KAIRUKI UNIVERSITY

DEPARTMENT OF OBSTETRIC AND GYNAECOLOGY

FACULTY OF MEDICINE

DEPARTMENT OF OBSTETRICS AND GYNECOLOGY

RESEARCH REPORT

TITLE: MAGNITUDE, ANTIMICROBIAL SUSCEPTIBILITY AND FACTORS ASSOCIATED WITH ABNORMAL VAGINAL DISCHARGE AMONG WOMEN OF REPRODUCTIVE AGE ATTENDING KAIRUKI HOSPITAL, DAR ES SALAAM.

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A Dissertation Report Submitted in (Partial) Fulfilment of the Requirements for the Degree Award of Master of Medicine in Obstetrics and Gynaecology at Kairuki University.

July 2025

CERTIFICATION

The undersigned certifies that they have read and hereby recommends for examination by the Kairuki University a dissertation entitled "Magnitude, Antimicrobial Susceptibility and Factors Associated with Abnormal Vaginal Discharge Among Women of Reproductive Age Attending Kairuki Hospital, Dar Es Salaam" in partial fulfilment of the requirements for the Degree Award of Master of Medicine in Obstetrics and Gynaecology of Kairuki University.

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Dr. MONICA CHIDUO

Date: _____

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Prof. RICHARD MWAISWELO

Date: _____

DECLARATION AND COPYRIGHT

I, Annuciatha Francis, declare that this dissertation entitled "Magnitude, antimicrobial susceptibility and factors associated with abnormal vaginal discharge among women of reproductive age attending Kairuki Hospital, Dar es Salaam" is my original work and it has not been presented and will not be presented to any other University for a similar or any other degree award.

Signature_____

Date_____

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DEDICATION

I dedicate this work to my parents, my congregation, and for the health of women in reproductive age.

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LIST OF ABBREVIATIONS

ACC	Amsel Clinical Criteria
AMR	Antimicrobial Resistance
ATCC	Stands For the American Type Culture Collection
AVD	Abnormal Vaginal Discharge
BV	Bacterial Vaginosis
CLSI	Clinical and Laboratory Standards Institute.
DNA	Deoxyribonucleic Acid
HIV	Human Immune Virus
KH	Kairuki Hospital
KU	Kairuki University
MHA	Muller Hinton Agar
OBS&GYN	Obstetrics and Gynecology
PID	Pelvic Inflammatory Diseases
SPSS	Statistical Package for The Social Sciences
STG	Standard Treatment Guidelines
STIs	Sexually Transmitted Infections
USA	United States of America
WHO	World Health Organization
aOR	Adjusted Odds Ratio
CI	Confidence Interval

ABSTRACT

Background: Abnormal vaginal discharge is a prevalent health concern among women of reproductive age and can result from various infectious and non-infectious conditions. Understanding its magnitude, causative pathogens, and antimicrobial resistance patterns is crucial for effective management and intervention.

Objectives: This study aims to determine the prevalence of abnormal vaginal discharge, assess antimicrobial susceptibility patterns of the causative pathogens, and identify associated factors among women of reproductive age attending Kairuki Hospital in Dar es Salaam between March and May 2025.

Methods: A hospital-based cross-sectional study was conducted, involving 311 participants. Data on socio-demographic characteristics, clinical presentations, and associated factors were collected through structured questionnaires, and clinical assessments. Laboratory investigations were performed to identify causative pathogens and their antimicrobial susceptibility profiles. Data analysis was conducted using IBM SPSS Version 22, applying both descriptive and inferential statistical methods.

Result: A total of 311 women of reproductive age participated, with a mean of 30.3 years. The majority were aged 20-29 years, unmarried, and self-employed. Abnormal vaginal discharge was reported in 63.6% of participants. The most frequently isolated bacteria were Staphylococcus aureus (45.2%), E. coli (25.1%) and coagulase- negative Staphylococci (23.7%).High antimicrobial sensitivity was observed with ciprofloxacin,cefoxitin,and gentamicin, whereas doxycycline and chloramphenicol showed the greatest resistance. Abnormal discharge was significantly associated with younger age, unmarried status, unemployment income,

pregnancy, and contraceptive use. No significant association was observed with education level, health insurance coverage, alcohol consumption, or smoking.

