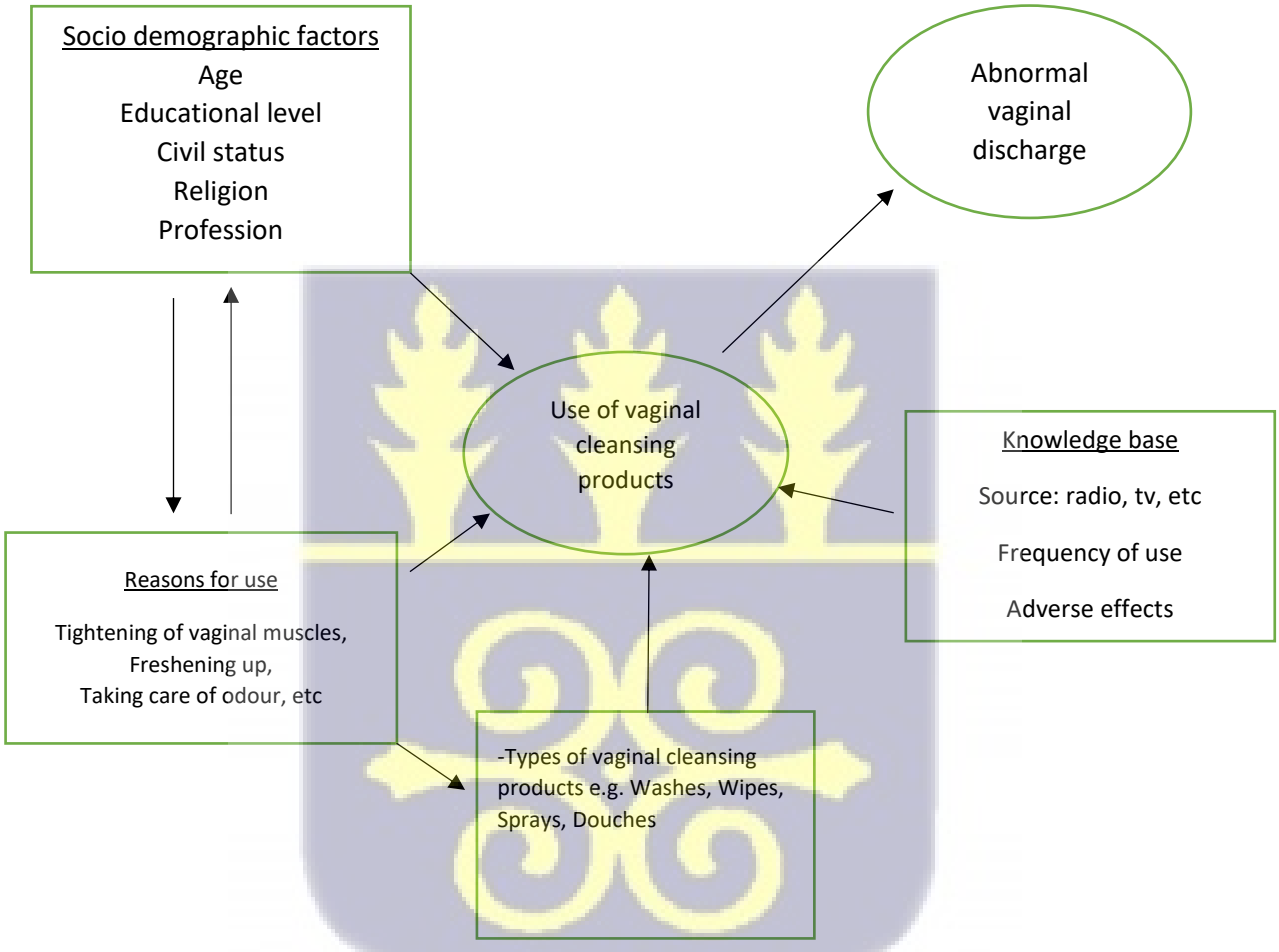
To examine the use of vaginal cleansing products and the relationship between their use and abnormal vaginal discharge among women of reproductive age (18-47 years) as well as the associated vulvovaginal symptoms.

1.5.2 SPECIFIC OBJECTIVES

1. To determine the prevalence of use of vaginal cleansing products (VCPs).
2. To determine the types of VCPs used by women.
3. To determine frequency of use of these VCPs.
4. To assess women's knowledge of vaginal cleansing products and vulvovaginal symptoms.

5. To assess if there is any relationship between the women's knowledge of vaginal cleansing products and vulvovaginal symptoms.
6. To determine the relationship between vaginal cleansing product use and abnormal vaginal discharge.

1.4 CONCEPTUAL FRAMEWORK



Self-constructed based on research conducted by Crann et al. (2018) and Chen et el. (2017)

Figure 1: Conceptual framework for the use of vaginal cleansing products and abnormal vaginal discharge

1.4.1 NARRATIVE OF CONCEPTUAL FRAMEWORK

Abnormal vaginal discharge is experienced by a lot of women worldwide. It is one of the common complaints at the gynaecology clinics. Abnormal vaginal discharge may be due to infectious and non-infectious factors. Non-infectious causes may be due to use of chemical substances in the vulvovaginal area.

The use of the vaginal cleansing products has seen a rise in the past few years as well as a concomitant increase in RTIs globally (Crann et al., 2018). These products have been portrayed in a manner to create high market appeal. Women use these products for a myriad of reasons due to socio-demographic and cultural factors such as age, religion, civil status among others. These reasons include relief from vaginal itching, vaginal tightening, to get rid of vaginal odour and vaginal discharge. The knowledge women have on these vaginal cleansing products may be informed from various advertisements on social and traditional media which portray VCPs as needed daily essentials, friends and family as well as the internet. This leads to a knowledge deficit about the use of these products as little is known of their adverse health effects. The use of these products may affect the pH and microflora of the vagina and may lead to vulvovaginal infections. Developing vaginal infections, with or without the use of these vaginal cleansing products, may result in women going to see gynaecologists in hospitals or community-based pharmacists for treatment. Previous studies have demonstrated many women use these products at least occasionally, even though not all women use VCPs (Jenkins et al., 2018). Although there are rising claims that some VCPs have potentially harmful effects, they are generally marketed as safe for use. This has therefore necessitated the need to determine the association between the use of vaginal cleansing products and abnormal vaginal discharge among women aged 18-47 years attending the Tema General Hospital.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This section presents reviewed studies on prevalence of use of vaginal cleansing and effects on the vulvovaginal environment and health promotion avenues on female intimate hygiene.

2.2 THE ANATOMY AND PHYSIOLOGY OF THE VULVOVAGINAL AREA

The vulva comprises of the mons pubis, labia, clitoris and the perineum. The pH in the vulva is usually 3.5-4.7 and it houses some microflora such as *Candida spp.* The vulva is the first line of defence to protect the genital tract from infection (Chen et al., 2017). Contaminants frequently accumulate in the vulvar folds, and increased moisture, perspiration, menstruation, and hormonal variations influence vulvar microbial development and species balance, which may lead to odour and vulvovaginal infection (Farage et al., 2017).

In terms of moisture, friction, and permeability, vulvar skin is different from other skin areas. Compared to keratinized skin, the vulvar vestibule is likely more permeable. The stratum corneum of genital skin is thin and contains large hair follicles, making it easier for microorganisms and other substances to permeate the skin (Chen et al., 2017; Farage et al., 2017).

The vagina is a fibromuscular canal that extends from the vulva to the cervix. It is primarily made up of smooth muscle and is lined with a non-keratinized epithelial lining that is thick until menopause (Chen et al., 2017). The vagina is highly vascularised and is self-cleaning as it produces mucus which protect against and destroy harmful micro-organisms (Nicole, 2014). Some components of the vaginal microflora include *Lactobacillus spp.* and *Megasphaera spp.*

2.3 INTIMATE FEMININE HYGIENE AND REPRODUCTIVE HEALTH

Countries, societies, and individuals have vastly different perspectives on reproductive health issues (Attieh et al., 2016). Women's reproductive health perceptions and behaviours are influenced by socioeconomic status, race, religion, and level of education (Alvarez-Nieto et al., 2015). Feminine hygiene practices, in particular, differ among women coming from various cultural practices, with a high prevalence of erroneous behaviours that predispose them to vulvovaginal candidiasis (Attieh et al., 2016).

Female intimate hygiene plays a significant role in the maintenance of reproductive and sexual health. The highly humid vaginal environment and as well as vaginal secretions makes it susceptible to reproductive tract infections through the creation of favourable environment for micro-organism growth (Chen et al., 2017).

2.3.1 PREVALENCE AND POSSIBLE RISK FACTORS OF INTIMATE FEMININE HYGIENE PRACTICES

Attieh and colleagues (2016) confirmed a high prevalence of the use of feminine hygiene methods in a cross-sectional study conducted among female nurses and patients. Also, intimate washing was revealed to be frequent in the study population (Attieh et al., 2016). The high prevalence of feminine hygiene practices in the study conducted by Ellie and colleagues corresponds with outcome of a multicounty household survey conducted in Africa and Asia (Hull et al., 2011). With respect to racial disposition, the prevalence of feminine hygiene practices like douching has been shown to be higher among black women (27.7 %) as compared white women (9.1 %) and Hispanics (15%) in a survey (Grimley et al., 2006). Furthermore, women who douche are more likely to use other feminine hygiene products such as sprays, wipes, powders, and bubble bath at a much higher rate than women who do not douche, and they also believe that douche products are safe (Crann et al., 2018).

In a study conducted to investigate the variation in feminine hygiene routines associated with age-related changes, 20-30% of women in all age categories reported the practice a feminine hygiene (Czerwinski, 2000). Another study conducted by Karadeniz and colleagues revealed no statistically significant difference between average genital hygiene behaviour scores of pregnant, nonpregnant, and postpartum women. However, only one-third of women had received education in genital hygiene in their life therefore, some women tend to practice incorrect genital hygiene behaviour. Also, genital hygiene behaviour was found to be higher among women with good income levels as compared to women with lower income in the same study (Karadeniz, 2019).

2.3.2 GLOBAL INTIMATE FEMININE HYGEINE PRACTICES

The WHO suggested classification for vaginal cleansing practices groups them into seven (7). These include external washing, intravaginal cleansing, external application, intravaginal insertion, oral ingestion, vaginal steaming or smoking and anatomical modification (World Health, 2012). These practices are defined below:

- "External washing refers to cleaning of the external area around the vagina and genitalia using a product or substance with or without water normally using the hand. Products used vary from soap and water, to traditional and chemical detergent-like substances specifically used to wash the vagina and genital area" (World Health, 2012).
- "Intravaginal cleansing also known as internal cleansing or washing inside the vagina includes wiping the internal genitalia with fingers and other substances (e.g., cotton, cloths, paper,) for the purpose of removing fluids. It also includes douching, which is the pressurised shooting or pumping of water or solution (including douching gel) into the vagina" (World Health, 2012).

- "External application is the placing or rubbing various substances or products to the external genitalia—that is the labia, clitoris vulva" (World Health, 2012).
- "Intravaginal insertion refers to pushing or placing something inside the vagina (including powders, creams, herbs, tablets, sticks, stones, leaves, cotton, paper, tampons, tissue, other) regardless of how long it is left inside" (World Health, 2012).
- "Vaginal steaming or smoking refers to the ''steaming'' or ''smoking'' of the vagina, by sitting above a source of heat (fire, coals, hot rocks) on which water, herbs or oils are placed to create steam or smoke" (World Health, 2012).
- "Anatomical modification is 'cutting' and 'pulling' procedures used for modifying the vagina, or restoration of the hymen; includes female genital mutilation, incision with insertion of substance into the lesion (scarification process, tattoos of the vulva or labia); excludes episiotomies or operations to repair a protruding uterus" (World Health, 2012).

Although intimate feminine hygiene practices are usually regarded as practices directly affecting the vulvovaginal area, ingestion of oral substances believed to affect the vagina and uterus in terms of vagina can be considered a common practice. This was highlighted in a WHO study conducted in 2012 across different regions of the world. Oral ingestion refers to "ingesting (drinking, swallowing) of substances perceived to affect the vagina and uterus. This includes the ingestion of substances/medicines to dry or lubricate the vagina" (World Health, 2012). According to the study, women in Yogyarkata practised oral ingestion 3 times/month which was lower compared to women in Chonburi who practised this 5 times/month (World Health, 2012).

Some of these feminine hygiene practices had undesired effects such as lesions, infections and alteration of vaginal flora which could result in increased risk of STI transmission. As a result, most clinicians and members of the American College of Obstetricians and Gynaecologist do

not recommend intravaginal cleansing (Brown et al., 2016). It is therefore important that proper hygiene practices are performed to maintain a woman's reproductive health and improve her quality of life.

2.4 VAGINAL CLEANSING PRODUCTS

A growing market exists for over-the-counter vaginal cleansing products. Douches, deodorant sprays, washes, personal wipes, and powders, for example, cost more than two billion dollars in the United States each year (Jenkins et al., 2018). Intimate hygiene products are advertised for cleanliness and odour control, but some may disturb the pH in the vulvovaginal area, affecting the composition of the normal vulvovaginal microbiota required for infection protection (Chen et al., 2017). Examples of products on the Ghanaian market include intimate washes such as Lavet, Hilady, Femfresh, Lactacyd, Duffys Feminine Kleanz, Beauty Formulars intimate wash and spray among others.

A study conducted by Janssen et al demonstrated an association between the use of vaginal gels and spontaneous preterm birth. This was linked with alteration in the vaginal microbiome leading to the spontaneous preterm delivery among pregnant women (Janssen et al., 2022). Some douching products may contain surfactant agents with destroy natural antibacterial agents, disturb mucosal membranes leading to irritation which increases susceptibility to reproductive tract infections such as bacterial vaginosis (Janssen et al., 2022). Some these vaginal cleansing products contain relatively safe chemicals which tend to cause sensitivity reactions in certain individuals.

Given the quest of many women to attain a clean vagina, some research studies have sought to understand how these products play in women's vaginal health and their bodies in general. Feminine hygiene products may contain compounds that are known or suspected to be

endocrine-disrupting chemicals (EDCs), carcinogens, or allergies, according to Women's Voices for the Earth (WVE) in a recent report. In addition, while most women use tampons and pads, black and Latina women use deodorants, wipes, powders, and douches more frequently than other women of their race, putting them at danger of chemical exposure (Nicole, 2014; Scranton, 2013).

2.5 VULVOVAGINAL INFECTIONS ASSOCIATED WITH FEMININE HYGIENE PRACTICES

The vaginal mucosa in healthy women has diverse microbiota dominated by *lactobacilli*. The balance of the vaginal microbiome is vital since it is the primary source defence against genital infections. Vulvovaginal infections are caused by micro-organisms primarily fungi commonly known as 'yeast' and bacteria (Bignoumba et al., 2022). Well-known infections include vulvovaginal candidiasis (VVC), bacterial vaginosis (BV) and Trichomoniasis (TV).

According to available literature, intravaginal cleaning is frequent among Black or African American women and may have negative consequences such bacterial vaginosis (Lewis & Diesel, 2021). Symptoms of vaginal infections include vaginal discharge, discomfort, and vaginal odour. However, these symptoms do not necessarily indicate the presence of an infection. Alternatively, these infections may be as a result of other vaginal disorders. For instance, chemicals and other substances such as hygiene products, bubble baths, laundry detergents, contraceptive foams and jellies, and synthetic undergarments, can irritate the vagina and could cause abnormal vaginal discharge and discomfort. The resulting inflammation leads to non-infectious (inflammatory) vaginitis. The use of such products may also lead to increase in vaginal pH (Oluwatosin, 2021). Furthermore, poor vaginal hygiene can also lead to infection.

2.5.1 VAGINAL DISCHARGE

In the United States alone, over 10 million primary care visits every year are due to vaginal problems. It is the most common gynaecological complaint seen by primary care physicians, yet there are high rates of misdiagnosis. It is possible for vaginal discharge to be a normal physiologic occurrence or a pathological symptom (Sim et al., 2020). A large proportion of women tend to delay or seem not to seek medical help and attention on time when they experience abnormal vaginal discharge (Ka et al., 2018).

It is typical and healthy for a woman to produce vaginal discharge from a few years before puberty until after menopause, which includes bacteria, desquamated epithelial cells, mucus, and fluid (plasma) produced by the cervix and vagina (Chen et al., 2017). Normal physiological vaginal discharge is a white or transparent, non-offensive discharge that varies over time. It is thick and sticky during the most of a woman's menstrual cycle, but becomes clearer, wetter, and stretchy for a brief time around ovulation (Rao & Mahmood, 2019). It is heavier and more visible during pregnancy, contraceptive use, and sexual activity. Due to a decline in oestrogen levels, it shrinks throughout menopause (Rao & Mahmood, 2019). Itching, discomfort, dysuria, pelvic pain, intermenstrual or postcoital bleeding, and changes in colour, consistency, volume, and/or odour are all signs of abnormal vaginal discharge (Group, 2016). Persistence of abnormal vaginal discharge strongly suggests the presence of a vaginal infection (Ka et al., 2018). Abnormal vaginal discharge can also be categorised into inflammatory and non-inflammatory (Sim et al., 2020). This type of classification is based on the origin of physical signs (Sim et al., 2020).

An abnormal vaginal discharge may be the result of a condition that affects reproductive organs other than the vagina. For instance, certain sexually transmitted infections, such as chlamydia or gonorrhoea, can cause a discharge. These bacteria can spread from the vagina to the cervix and uterus, causing pelvic inflammatory disease. Genital herpes, which can

cause blisters on the vulva, in the vagina, and on the cervix, can also result in a vaginal discharge. Abnormal vaginal discharge can also serve as a mode of transmission for HIV/AIDS (Nwadioha et al., 2010). Results from a study conducted in Canada indicates that respondents who reported using feminine washes/gels had almost 3.5 times higher odds of reporting BV (OR = 3.4, 95% CI: 1.2-10.1) ($p = .03$) and almost 2.5 times higher odds of reporting a UTI (OR = 2.4, 95% CI: 1.4-4.3) ($p < .01$) (Crann et al., 2018) of which abnormal vaginal discharge is associated with. Furthermore, according to a study done in Kano, Nigeria, abnormal vaginal discharge was seen in young female adults in particular, and 70% of genital swabs tested positive for micro-organisms, primarily *Gardnerella vaginalis* and *Candida* species (Ka et al., 2018). As a result, there is an urgent need to act quickly in cases of abnormal vaginal discharge (Ka et al., 2018).

2.5.2 VULVOVAGINAL CANDIDIASIS

Vulvovaginal candidiasis most commonly occurs in reproductive-aged women (Willems et al., 2020). It is a result of overgrowth of fungi, frequently being Candida spp. Especially C. albicans in the vaginal environment. 70% of women report having experienced vulvovaginal candidiasis at some point in their lives, and it accounts for about one-third of all cases of vulvovaginitis among women of reproductive age (Willems et al., 2020). Recurrent vulvovaginal candidiasis affects about 8% of women (Willems et al., 2020). Other species involved include C. glabrata and C. krusei (Jacob et al., 2018).

If untreated, VVC can cause PID, which can result in infertility in non-pregnant women, and chorioamnionitis, which can cause abortion and preterm birth in pregnant women. (Abbas et al., 2016). Moreover, the close proximity of the anus from the anatomical perspective, makes it easier for intestinal organisms, such as *Candida sp.*, to migrate from the anus to the vagina

(Zeng et al., 2018). The thickening of vaginal discharge, like cottage cheese, together with vaginal and vulvar pruritus, discomfort, burning, erythema, and/or oedema are indications of uncomplicated VVC. External dysuria and dyspareunia may also occur (van Schalkwyk et al., 2015). Risk factors of VVC include age, hygienic habits, disease history such as diabetes and hypertension, and other aspects. Some women, however, tend to develop recurrent VVC which involves experiencing about four or more episodes in a year of the above stated symptoms (Denning et al., 2018). This is usually a long-term condition managed on suppressive therapy but negatively impacts the quality of women (Denning et al., 2018). Most women who have experienced recurrent VVC generally feel unclean (Denning et al., 2018) Results from studies conducted by Fashemi et al. indicate that regular use of these vaginal cleansing increases susceptibility to vulvovaginal infections such as vulvovaginal candidiasis.

2.5.3 BACTERIAL VAGINOSIS (BV)

Bacterial vaginosis is a common cause of abnormal vaginal discharge among women of reproductive age. Although about 50% of women at the time of diagnosis are asymptomatic, some women who experience vaginal discharge and offensive vaginal odour have appreciable distress (Hay, 2014). Bacterial vaginosis is characterised by a decrease in lactobacilli species, which is associated with a rise in vaginal pH and an overgrowth of anaerobes in the vaginal microbiota. These anaerobes include *Gardnerella vaginalis* and *Atopobium vaginae*. Some studies have demonstrated that bacterial vaginosis maybe sexually transmitted as some women show symptoms after sexual intercourse. It can also predispose them to sexually transmitted infections (STIs) (Bagnall & Rizzolo, 2017). The practice of douching is associated with BV can increase the risk of pelvic inflammatory disease, endometriosis among others (Gondwe et al., 2020). A study conducted in the US, show positive association

between use of feminine hygiene deodorant spray and bacterial vaginosis (Klebanoff et al., 2010). These needs further evaluation as few studies have been conducted in this area.

2.5.4 OTHER INFECTIONS

Infections such as gonorrhoea, chlamydia, cervicitis, trichomoniasis among others that are sexually transmitted infections are also associated with abnormal vaginal discharge. Trichomoniasis is the most common non-viral Sexually Transmitted Infection (STI) worldwide; the World Health Organization (WHO) estimates that 170 million to 190 million cases are diagnosed annually.(Asmah et al., 2017). Previous studies have also reported a 13.3% prevalence in African American women (Asmah et al., 2017; Sutton et al., 2007). One million STIs are estimated to occur daily, with the majority occurring in SSA, according to the World Health Organisation (WHO, 2022). Infections with one of the four STIs, *C. trachomatis, N. gonorrhoeae, T. pallidum* (syphilis), *or T. vaginalis* (TV) were expected to total 374 million in 2020 (WHO, 2022). These infections cause abnormal vaginal discharge. There has been established association between dysbiosis and these other infections, however the occurrence of vaginal discharge is low (Chen et al., 2017). A recent study that combined data from 11 prospective cohort studies in sub-Saharan Africa discovered that women who used intravaginal cleansing products had greater risks of HIV acquisition than those who only used water to clean their genitals (Low et al., 2011). The use of vaginal cleansing products may also mask STIs and lead to late diagnosis and treatment (Ott et al., 2009).