Conclusion and Recommendation: This study revealed a notably high prevalence (63.6%) of abnormal vaginal discharge among women of reproductive age, indicating that reproductive tract infections remain a significant public health concern. The predominance of Staphylococcus aureus and other opportunistic bacteria suggests possible lapses in personal hygiene, inappropriate antibiotic use, or changing sexual behaviors. The observed resistance to commonly used antibiotics such as doxycycline highlights emerging antimicrobial resistance within the community. The associations with younger age, unemployment, low income, and contraceptive use reflect the influence of socio-economic and behavioral factors on women's reproductive health. Overall, these findings underscore the need for enhanced preventive strategies, improved health education, and rational antibiotic use. The study recommends strengthen antimicrobial stewardship, enhance health education, Routine screening and further research.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Abnormal vaginal discharge is a common concern among many women of reproductive age and is often a significant condition presented at the gynaecology clinic. It is normal and healthy for women to have a certain amount of vaginal discharge, any changes in the colour, consistency, volume, or odour indicate health issues (1). The Amsel criteria are used to diagnose bacterial vaginosis, which includes evaluating vaginal acidity, the presence of discharge, the appearance of clue cells, and a positive "whiff test" (2). However, studies have shown that the most sensitive criteria for diagnosing bacterial vaginosis are the vaginal pH and the detection of thin, homogeneous, milky, and adherent discharge (3,4).

Conditions associated with abnormal vaginal discharge include Bacterial vaginosis 23%-29% Vaginal candidiasis 20%-25%, Trichomoniasis 15%-20%, and Cervicitis caused by gonorrhea or chlamydia which are both causing Sexually Transmitted Infections. Other factors are yeast infections, poor hygiene, hormonal changes, vaginal atrophy, allergic reactions to products, and the introduction of foreign objects that can cause abnormal vaginal discharge (5,6).

Symptoms of abnormal vaginal discharge includes changes in colour, consistency, odour, or amount of discharge, as well as accompanying symptoms like itching, irritation, pain during urination, intercourse, and redness or swelling of the vulva(7).

This condition can be managed by identifying and treating the underlying cause. For yeast infections, antifungal medications such as Clotrimazole or fluconazole are often prescribed(6). Bacterial vaginosis is usually treated with antibiotics like Metronidazole

or Clindamycin. STIs may require specific antibiotics or antiviral medications depending on the infection. Also, maintaining good hygiene, avoiding irritant products, and wearing breathable cotton underwear can help to prevent the recurrence. Consulting a healthcare provider for proper diagnosis and treatment is crucial for effectively managing abnormal vaginal discharge (5).

Infections causing abnormal vaginal discharge may require antimicrobial treatment for resolution. The effective management of these conditions relies on antimicrobial therapy.

Antimicrobial resistance is a growing global and local concern, posing significant challenges to effective treatment. A study in Uganda revealed that bacterial isolates, including *Staphylococcus aureus*, *Klebsiella pneumoniae*, and *Enterococcus faecalis*, were susceptible to Cefuroxime and Ciprofloxacin but resistant to Doxycycline and Azithromycin (8). Then, it highlights the necessity of regular surveillance and monitoring of susceptibility patterns to ensure effective treatment outcomes and to combat the emergence of resistant strains. Understanding the susceptibility patterns of causative organisms to antimicrobial agents is crucial for guiding appropriate therapy. This motivated the researcher to determine the magnitude, antimicrobial susceptibility, and factors associated with abnormal vaginal discharge among women of reproductive age attending Kairuki Hospital in Dar-es-Salaam.

1.2 Statement of the problem

Abnormal vaginal discharge remains one of the most frequent complaints among women attending obstetrics and gynaecology clinics, affecting approximately one in four women of reproductive age(9). In Tanzania, the standard Treatment Guidelines (STG) recommend syndromic management for sexually transmitted and reproductive tract infections, often without laboratory confirmation through culture and sensitivity testing. While this approach facilitates timely treatment, it may overlook the specific causative organisms and their antimicrobial resistance patterns. Despite adherence to the STGs, the prevalence of Vaginal infections remains high, with studies in Dar es salaam reporting over 65% of women affected by bacterial vaginosis, candidiasis, or trichomoniasis(10). Retrospective data from Kairuki Hospital (October 2023 – February 2024) also revealed a considerable burden of abnormal vaginal discharge cases, with recurrent infections suggesting possible antimicrobial resistance.However,limited data exist on the current magnitude of abnormal vaginal discharge, the specific bacterial pathogens involved, and their antimicrobial susceptibility patterns among women of reproductive age at Kairuki Hospital.Therefore,this study aims to determine the prevalnce,antimicrobial susceptibility patterns, and associated factors of abnormal vaginal discharge among women of reproductive age attending Kairuki Hospital in Dar es salaam.