2.6 ROLE OF MICROBIOTA AND PHYSIOLOGICAL CHANGES IN VAGINAL HEALTH REGULATION

The vaginal environment plays a key role in women's health. Both fertility and life quality are impacted. The intrinsic defence mechanisms that prevent vulvovaginal infections include normal vaginal flora, an acidic vaginal pH, and vaginal discharge (Chen et al., 2017). Several biological processes depend on vaginal discharge. It hydrates the mucosa of the genital tract, lubricates the lower genital tract during sexual activity, and, depending on the phase of the menstrual cycle, allows or prevents sperm cells from ascending toward the egg (Lacroix et al., 2020). The endocervical epithelium is the primary source of vaginal discharge. Cervicovaginal mucus (CVM) is formed when a number of host-secreted compounds, cellular debris and vaginal microbiome interact as a result of the endocervical mucus moving via the cervical canal to the vaginal cavity (Lacroix et al., 2020). In order to maintain the vaginal mucosal barrier, vaginal flora require a critical ecological niche, which is provided by vaginal discharge. Vaginal bacteria contribute to the maintenance of an acidic pH and compete with external pathogens for adhesion to the vaginal mucosa. In addition, they defend against pathogens by producing antimicrobial compounds, such as bacteriocin and defensin (Chen et al., 2017).

The microbial environment of the vagina varies according to race/ ethnicity and biogeographical regions with Blacks and Hispanics harbouring more anaerobic bacterial species compared to other groups. They also showed increased

vaginal pH in the presence or absence of clinical infection. Variations in lifestyle choices and gene-environment interactions may also be associated with variations in vaginal microbiota prevalence (Amabebe & Anumba, 2018). Compared to non-pregnant women, the vaginal microbiota of low-risk pregnant women has decreased richness and diversity and increased lactobacilli concentrations. An abnormal vaginal microbiome has been previously linked with preterm birth (Freitas et al., 2017).

The vaginal pH ranges from 3.8 to 4.7. Various factors may affect it including internal and external factors. Internal factors comprise of sweat, urine, vaginal discharge among others while external factors include cosmetic products, detergents, soap, etc (Chen et al., 2017). As the vaginal mucosa is a rich source of lactic acid, a by-product of oestrogen-regulated anaerobic glucose metabolism, there is a correlation between vaginal pH and total lactate concentration. Additionally, Lactobacillus bacteria and other species convert extracellular glycogen to lactic acid. Consequently, the total amount of lactic acid produced by the vaginal mucosa and microbial flora determines the vaginal pH. (Chen et al., 2017).

2.7 KNOWLEDGE ON VAGINAL CLEANSING PRODUCTS

Previous studies have shown that many women use these products, at least occasionally, as part of their vaginal health and hygiene habits, even though not all women use them (Jenkins et al., 2018). Knowledge on vaginal cleansing products is mostly drawn from the media (advertisements on mass and social media). There are also traditional or home-made vaginal cleansing recipes or products. Most women who use these products have bought into the idea of the need for a clean and fresh vagina and so use these products on a regular basis. Others, see it as a necessity to include it in their routine hygiene practices. Majority of women are aware of the fact that the vagina has a normal physiological discharge but still use these products frequently though it has negative health consequences. Some women use these products on as a means of infections as some are marketed as such. Women regard their reproductive health issues as private and sensitive due to socio-cultural reasons and resort to these vaginal cleansing products or home-made recipes for symptom cessation or case management.

A few committees and associations have proposed some guidelines concerning feminine hygiene which includes vaginal cleansing. These bodies include the Royal College of

Obstetricians and Gynaecologists (RCOG) and the Middle East and South Asia (MECA) committee on feminine hygiene.

Box 1. RCOG guidance on care of vulvar skin.[57]

- Most women with a vulvar disorder (e.g. contact dermatitis, vulvovaginitis) need advice about vulvar skin care and how to avoid contact irritants.
- Washing with water can cause dry skin and make itching worse. Use a small amount of soap substitute and water to clean the vulva.
- Shower rather than bathe and clean the vulva only once a day. Overcleaning can aggravate vulvar symptoms (e.g. symptoms of contact dermatitis). An emollient may be helpful.
- Avoid using sponges or flannels. Just use your hand. Gently pat dry with a soft towel.
- Wear loose-fitting silk or cotton underwear. Avoid close-fitting clothes. Wear loose-fitting trousers or skirts and replace tights with stockings. You may prefer to wear long skirts without underwear.
- Sleep without underwear.
- Avoid fabric conditioners and biological washing powders. Consider washing underwear separately in a non-biological laundry detergent.
- Avoid using soap, shower gel, scrubs, bubble bath, deodorant, baby wipes, or douches on the vulva.
- Some over-the-counter creams, including baby or nappy creams, herbal creams (e.g. tea tree oil, aloe vera), and "thrush" treatments, may include irritants.
- Avoid using panty liners or sanitary towels on a regular basis.
- Avoid antiseptic (as a cream or added to bath water) in the vulvar area.
- Wear white or light colored underwear. Dark textile dyes (black, navy) may cause an allergy, but if new underwear is laundered before use, it will be less likely to cause a problem.
- Avoid using colored toilet paper.
- Avoid wearing nail varnish on fingernails if you tend to scratch your skin.

RCOG: Royal College of Obstetricians and Gynaecologists.

Figure 2: RCOG guidelines on feminine hygiene as depicted by Chen et al. (2017)

Both the RCOG and MECA guidelines recommend the use of hypoallergenic products to cleanse the vulvovaginal area. However, some schools of thought, disagree with this notion and hold the view that these vaginal cleansing products affected the vaginal microbiome and overall reproductive health of women.

CHAPTER THREE

3.0 METHODS

3.1 STUDY DESIGN

A hospital-based cross-sectional study was carried out at the Tema General Hospital. Female patients at the gynaecology clinic and pharmacy department were selected using convenience sampling.

3.2 STUDY AREA

Tema metropolis is an economic and industrial centre is also, one of the cosmopolitan areas in the Greater Accra Region. It is about 30 kilometres to the east of Accra, the nation's capital, is the seaside area of Tema Metropolis. Its borders are shared with the Gulf of Guinea, the Dangme West District, Ledzokuku Krowor Municipality, Adentan Municipality, Ga East Municipality, Akuapim South District, and northeast, south-west, north-west, north, and south, respectively.

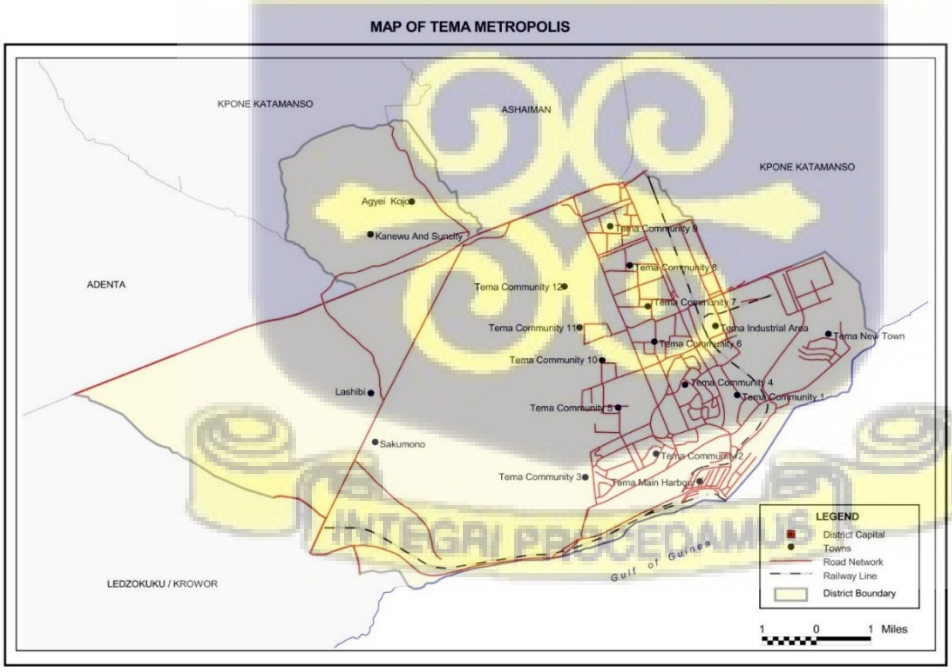


Figure 3: Map of Tema Metropolis

The Tema General Hospital was constructed in 1954 with the aim of taking care of the health and well-being of the workers who constructed the Tema Harbour. It was later handed to the government for public use in 1964. The Tema General Hospital is the biggest hospital and major referral centre in the Tema Metropolis. It is categorised as a secondary health facility and is located at Tema Community nine (9). Since the hospital is surrounded by good road network, it makes it easily accessible to the catchment area which comprises of Tema metropolis and surrounding satellite towns and villages. The Tema General Hospital has ten (10) wards and 280 to 300 bed capacity of 80%. The hospital has several departments which includes Surgical, Dental, Physiotherapy, Accident & Emergency, Obstetrics & Gynaecology, Internal Medicine among others. Both in-patients and outpatients receive medical care from the hospital. It provides services to every community in Tema, among them Nungua, Teshie, Spintex, Sakumono, Tema New Town, Manhean, Ashaiman, and Afienya. (Ghana Statistical Service, 2014).

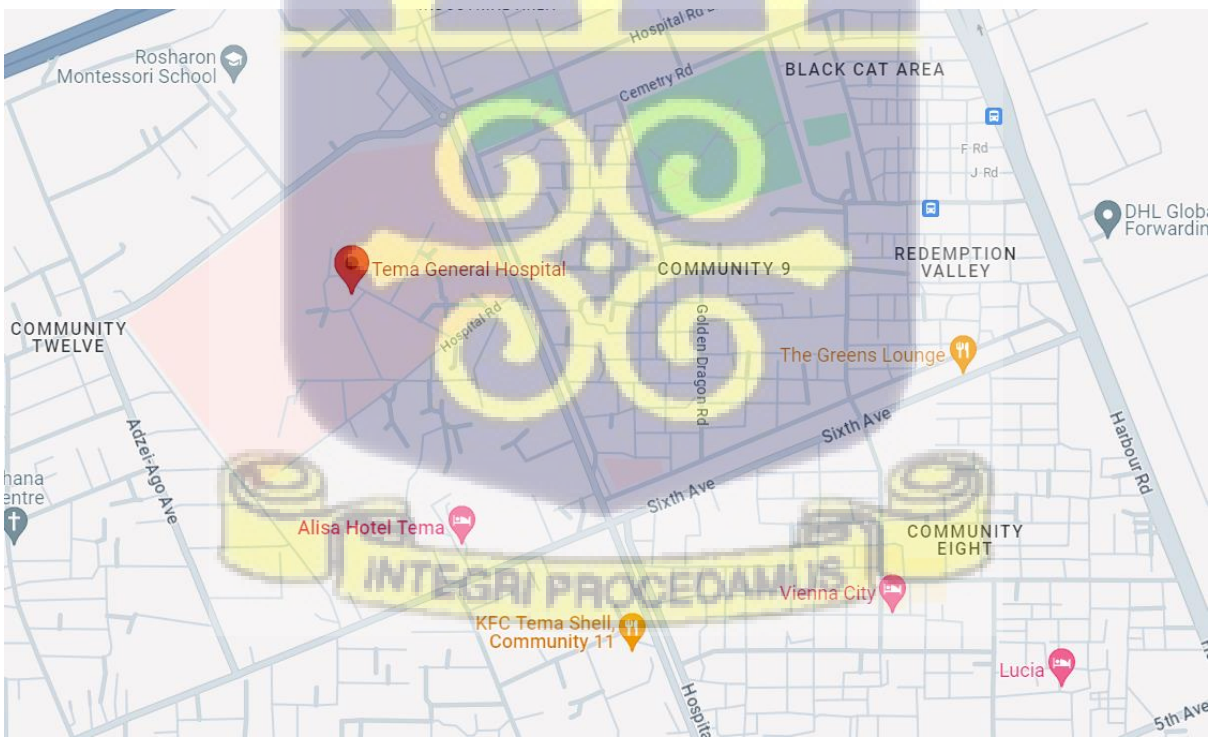


Figure 4: A map showing the location of the Tema General Hospital in Tema

3.3 STUDY VARIABLES

Table 3.1: Study Variables

Dependent Variable	Independent Variables
Abnormal vaginal discharge - Change in colour, consistency/texture and odour of vaginal discharge.	- Socio-demographic factors (age, profession, religion, civil status, educational level) -Knowledge about VCPs - Knowledge about AVD - Use of VCPs -Awareness of VCPs -Sexual activeness -Pregnancy status

3.4 DEFINITION & MEASUREMENT OF VARIABLES

VARIABLE	OPERATIONAL DEFINITION	SCALE OF MEASURE
Abnormal vaginal discharge	Respondent's description of abnormal vaginal discharge in terms of colour, texture and odour	Colour: yellow, brown, white, transparent, clear or any other Texture: mucoid, frothy, thin, thick white or any other Odour: Non-offensive, offensive, fishy

Age	Age of respondent at last birthday	18-22 23-27 28-32 33-37 38-42 43-47
Civil status	Civil status of the respondent	Single Married Divorced Widowed Co-habiting
Educational level	Highest educational level attained by respondent	None JHS SHS Vocational/ Technical Tertiary
Profession	Profession/occupation of respondent	Professional/Managerial/Technical Clerical Sales & Services Skilled manual Unskilled manual Agriculture Other
Religion	Religious group of respondent	Christian Muslim Traditionalist Other
Knowledge of VCPs	Respondent's level of knowledge of VCPs	Adequate Average Inadequate
Knowledge of AVD	Respondent' knowledge of vulvovaginal symptoms	Change in Colour Consistency/ texture Odour of vaginal discharge

Use of VCPs	Usage of VCPs by respondent	Yes No
Awareness of VCPs	Awareness of VCPs by respondent	Yes No
Sexual activeness	Respondent's indulgence in sexual activity	Yes No
Pregnancy status	Pregnancy status of respondent	Pregnant Not pregnant

3.5 STUDY POPULATION

The study population consisted of all females of reproductive age who visited the Tema General Hospital during the data collection period provided they consented to participate in the study. Female patients specifically attending Obstetrics and Gynaecology clinic, Out-patients department (OPD) as well as those waiting at the Pharmacy department were admitted into the study.

3.5.1 INCLUSION CRITERIA

i. Females of reproductive age (18-47 years) who attended obstetrics and gynaecology clinic, OPD and pharmacy departments at the Tema General Hospital during the study period.

3.5.2 EXCLUSION CRITERIA

i. Females who have participated in a similar study recently to prevent bias in responses.

ii. Females who may have difficulty providing informed consent.

3.6 SAMPLE SIZE

The sample size was estimated using prevalence rate from previous studies (Ka et al., 2018).

Hence, the formula n= $\frac{z^2*(p)(q)}{d^2}$ was used to calculate the sample size.

n = sample size

z = normal standard deviation = 1.96 at 95% confidence interval

p = prevalence rate = 55.6%

q = 1-p

d = margin of error

n = $\frac{1.96^2*(0.556)(0.444)}{(0.05)^2}$

n = 380

From previous studies, percentage of missing data was between 5 and 10%. Therefore, the minimum sample size of 380 was adjusted by approximately 10% to cater for this.

3.7 SAMPLING METHOD

3.7.1 SELECTION OF HEALTH FACILITY.

For this study, the Tema General Hospital was purposely selected because it is the district hospital for the whole Tema Metropolis. This is the main referral centre in the Tema Metropolis and therefore has a wide range of coverage. The Tema General Hospital has ten (10) wards and 280 to 300 bed capacity of 80%. The hospital has several departments which includes Surgical, Dental, Physiotherapy, Accident & Emergency, Obstetrics & Gynaecology, Internal Medicine among others. The hospital provides both inpatient and outpatient medical care. It serves the entire Tema region, including Nungua, Teshie, Spintex, Sakumono, Tema New town, Manhean, Ashaiman, and Afienya, among others. (Ghana Statistical Service, 2014).

3.7.2 SELECTION OF PARTICIPANTS

The consecutive sampling method was used. Daily recruitment of female patients at the Tema General Hospital who were interested in the study continued until the target sample size was obtained. A research assistant was stationed at the gynaecology clinic department, OPD and pharmacy department respectively on daily basis to collect data from female patients waiting to be attended to who met the inclusion criteria. The participants/respondents were administered the electronic semi-structured questionnaire in a face-to-face interview format.

3.8 DATA COLLECTION TECHNIQUES

All participants who met the inclusion criteria were administered a semi-structured electronic questionnaire containing both open- and closed-ended questions. Face-to-face interviews were conducted to obtain information from the patients. Participants' informed consent was obtained before administering the questionnaire. The purpose of the study was carefully explained to the participants and if they agreed to participate in the study, they were made to sign or thumbprint the consent forms. Then they were allowed to complete the questionnaire.

3.9 DATA PROCESSING

The questionnaire data was downloaded into Microsoft Excel 2019 and checked for completeness and accuracy. The data was cleaned by recognizing all incorrect entries and correcting them using the questionnaire's codes. The data was saved as an Excel file and exported to STATA for statistical analysis.

3.10 DATA ANALYSIS

STATA version 17.0 was used for all statistical analysis for this study. Descriptive statistics such as frequencies and percentages were used to describe socio-demographic data of respondents. Chi-square test and fisher's exact test were used to test association between abnormal vaginal discharge and independent variables, including socio-demographic variables and use of vaginal cleansing products. Multiple logistics model was used to determine factors influencing abnormal vaginal discharge and feminine hygiene product use after adjusting for confounders. Knowledge on VCPs was assessed using the five parameters listed below. These include; awareness of VCPs, VCP definition, type of VCP known, reason(s) for VCP use and frequency of VCP use. This tool for measurement of knowledge of VCPs was self-constructed based on works done by Crann et al. (2018) and Chen et al. (2017). Knowledge on vulvovaginal symptoms were assessed based on responses to the questions on consistency, colour and odour of AVD as well as other symptoms linked with AVD. This tool for assessing knowledge on vulvovaginal symptoms was adopted from Ilankoon (2018) in her paper 'Vaginal Discharge Assessment form for Utilization by Primary Health Care Workers in a Community Setting.'

Table 3.2: ASSESSMENT OF KNOWLEDGE ON VCPs

Total Score	Rank
4-5	Adequate knowledge
2-3	Average knowledge
< 2	Inadequate knowledge

3.11 ETHICAL CONSIDERATIONS

Ethical approval for the study was obtained from the Ethics Review Committee of the Ghana Health Service (GHS), which was done through the School of Public Health at the University of Ghana. Permission was also be taken from the Tema Metro Health Directorate and the management of the Tema General Hospital. Respondents were informed about the study and the various ethical principles such as voluntary participation and withdrawal, privacy and confidentiality, risk and benefit, compensation, declaration of conflict and interest. Respondents were sensitized that though they may not receive any monetary or material compensation, data collected from them was going to inform policy concerning VCPs and lead to some interventions if need be. Furthermore, patients were made aware of possible risks as some questions were sensitive and may cause feelings of embarrassment. Respondents were also advised to divulge any reservations that may affect the authenticity of the information they would provide before consenting to partake in the study. Respondents remained anonymous as their names were not captured during the interview process but were identified using ID codes. An informed written consent was obtained from the individual participants before interviewing them.

3.11.1 PRIVACY/CONFIDENTIALITY

Information retrieved from participants was kept confidential and was not disclosed to anyone. Identities of participants would not be revealed in publications or reports that would ensue from the study. Data collected, both hard copy and digital format would be used for the purpose of analyses only.

3.11.2 VOLUNTARY WITHDRAWAL

The participation of each participant in this study was fully voluntary. He/she was permitted to ask as many questions as necessary to have a better understanding. A participant was permitted to withdraw participation at any time during the study, without reason, if desired.

3.11.3 CONSENTING PROCESS

Every participant was guided through the consenting procedure, which included explaining the purpose of the study, its possible benefits to the community and nation, and any potential risks associated. He/she was informed that participation was fully optional and that he/she may opt out at any moment. Before the questionnaire was delivered, each participant signed or thumb printed the consent form to demonstrate consent.

3.11.4 DATA STORAGE AND USAGE

Each participant was informed in detail that all information collected will be held in files under lock and key. At the conclusion of the study, all personally identifiable information will be irretrievably erased.

CHAPTER FOUR

4.0 RESULTS

This chapter provides a summary of background characteristics of respondents, evaluation of respondents' knowledge on vaginal cleansing products, frequently used vaginal cleansing products, reasons for vaginal cleansing products use, prevalence of vaginal cleansing product use, and relationship between vaginal cleansing product usage and past experience of abnormal vaginal discharge. A total of 412 who consented to take part in the study were surveyed.

4.1 Demographic characteristics of respondents

The number of female respondents who partook in the study was 412. The modal age group is 28-32 (25.24%) and the median age group is also 28-32. Over half of the study population had attained second cycle education (54.13%). The percentage of the population who had JHS education and Technical & Vocational Training were equal in measure (15.53%). The respondents were predominantly Christian (78.88%) with large proportions being single (40.53%) and married (30.10%). A majority of the female respondents were engaged in Sales & Services (32.27%) as well as Professional/Technical/Vocational jobs (31.78%).

The number of female respondents who were aware of VCPs was 76.61% and the use of VCPs among participants was 74.03%. The tables below provide a summary of the socio-demographic characteristics of respondents.

Table 4. 1: Socio-demographic characteristics of studied population

Age	**Frequency (n)**	**Percentage (%)**
18-22	79	19.17
23-27	81	19.66
28-32	104	25.24
33-37	62	15.05
38-42	55	13.35
43-47	31	7.52
Civil Status		
Single	167	40.53
Married	124	30.10
Divorced	24	5.83
Widowed	18	4.37
Co-habiting	79	19.17
Level of education		
No education	5	1.21
JHS	64	15.53
SHS	223	54.13
Technical/ Vocational	64	15.53
Tertiary	56	13.59
Religious group		
Christian	325	78.88
Muslim	82	19.90
Other	5	1.21
Occupation		
Professional/Technical/Vocational	130	31.78
Clerical	8	1.96
Sales & Services	132	32.27

Skilled Manual	96	23.47
Unskilled Manual	6	1.47
Agriculture	37	9.05

Table 4. 2: Awareness of VCPs among respondents at Tema General Hospital (TGH)

Awareness of VCPs	Frequency (n)	Percentage (%)
Yes	328	79.61
No	84	20.39
Total	**412**	**100.00**

Table 4. 3:Use of VCPs among respondents at Tema General Hospital (TGH)

Use of VCPs	Frequency (n)	Percentage (%)
Yes	305	74.03
No	107	25.97
Total	**412**	**100.00**

Table 4. 4: Sexual activeness of respondents at TGH

Sexual Activeness	Frequency (n)	Percentage (%)
Yes	293	71.12
No	119	28.88
Total	**412**	**100.00**

4.2 Respondents history of use of vaginal cleansing products

As illustrated in Table 4.9 below, respondents who indicated they had used vaginal cleansing products in the past six months were of a comparatively higher education background than those who indicated otherwise. Similarly, use of vaginal cleansing products was comparatively higher among respondents who were aware of the products as compared to those who did not know about the vaginal cleansing products.