1.3 Rationale of study

This study will provide updated evidence on the prevalence, etiological agents, and antimicrobial susceptibility patterns associated with abnormal vaginal discharge among women of reproductive age at Kairuki Hospital. The findings will enhance clinical decision making by guiding the selection of effective antimicrobial therapies and promoting rational antibiotic use. In addition, the results will contribute to reducing recurrent and resistant infections, thereby minimizing complications such as pelvic inflammatory disease, tubal infertility, ectopic pregnancy, and adverse pregnancy outcomes. The evidence generated will also inform hospital management and policymakers in developing context- specific interventions to improve diagnosis, treatment of reproductive tract infections. The study's findings will provide information on antimicrobial resistance at the hospital level. Moreover, the available data will inform decision-making among healthcare providers to improve the chance of recovery by lowering gynecologic complications, such as PID) with subsequent tubal factor, infertility, ectopic pregnancy, spontaneous abortions, pre-term delivery, low birth weight, and increased risk of post-operative infections.

By generating updated evidence on antimicrobial susceptibility and associated risk factors, this study will provide a foundation for more effective treatment strategies. This also will inform hospital management on initiating appropriate mechanisms for the diagnosis and treatment of AVD among women of reproductive age to prevent and control the occurrence of the disease.

1.4. Research questions

1.4.1 Overall research question

What is the magnitude, antimicrobial susceptibility, and factors associated with abnormal vaginal discharge among women of reproductive age attending Kairuki Hospital, Dar es Salaam?

1.4.2 Research questions

i. What is the magnitude of abnormal vaginal discharge among women of reproductive age attending Kairuki Hospital?
ii. What are the antimicrobial susceptibility patterns of bacterial isolates among women with abnormal vaginal discharge attending Kairuki Hospital?
iii. What are the factors associated with abnormal vaginal discharge among women of reproductive age attending Kairuki Hospital?

1.5. OBJECTIVES

1.5.1 Broad objective

To determine the magnitude, antimicrobial susceptibility, and factors associated with abnormal vaginal discharge among women of reproductive age attending Kairuki Hospital, Dar es Salaam.

1.5.2 Specific Objectives.

i. To determine the prevalence of abnormal vaginal discharge among women of reproductive age attending the Obstetrics and gynaecology Outpatient at Kairuki Hospital January to April

ii. To identify the bacterial pathogens isolated from women presenting with abnormal vaginal discharge and asses their antimicrobial susceptibility patterns.

iii. To determine the sociodemographic, behavioural, and clinical factors associated with abnormal vaginal discharge among women of reproductive age attending Kairuki Hospital.

1.6. Conceptual Framework

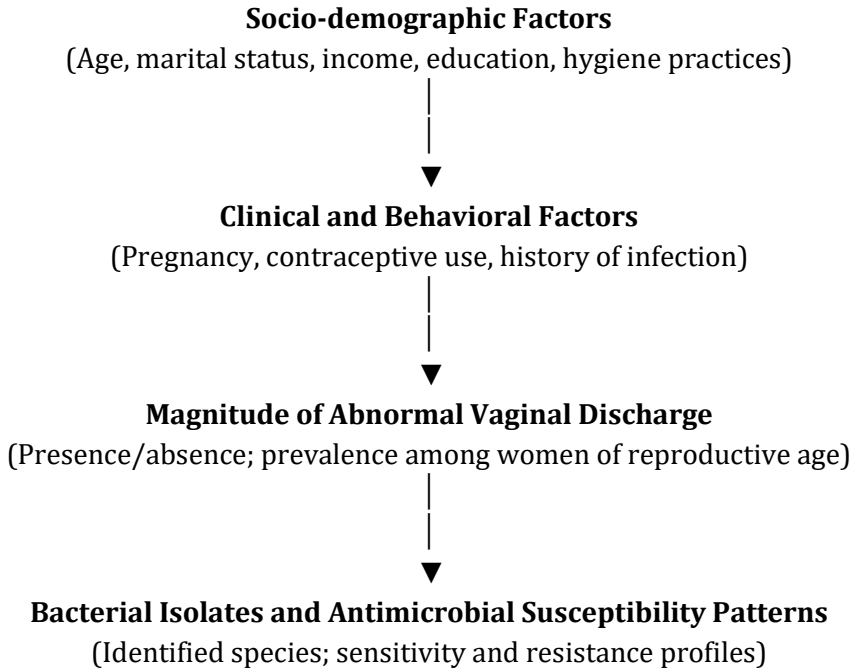

Figure 1: Conceptual Framework

1.6.1. Description of conceptual framework.

The conceptual framework aimed to demonstrate the relationship between the dependent and independent variables. These variables aimed to determine the magnitude, antimicrobial susceptibility, and factors associated with abnormal vaginal discharge among women of reproductive age attending KH, Dar es Salaam.