Among the 23-27 years and 28-32 years age groups, respondents that indicated they had used vaginal cleansing products in the past six months were nine times more than those that indicated otherwise. The use of vaginal cleansing products was also higher among single and married women, as compared to divorced and widowed respondents.

Majority of respondents who indicated that they had used vaginal cleansing products in the past six months had either professional and managerial jobs, or were into sales and services. The Table below provides a summary of background characteristics of patients in the study population that had used vaginal cleansing products in the past six months.

Table 4. 5: Background Characteristics of Respondents with prior exposure to vaginal cleansing products

Independent variable	Vaginal cleansing products usage in past 6 months				P-value
	Yes	%	No	%	
Age					
18-22	47	15.41	32	29.91	<0.001
23-27	62	20.33	19	17.76	
28-32	94	30.82	10	9.35	
33-37	43	14.10	19	17.76	
38-42	42	13.77	13	12.15	
43-47	17	5.57	14	13.08	
Civil Status					0.040
Single	119	39.02	48	44.86	
Married	101	33.11	23	21.50	
Divorced	21	6.89	3	2.80	
Widowed	11	3.61	7	6.54	
Co-habiting	53	17.38	26	24.30	
Level of Education					0.080
None	4	1.31	1	0.93	
JHS	42	13.77	22	20.56	
SHS	161	52.79	62	57.94	
Vocational/Technical	49	16.07	15	14.02	
Tertiary	49	16.07	7	6.54	
Religious group					0.216
Christian	242	79.34	83	77.57	
Muslim	61	20.00	21	19.63	
Other	2	0.66	3	2.80	
Occupation					0.001
Professional/Technical/Managerial	108	35.53	22	20.95	
Clerical	4	1.32	4	3.81	
Sales & Services	104	34.21	28	26.67	
Skilled Manual	57	18.75	39	37.14	
Unskilled Manual	3	0.99	3	2.86	
Agriculture	28	9.21	9	8.57	
Pregnancy Status					0.655
Yes	76	24.92	29	27.10	
No	229	75.08	78	72.90	
Awareness of VCP					<0.001
Yes	282	92.46	46	42.99	
No	23	7.54	61	57.01	
Sexual activeness					<0.001
Yes	242	79.34	51	47.66	
No	63	20.66	56	52.34	

4.3 Awareness of vaginal cleansing products

Table 4.10 below shows that, awareness of vaginal cleansing products was comparatively higher among respondents with at least senior high school education as compared to respondents with a lower educational background. Also, awareness of vaginal cleansing products was highest among respondents aged 18-37 years. With respect to civil status, awareness was higher among single and married respondents as compared to divorced and widowed respondents.

Generally, awareness of vaginal cleansing products was higher among respondents who confirmed they had used vaginal cleansing products in the past 6 months. There were more Christian females than Muslim females in the study population. Majority of respondents who indicated that they were aware of vaginal cleansing products had either professional and managerial jobs, or were into sales and services. The Table below provides a summary of background characteristics of patients in the study population with or without awareness of vaginal cleansing products.

Table 4. 6: Characteristics of Respondents with awareness of vaginal cleansing products

Independent variable	Awareness of Vaginal Cleansing Products				P-value
	Yes	%	No	%	
Age					
18-22	62	18.90	17	20.24	<0.001
23-27	65	19.82	16	19.05	
28-32	94	28.66	10	11.90	
33-37	48	14.63	14	16.67	
38-42	45	13.72	10	11.90	
43-47	14	4.27	17	20.24	
Civil Status					0.002
Single	133	40.55	34	40.48	
Married	103	31.40	21	25.00	
Divorced	22	6.71	2	2.38	
Widowed	8	2.44	10	11.90	
Co-habiting	62	18.90	17	20.40	
Level of Education					0.009
None	4	1.22	1	1.49	

JHS	47	14.33	17	20.24	
SHS	169	51.52	54	64.29	
Vocational/Technical	56	17.07	8	9.52	
Tertiary	52	15.85	4	4.76	
Religious group					0.377
Christian	261	79.57	64	76.19	
Muslim	64	19.51	18	21.43	
Other	3	0.91	2	2.38	
Occupation					0.003
Professional/Technical/Managerial	117	35.78	13	15.85	
Clerical	5	1.53	3	3.66	
Sales & Services	103	31.50	29	35.37	
Skilled Manual	68	20.80	28	34.15	
Unskilled Manual	4	1.22	2	2.44	
Agriculture	30	9.17	7	8.54	
Pregnancy Status					0.909
Yes	84	25.61	21	25.00	
No	244	74.39	63	75.00	
Use of VCP					<0.001
Yes	282	85.98	23	27.38	
No	46	14.02	61	72.62	
Sexual activeness					0.002
Yes	245	74.70	48	57.14	
No	83	25.30	36	42.86	

4.4 Prevalence of vaginal cleansing products use

The prevalence of vaginal cleansing products (VCP) use in the study population was 74%.

The figure below provides an illustration of how the prevalence was determined.

Total study population = 412

Number of respondents who indicated they had used VCP in the past 6 months= 305

Proportion of study population who had used VCP in the past 6 months = $\frac{305}{412}$ = 0.7402

Hence, prevalence of vaginal cleansing products is 74%

Figure 5: Prevalence of Vaginal Cleansing Products

Table 4. 7: Prevalence of VCP use in the study population

Variable	Obs	Proportion	Std. err.	Binomial exact [95% conf. interval]	
	412	**.7402913**	**.0216021**	**.6951061**	**.7819864**

4.5 Types of VCPs used in the study population

The majority of women in the study population used feminine washes (88.15%), followed by the use of feminine wipes (6.95%). Feminine sprays were used the least (1.65%). This is summarised in Table 4.8 below.

Table 4. 8: Types of VCPs used in the study population

Type of VCP used	Freq. (n)	Percent (%)
Lavet Feminine Wash	116	38.16
Hilady Feminine Wash	116	38.16
Duffys Feminine Kleanz	15	4.93
Beauty Formulars Spray	2	0.66
Lactacyd Feminine Wash	15	4.93
Femfresh wash	6	1.97
Beauty Formulars Spray	3	0.99
Compact Wipes	21	6.91
Others	6	1.97
Combination of any 2	4	1.32
Total	**304**	**100**

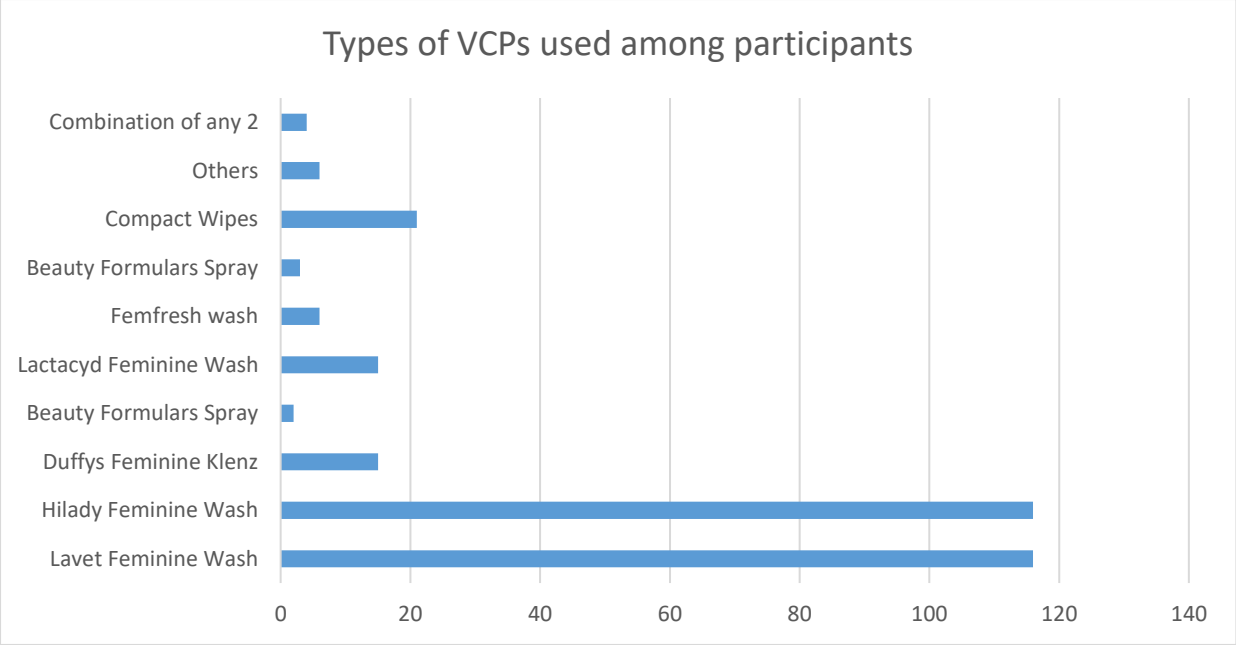


Figure 6: Types of VCPs used in the study population

4.6 Frequency of VCP use among women aged 18-47 years attending the Tema General Hospital

Majority of women (40.4%) in the study population indicated they had used vaginal cleansing products (VCPs) on a daily basis. Approximately one fifth of the study population confirmed they had used VCPs in intervals of two weeks, monthly or other intervals. Overall, compliance to usage of VCPs was appreciable as approximately 78% of the study population confirmed they had use VCPS on either daily or weekly basis, as summarized in Table 4.9 below.

Table 4. 9: Frequency of VCP use in the study population

Frequency of VCP use	Frequency	Percentage
Daily	122	40.40
Weekly	114	37.75
Every two weeks	32	10.60
Monthly	28	9.27
Other	6	1.99
Total	**302**	**100**

4.7 Relationship between use of VCPs and Abnormal Vaginal Discharge

In this study, awareness and use of vaginal cleansing product was higher among respondents that indicated they have had an abnormal vaginal discharge in the past 6 months. Bivariate analysis showed significant association between use of vaginal cleansing products and past experience of abnormal vaginal discharge as summarized in Table 4.10 below. The odds of prior experience of abnormal vaginal discharge was significantly higher among respondents who indicated they were aware of VCPs, and had used VCPs in the past 6 months (Table 4.15).

Table 4. 10: Relationship between Abnormal Vaginal Discharge and VCPs usage and awareness

Independent variable		Experience of Abnormal Vaginal Discharge in past 6 months				P-value
		Yes	%	No	%	
Awareness of VCP						<0.001
	Yes	239	86.59	89	65.44	
	No	37	13.41	47	34.56	
Use of VCP						<0.001
	Yes	229	82.97	76	55.88	
	No	47	17.03	60	44.12	

Table 4. 11: Odds of Abnormal Vaginal Discharge in study population

	Abnormal vaginal discharge		
Independent variables	Odds Ratio	P-Value	Confidence Interval
Age			
18-22	Ref		
23-27	1.22	0.540	0.642-2.325
28-32	1.84	0.057	0.981-3.456
33-37	1.35	0.392	0.674-2.726
38-42	0.77	0.473	0.386-1.558
43-47	3.35	0.025	1.165-9.676
Level of Education			
None	Ref		
JHS	0.97	0.978	0.152-6.242
SHS	1.10	0.915	0.180-6.738
Vocational/Technical	3.48	0.417	0.332-14.277
Tertiary	3.48	0.204	0.507-23.891
Use of VCPs			
No	Ref		
Yes	3.84	<0.001	2.424-6.103
Awareness of VCPs			
No	Ref		
Yes	3.41	<0.001	2.079-5.594
Sexual activeness			
No	Ref		
Yes	1.93	0.004	1.241-3.004

4.8 Assessment of Respondents' knowledge about vaginal cleansing products and abnormal vaginal discharge

With respect to knowledge assessment, the majority of respondents (69%) had adequate knowledge about vaginal cleansing products whereas a lower fraction of the study population showed they had inadequate knowledge about vaginal cleansing products.

Most people had a combination of reasons for use of VCPs. Other reasons for use of VCPs are to get rid of vaginal odour and to tighten vaginal muscles. About 14% of the respondents use VCPs for daily cleansing. This is depicted in Figure 6.

For majority of respondents who experienced AVD, the colour of the discharge was yellow. This was followed by those who experienced brown discharge and then the others as shown in Figure 7.

Most respondents had an AVD consistency of either thin or mucoid. About 50% of respondents had an offensive AVD discharge. 31% of respondents had a non-offensive AVD and 18% had a fishy AVD.

The majority of respondents who experienced AVD had adequate knowledge on it. There was a significant relationship between odour of AVD and knowledge of VCPs.

Table 4. 12: Respondents' level of knowledge about vaginal cleansing products

Knowledge	Frequency	Percent
Adequate	284	68.93
Average	59	14.32
Inadequate	69	16.75
Total	**412**	**100.00**

Figure 7: Reasons for use of VCPs among respondents

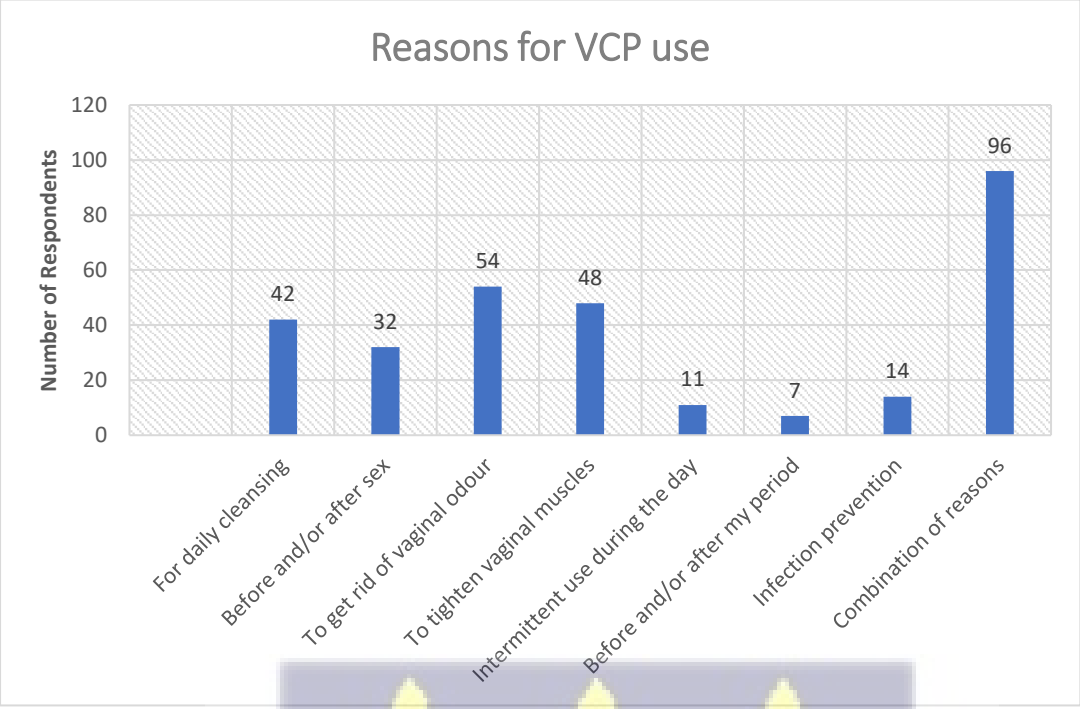


Figure 8: Colour of AVD experienced by Respondents

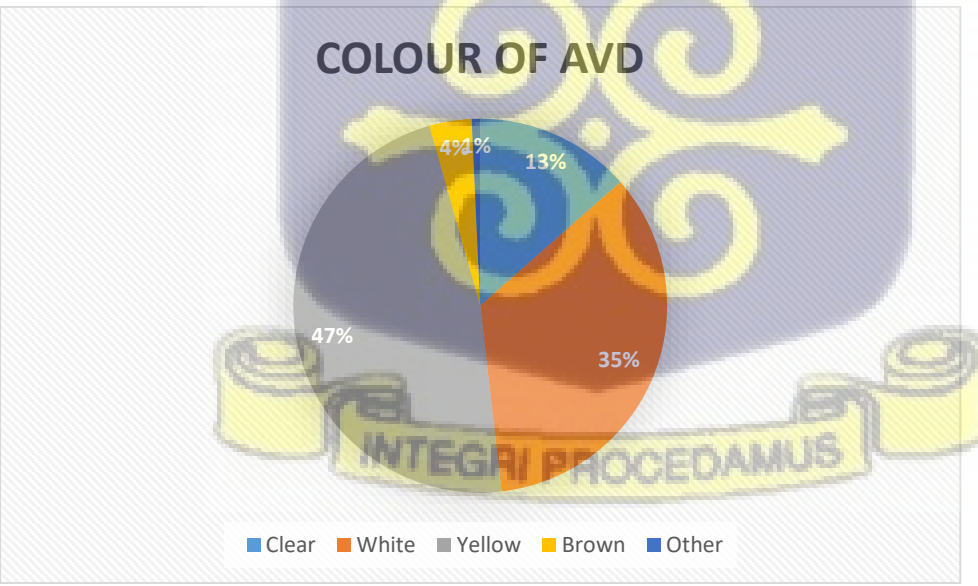


Figure 9: Consistency of AVD experienced by Respondents

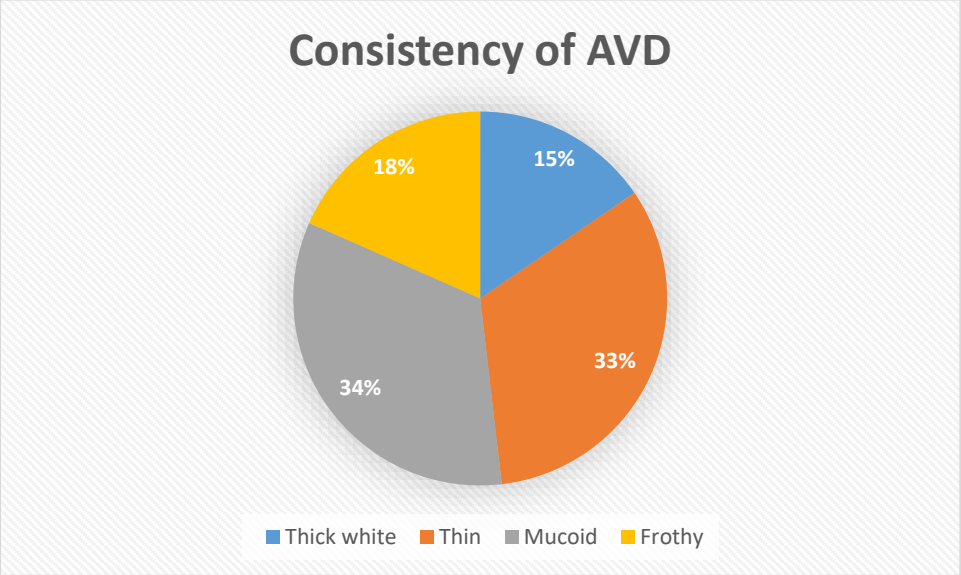


Figure 10: Odour of AVD experienced by Respondents

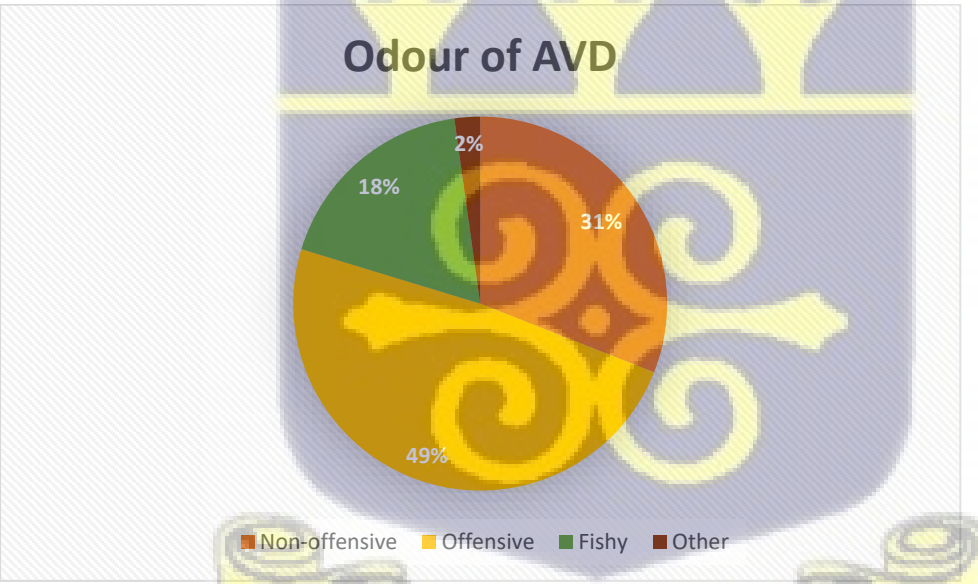


Table 4. 13: Relationship between Respondents' knowledge on VCP use and vulvovaginal symptoms

Vulvovaginal symptoms	Knowledge on VCPs						P-value
	Adequate		Average		Inadequate		
	(n)	%	(n)	%	(n)	%	
Colour of AVD							0.197
Clear	27	12.62	4	12.12	6	22.22	
White	79	36.92	8	24.24	8	29.63	
Yellow	101	47.20	18	54.55	11	40.74	
Brown	6	2.80	3	9.09	1	3.70	
Other	1	0.47	0	0.00	1	3.70	
Consistency of AVD							0.895
Thick white	33	15.49	4	12.50	5	18.52	
Thin	69	32.39	13	40.63	7	25.93	
Mucoid	71	33.33	9	28.13	11	40.74	
Frothy	40	18.78	6	18.75	4	14.81	
Odour of AVD							0.011
Non-offensive	59	27.83	13	40.63	12	44.44	
Offensive	114	53.77	7	21.88	11	40.74	
Fishy	34	16.04	11	34.38	4	14.81	
Other	5	2.36	1	3.13	0	0.00	
Other symptoms linked with AVD							0.268
Itching & scratching in the genital area	36	17.73	11	36.67	10	37.04	
Burning sensation	14	6.90	0	0.00	1	3.70	
Redness of the vagina	10	4.93	0	0.00	1	3.70	
Lower abdominal pain	25	12.32	4	13.33	3	11.11	
Pain during sex	13	6.40	0	0.00	0	0.00	
Vaginal soreness	7	3.45	0	0.00	0	0.00	
Combination of any above	98	48.28	15	50.00	12	100.00	

CHAPTER 5

5.1 DISCUSSION

Use of vaginal cleansing products is fast becoming an entrenched part of the daily hygiene routine of women around the world. These products have not been given the necessary attention, even though their use has an impact on the sexual and reproductive health of women. Studies have revealed that women who douche are most likely to use VCPs (Crann et al., 2018). Some studies have discovered that vaginal hygiene behaviours and practices including VCPs have a higher prevalence than douching in study participants(Crann et al., 2018; Suwanrattanadech et al., 2020). In some studies, participants who admitted to douching, were twice as likely to have used feminine wipes or 3.6 times more likely to have used a feminine spray (Ott et al., 2009)

Though douching has primarily been the focus of research with regards to feminine hygiene, the results of this survey identified a high prevalence (74%) of the use of vaginal cleansing products among women of reproductive age (18-47 years) attending the Tema General Hospital which is higher compared to the prevalence of douching from previous studies (Crann et al., 2018) . This is consistent with data from research carried out in Canada which estimated a high prevalence of vaginal/genital health and hygiene behaviours among individuals (Crann et al., 2018). A similar study conducted by Supannee and colleagues identified the prevalence of the use of feminine washes among Thai women to be 70.25% (Suwanrattanadech et al., 2020). Among female adolescents in a study conducted in Lebanon, the use of feminine wipes alone was found to be 27% (Attieh et al., 2016).