The dependent variable will be described with the abnormal vaginal discharge. This study described the existence of vaginal discharge despite available standard guidelines for treatment.

The magnitude of vaginal discharge may still be prevalent due to various risk factors. To explain that risk factors of abnormal vaginal discharge, and antimicrobial susceptibility patterns have been included as independent variables. This includes

socio-economic factors: sexual behaviour, age, occupation, residence, marital status, income, education level, and hygiene practice. Clinical factors: Infection, hormonal changes, cervical/vaginal condition, vaginal trauma or irritation, contraceptive use, menstrual disorder, comorbidity, etc.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Magnitude of abnormal vaginal discharge

The magnitude of abnormal vaginal discharge varies from one place to another due to different factors like geographical location, age, sexual activity, and other factors. Bacterial vaginosis is the prevalent etiological factor for vaginal discharge among women(11). For that reason, it has been estimated that more than 50% of women of either vaginal infection or vulva itching, while 90% of symptomatic women have abnormal vaginal discharge (12). In sub-Saharan Africa, young women have the highest (HIV) infection rates, a syndromic approach has been used since 1984 to treat abnormal vaginal discharge in areas with a high prevalence of STIs and bacterial vaginosis (13).

A study done by (14) In India, the pathology of vaginal discharge among pregnant women revealed that about 58% of prime gravida and 42% of multigravida had vaginal discharge (14). Furthermore, the finding of the study shows 70% of women presenting with vaginal discharge were asymptomatic, whereas 30% displayed symptoms. Another study conducted in a tertiary hospital Bihar in India, by (15), reported that 48.05% of pregnant women had vaginal discharge. When cultured, 37.5% had vaginal candidiasis, followed by 15% with aerobic vaginitis, 13.0% of trichomoniasis, and 8.5% of bacterial vaginosis (15). Besides the vaginal discharge is more prevalent in young women, the findings of these studies emphasized the necessity of early identification, appropriate treatment, and prevention of complications, along with guidance regarding proper hygiene practices.

A study from the Department of Obstetrics and Gynaecology at Umm A-Quara University in Egypt reveals that 73.9% of women who attended the clinic experienced abnormal vaginal discharge, highlighting the need for appropriate interventions to reduce the prevalence of gynaecological issues among women seeking medical care in the region (16). However, the study did not specify the causes of abnormal vaginal discharge, such as infections, hormonal imbalances, or lifestyle factors. Moreover, the study's findings explained that the discharge character among study participants was odourless by 72.1%, white translucence by 41.9%, abnormal secretion due to infection by 26.1%, and 24.7% due to fungal infection. The higher prevalence might be due to difficulty in differentiating between normal and abnormal vaginal discharge(17). This difficulty comes from an inadequate understanding of causes, cultural influences, beliefs, financial instability, fear of talking about it, and insufficient support (18).

In Nigeria, over 55.6% of women who sought healthcare experienced an abnormal vaginal discharge with 73.3% having been affected during pregnancy. *Candida albicans* was the most commonly isolated pathogen by 63.3%, whereby 76.3% experienced whitish vaginal discharge and 49.6% had foul-smelling discharges resembling fish odour. (19). In Tanzania, studies information is scarce regarding the magnitude of abnormal vaginal discharge. Although a study conducted by (20) at Muhimbili National Hospital demonstrated that 26.7% of pregnant women had bacterial vaginosis. (20). The study highlights the need of understanding the magnitude of abnormal vaginal discharge since it can be overlooked or underreported.

2.2 Antimicrobial susceptibility with abnormal vaginal discharge

According to the World Health Organization (WHO), identified antimicrobial susceptibility to vaginal discharge requires an effective management of reproductive health. Antimicrobial resistance (AMR) poses a significant challenge in treatments because pathogens develop resistance to commonly used antibiotics (21). This signifies the need for employing appropriate diagnosis and treatment protocols to prevent the spread of antimicrobial resistance. Moreover, promoting access to affordable and quality-assured antimicrobials while ensuring their rational use is crucial. Alongside this, enhancing surveillance systems to monitor antimicrobial resistance trends in vaginal infections is necessary for informed decision