A number of VCPs are used worldwide. These include feminine wipes, anti-itch creams, feminine washes, powders, feminine sprays and other commercially manufactured indicated for vaginal care. The use of feminine washes accounted for 83.2% of VCPs used by participants in this study. This may be due to the fact that feminine washes are heavily promoted on

traditional media platforms (television and radio) which have a huge audience. Less than 2% of participants used 2 or more products, unlike other studies where over 64% of participants used a combination of products (Crann et al., 2018). 40.4% of the women who had used VCPs within the last 6 months used it on a daily basis and 37.75% used it on a weekly basis. This was consistent with other studies where participants also used VCPS regularly or daily (Crann et al., 2018; Grimley et al., 2006). 30% of participants who had used these products used them for a combination of reasons, including odour control, tightening of vaginal muscles and daily cleansing. Some women feel more confident in themselves when they use VCPs. It makes them feel cleaner and fresher (Jenkins et al., 2018). Some studies project the popularity of VCPs stems from negative cultural perceptions of the vagina being unclean due to physiological processes such as menstruation and normal vaginal discharge (Jenkins et al., 2018). Some women use VCPs to achieve the desired vaginal state before and after sex (Hilber et al., 2009). Some also use these products to prevent infections as their partners engage in transactional sex or have other sexual partners (Hilber et al., 2009). In order for women to obtain a desirable vaginal condition for sexual fulfilment, personal grooming, health, and wellness they engage in the use of VCPs and vaginal practices (Hilber et al., 2009; Lewis & Diesel, 2021).

From the results, a higher number of respondents indicated they were aware of VCPs compared to those who indicated they had used VCPs within the last six months. Therefore, awareness of these products precedes their use. The difference in numbers between the awareness and use of VCPs among women may be due to women being sceptical about the use of VCPs coupled with the fact that basic information on such products is unclear. A study conducted on feminine hygiene products among Thai women yielded similar responses (Suwanrattanadech et al., 2020). Use of VCPs in the past 6 months was higher among married and sexually active women. This is consistent with other studies (Grimley et al., 2006). The use of VCPs is indicated to start at the onset of menarche or marriage among women (Suwanrattanadech et al.,

2020). Other studies indicate that the use of VCPs is initiated on the diagnosis of STIs (Lewis & Diesel, 2021; Ott et al., 2009). The results indicated a positive relationship between use of VCPs and abnormal vaginal discharge ($p<0.001$). The results suggest the odds of experience of abnormal vaginal discharge is 3.84 times higher with the use of VCPs. Fashemi and colleagues linked the use of VCPs with adverse health outcomes via in vitro studies. From their research, some VCPs may be harmful to *Lactobacillus sp.*, which forms a huge portion of the microflora of the vagina. Certain vaginal cleansing products may disrupt the vaginal immunological barrier by compromising epithelial cell integrity and by altering the ability of these epithelial cells to release protective or inflammatory immune mediators (Fashemi et al., 2013). Participants from similar studies who had used VCPs were approximately three times at higher odds of reporting adverse health conditions which include VVC, BV, STIs or UTI (Crann et al., 2018). Individuals from a similar study who reported using feminine wipes were nearly twice as likely to report a urinary tract infection (OR = 1.9, 95% CI = 1.3-2.7) ($p<0.001$) (Crann et al., 2018). Similarly, those who reported using baby wipes in that same study were nearly 60% more likely to report a urinary tract infection (OR = 1.6, 95% CI: 1.1-2.3) ($p =0.02$) (Crann et al., 2018). Again, individuals who reported using feminine washes/gels had nearly 3.5 times increased chances of reporting BV (OR = 3.4, 95% CI: 1.2-10.1) ($p =0.03$) and nearly 2.5 times increased odds of reporting a UTI (OR = 2.4, 95% CI: 1.4-4.3) ($p<0.01$) (Crann et al., 2018). Crann and colleagues also reported that majority of respondents in that study had at least one vaginal symptom in their lives with itching, burning and abnormal vaginal discharge being the most prevalent. In this study, similar trends in terms of other vaginal symptoms were identified. 21% of respondents indicated itching in regards to the use of VCPs and lower abdominal pain accounted for 12% of adverse reasons reported. Abnormal vaginal discharge is commonly associated with infections. On the other hand, normal vaginal discharge is as a result of a physiological process which includes secretions from the cervical and Bartholin's

glands, as well as the desquamation of vaginal epithelial cells. This discharge is most often non-offensive, clear or white and usually occurs in women of childbearing age. Normal vaginal discharge comes out on a daily basis from the vagina with the colour and thickness changing according to the monthly menstrual cycle (Ka et al., 2018). 70% of all AVD causes are linked with BV, VVC and TV (Sim et al., 2020). AVD is most often as a result of disruption in the micro-organism environment of the vagina especially *Lactobacillus sp.* (Ka et al., 2018). VCP use is also associated with non-infectious cause of AVD. The use of VCPs, example being vaginal gel has been linked with spontaneous preterm birth (Janssen et al., 2022). AVD is usually a symptom of BV, VVC, TC and STIs. Some studies also propose the need for suitable external feminine washes to reduce risk of vulvovaginal disorder and to improve overall intimate health of women (Chen et al., 2017).

From our results, approximately 69% had adequate knowledge on VCPs. This is in contrast to results from previous studies were adequate knowledge was less (Suwanrattanadech et al., 2020). This may be due to heavy advertisement of VCPs in mass media in Ghana. Issues regarding reproductive health are deemed sensitive in Ghanaian, hence they are not openly discussed. Most women seek knowledge on VCPs from mass and social media, and family and friends. However, women in North America demonstrate good knowledge on the use of VCPs (Crann et al., 2018) and also divulge information regarding the use of these products to their health practitioners (Lewis & Diesel, 2021).

From the assessment between vulvovaginal symptoms and knowledge on VCP use, there is a significant relationship between odour of vaginal discharge and knowledge on VCP use ($p = 0.011$). This supposes that the smell of the vaginal discharge influences the use of VCPs among participants of the study. This shows that the respondents have interest in self-care and wellbeing. The use of these VCPs is also situated in culture, where women for fear of losing

sexual partners due to unpleasant odour from their vagina resort to VCP use (Hilber et al., 2009; Jenkins et al., 2018). Colour, consistency and other symptoms linked with AVD did not show association with knowledge. This may be due to the fact that most women would not result to use of VCP as their first resort with the onset of these symptoms. Women tend to seek medical or professional help with the onset of change in colour and consistency of vaginal discharge as well as related symptoms.

Looking at participants perceptions regarding vaginal health practices, over 90% affirmed that the inside of the vagina should be washed with water. This is synonymous to douching. Most women practise douching using water in Ghana (Ziba et al., 2019). Douching refers to washing inside the vagina with water or a mixture of other fluids (Yanikkerem & Yasayan, 2016). From previous studies, women who douched also use VCPs (Crann et al., 2018). About 49% participants indicated that they perceived VCPs to have anti-infective properties. This was demonstrated by Ott and colleagues in their research where young adolescents engaged in the use of VCPs when diagnosed with STI (Ott et al., 2009). Over 50% of participants perceived VCPs as unharmful and approximately 30% of respondents indicated that they were unsure whether VCPs are harmful or not. This shows that women need to be properly sensitized on the use of VCPs and its appropriate indication.

5.2 STRENGTHS OF THE STUDY

1. This study focused on other vaginal cleansing products other than the use of a douche and their effect on the health of women. This is the first of its kind in Ghana.

2. The results of the study were consistent with similar research conducted in different jurisdictions.

5.3 LIMITATIONS OF THE STUDY

1. There might be some form of recall bias as participants were asked to recall certain health events that occurred over a six-month period. In addition, since feminine hygiene (vaginal cleansing) is a sensitive issue, participants might not have been able to express their views thoroughly.

2. Participants were not asked whether or not they used these products intravaginally

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

The prevalence of use of vaginal cleansing products (VCPs) among female participants at the Tema General Hospital was high. Majority of the study population at TGH were aware of vaginal cleansing products and a greater number of respondents had used these products within the past six months. Majority of respondents used feminine washes with fewer numbers using feminine wipes and feminine sprays respectively. These products were used by respondents for diverse reasons, some of which include infection prevention, prevention and control of vaginal odour, for vaginal tightening and other reasons. These vaginal cleansing products were more frequently used on a daily basis among participants. This observation indicates that relevant stakeholders especially healthcare professionals would have to educate women especially those within the age bracket of 18-35 years on vaginal cleansing products and their proper use.

All participants had experienced abnormal vaginal discharge at some point within the past six months. Participants were able to determine whether they had an abnormal discharge due to the change in colour, consistency and odour of vaginal discharge as well as associated symptoms such as itching, redness of the vulva, lower abdominal pain among others. The study identified a relationship between use of vaginal cleansing products (VCPs) and abnormal vaginal discharge. This suggests that female patients who visit gynaecology clinics do not disclose use of VCPs to health professionals and hence must be encouraged to disclose such information during counselling. Participants predominantly displayed adequate information on VCPs but their source of knowledge was mainly mass and social media, and family and friends. Health professionals especially those in the Obstetrics and Gynaecology department must be encouraged to sensitize women on the use of VCPs.

An association between knowledge on VCPs and odour of vaginal discharge was demonstrated. This indicates that participants were generally concerned with the odour of their vaginal discharge, and there was high probability of use of VCP if the desired state was not achieved. The findings of this study demonstrated that those who use vaginal cleansing products have greater risk of having AVD. Also, those who use VCPs, use it on a daily basis. Furthermore, females in the reproductive age bracket tend to use VCPs based on vaginal odour. The use of VCPs is a public health concern as it affects the reproductive and sexual health and wellness of women and also makes women susceptible to reproductive tract infections.

6.2 RECOMMENDATIONS

1. Qualitative studies can be conducted to obtain in-depth information on perceptions, beliefs and attitudes regarding vaginal cleansing products among women.

2. Further studies can be conducted to assess susceptibility to vulvovaginal symptoms among women who use vaginal cleansing products (VCPs).

3. Further studies can also be conducted to establish the relationship between use of vaginal cleansing products and transmission of HIV infections from HIV-infected persons. According to the WHO multi-country study on vaginal practices, women's vaginal practices may increase their susceptibility to contracting STIs including HIV especially in heterosexual relationships. Vaginal practices have also been considered a risk factor for HIV transmission among heterosexuals according to the multi-country study (World Health, 2012).

4. The study can be repeated in different location settings with larger sample sizes as well as provision for participants to discuss how the products to further establish findings.

5. The Medical Director of the Tema General Hospital can support to staff at the obstetrics and gynaecology department to have regular talks at the OPD on feminine hygiene and vaginal cleansing products. This is based on the findings of this study which demonstrated that those who use vaginal cleansing products have greater risk of having AVD.
6. Mass media sensitization should be carried out to educate women on the proper use of VCPs and abnormal vaginal discharge.

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APPENDIX I

Respondent Information Sheet

General information

Project Title: Prevalence of use of vaginal cleansing products and its relationship with abnormal vaginal discharge among women aged 18-47 years in Tema

I am ……. (interviewer),

a student of the Department of Population, Family & Reproductive Health, University of Ghana Legon pursuing a Master of Public Health Degree Programme. I am here with my research assistants to carry out a survey to find out the use of vaginal cleansing products and its relationship with abnormal vaginal discharge among women aged 18-47 years in the Tema metropolis. This is purely for academic purposes and forms part of the requirement for the award of Master of Public Health Degree. The researcher has no conflict of interest in this study.

Procedure

The study will entail completing a questionnaire regarding vaginal cleansing products and its relationship with abnormal vaginal discharge. The information you provide will help advance knowledge and influence policy about vaginal cleansing products and propose some interventions if needs be.

Benefits and Risks

There will be no direct benefit to you from the study. Information gathered will help in policy making regarding vaginal cleansing products. There will be no monetary or material compensation for the study. Some questions are sensitive and embarrassing which constitute some form of risk. I am always available to assist with any questions.

Confidentiality

No name will be documented. Your identity and name are not required for the study. However, the information you will provide will be encrypted and regarded as strictly private. Complete confidentiality is guaranteed for the information you will provide. No one other than the researcher and supervisor of this study will have access to the information provided, in whole or in part. The collected data will be securely retained for a minimum of three years, after which they will be deleted.

Voluntary withdrawal

This study is entirely voluntary. You may respond to part or all of the questionnaire. You are free to withdraw from the research or terminate the interview at any point in time. You may also choose not to respond to any questions that make you feel uneasy. If you opt not to participate in the study, it will not have any effect on you or your hospital. However, you are encouraged to participate fully in this study to help safeguard vaginal health and promote appropriate vaginal health practices for women in the Tema Metropolis, Ghana and beyond.

Dissemination of results

At the conclusion of the study, findings and recommendations will be presented in a meeting with various stakeholders and made available at the School of Public Health.

Before Taking Consent

Do you have any questions you wish to ask about the study? Yes/No

If yes, please indicate the questions below

……
……

……
……

…….....
.....

If you have any question(s) or further clarification concerning this study and/or the conduct of the researcher and research assistants, please do not hesitate to contact the following;

Nana Afua Asiedu-Amponsah, School of Public Health, University of Ghana, Legon nasiedamp44@gmail.com. Tel: 0501106684; Prof Juliana Yartey Enos, Noguchi Memorial Institute for Medical Research (NMIMR), jenos@noguchi.ug.edu.gh ; Nana Abena Apatu, GHS ERC Administrator. Tel: 0503539896, ethics.research@ghsmail.org

CONSENT FORM

STUDY TITLE: USE OF VAGINAL CLEANSING PRODUCTS AND ITS RELATIONSHIP WITH ABNORMAL VAGINAL DISCHARGE AMONG WOMEN IN TEMA

PARTICIPANTS' STATEMENT

I acknowledge that I have read or have had the purpose and contents of the Participants' Information Sheet read and all questions satisfactorily explained to me in a language I understand (English, Asante Twi, Fante). I fully understand the contents and any potential implications as well as my right to change my mind (i.e., withdraw from the research) even after I have signed this form.

I voluntarily agree to be part of this research.

Name of Participant…….

Participants' Signature ……..OR Thumb Print……

Date:……

INTERPRETERS' STATEMENT

I interpreted the purpose and contents of the Participants' Information Sheet to the afore named participant to the best of my ability in the (……*name of language*) language to his proper understanding.

All questions, appropriate clarifications sort by the participant and answers were also duly interpreted to his/her satisfaction.

Name of Interpreter……

Signature of Interpreter…….. OR Thumb Print …….....

Date:…… Contact Details…….

STATEMENT OF WITNESS

I was present when the purpose and contents of the Participant Information Sheet was read and explained satisfactorily to the participant in the language he/she understood (….*name of language*)

I confirm that he/she was given the opportunity to ask questions/seek clarifications and same were duly answered to his/her satisfaction before voluntarily agreeing to be part of the research.

Name:……

Signature…….... OR Thumb Print …….....

Date:……

INVESTIGATOR STATEMENT AND SIGNATURE

I certify that the participant has been given ample time to read and learn about the study. All questions and clarifications raised by the participant have been addressed.

Researcher's name……

Signature ……

Date……

APPENDIX II: QUESTIONNAIRE

Title of Study

USE OF VAGINAL CLEANSING PRODUCTS AND ITS RELATIONSHIP WITH ABNORMAL VAGINAL DISCHARGE AMONG WOMEN IN TEMA

QUESTIONNAIRE

I am a post graduate student of the School of Public Health, University of Ghana and conducting research on the topic: Use of vaginal cleansing products and its relationship with abnormal vaginal discharge. The aim of this research is to determine the prevalence of vaginal cleansing products and its relationship with abnormal vaginal discharge. I would like to request your participation in this study. Participation in this study is **voluntary and withdrawal would not affect your health care**. The information that will be given shall be treated with confidentiality and for academic purposes. **Confidentiality of the answers given is assured**. The answers will be kept under lock and key and only used for the intended purpose. Thank you very much for your participation

SECTION A: SOCIO-DEMOGRAPHIC INFORMATION

1. Age

☐ 18 – 22 ☐ 33 - 37

☐ 23 - 27 ☐ 38 - 42

☐ 28 – 32 ☐ 43 – 47

2. Civil Status

☐ Single ☐ Married ☐ Divorced ☐ Widowed ☐ Co-habiting

3. Highest level of education attained

☐ JHS ☐ SHS ☐ Vocational/Technical ☐ 1st Degree ☐ Masters

☐ Postgraduate ☐ None

4. Religious group

☐ Christian ☐ Muslim ☐ Traditionalist ☐ Other please specify: ……

5. Occupation / Profession

☐ Professional/Technical/Managerial ☐ Sales & Services

☐ Clerical ☐ Skilled manual

☐ Unskilled manual ☐ Agriculture

☐ Other please specify:…….

6. Pregnancy status ☐ Pregnant ☐ Non-pregnant

SECTION B: FEMININE INTIMATE HYGIENE PRODUCTS

7. Are you aware of feminine hygiene products? ☐ Yes ☐ No

8. If 'Yes', what are feminine hygiene products?

……..

9. Which type of feminine hygiene product do you know of?

☐ Wipes e.g. compact wipes

☐ Sprays e.g. beauty formulars spray

☐ Feminine wash e.g. Lavet, Hilady, Lactacyd, etc.

☐ Other please specify: ……

10. How did you get to know of these intimate feminine hygiene products?

☐ Medical professional ☐ Friends/Family ☐ TV/Radio ☐ Social Media

☐ Internet ☐ Other specify: …….

11. Have you used any of the above-mentioned feminine hygiene products before?

☐ Yes ☐ No

If 'Yes' please answer the next questions

If 'No' please skip to SECTION C

12. Which of the following have you used?

☐ Lavet feminine wash

☐ Hilady feminine wash

☐ Duffys feminine kleanz

☐ Beauty formulas feminine spray

☐ O'Yes feminine wash

☐ Lactacyd feminine wash

☐ Femfresh

☐ Beauty formulas wash

☐ Compact wipes

☐ Others specify: ……

13. How long have you used the feminine hygiene product?

☐ Less than 6 months ☐ More than 6 months

14. Reasons for use. Tick all that apply.

☐ For daily cleansing

☐ Before and/or after sex for some reason

☐ Intermittent use during the day to feel fresh

☐ To get rid of vaginal odour

☐ To tighten vaginal muscles

☐ Before and/or after my period

☐ Other specify: ……

15. How often do you use the intimate feminine hygiene product? Tick one

☐ Daily ☐ Weekly ☐ Every two weeks ☐ Monthly ☐ Other …….

16. Have you combined any of the feminine hygiene products for use within the past 6 months?

☐ Yes Please specify :……☐ No

17. Have you experienced any adverse reactions to using feminine hygiene products?

☐ Yes ☐ No

If yes, please describe the adverse reaction …….

If 'Yes' Skip to question 18

If 'No' go to question 17

SECTION C: VAGINAL DISCHARGE

18. Have you experienced any abnormal vaginal discharge within the past six months?

☐ Yes ☐ No

19. How many times have you experienced vaginal discharge in the past six months? State ……

20. What was the colour of the discharge?

☐ Clear ☐ White ☐ Yellow ☐ Brown ☐ Other please specify: ……

21. What was the consistency of the vaginal discharge?

☐ Thick white ☐ Thin ☐ Mucoid ☐ Frothy ☐ Other please specify: …….

22. What was the odour of the vaginal discharge?

☐ Non-offensive ☐ Offensive ☐ Fishy ☐ Other please specify: ……

23. Have you experienced any of these symptoms while having abnormal vaginal discharge within the past three (3) months? Tick all that apply

☐ Itching and scratching in the genital area ☐ Burning sensation

☐ Redness of the vagina ☐ Lower abdominal pain

☐ Pain during sex ☐ Vaginal soreness

24. Are you sexually active? ☐ Yes ☐ No

25. Are you currently on any contraceptive method or therapy? ☐ Yes ☐ No

26. Do you travel on long journeys? ☐ Yes ☐ No

SECTION D: PERCEPTIONS ON VAGINAL CLEANSING PRODUCTS

27. Which one method is best for vaginal care when bathing?

☐ Do not wash the inside of the vagina at all

☐ Wash the inside of the vagina with water

☐ Use an intimate feminine wash

28. Do you think that the use of vaginal cleansing products prevents and treats vaginal infections?

☐ Yes ☐ No

29. Do you think that vaginal cleansing products are harmful?

☐ Yes ☐ No ☐ Maybe

APPENDIX III: ETHICAL APPROVAL

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

In case of reply the number and date of this Letter should be quoted.

My Ref. GHS/RDD/ERC/Admin/App/22/568
Your Ref. No.

Research & Development Division
Ghana Health Service
P. O. Box MB 190
Accra
Digital Address: GA-050-3303
Mob: +233-50-3539896
Tel: +233-302-681109
Email: ethics.research@ghs.gov.gh
15th December, 2022

Nana Afua Asiedu-Amponsah
P.O. Box CO 3011, Tema

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

GHS-ERC Number	**GHS-ERC: 018/10/22**
Study Title	Use of Vaginal Cleansing Products and Its Relationship with Abnormal Vaginal Discharge among Women in Tema
Approval Date	15th December, 2022
Expiry Date	14th December, 2023
GHS-ERC Decision	**Approved**

This approval requires the following from the Principal Investigator

- Submission of a yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months,
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report after completion of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.

You are kindly advised to adhere to the national guidelines or protocols on the prevention of COVID -19

Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....
Dr. Naa-Korkor Allotey
(Ag. Head, Ethics & Research Management Department)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra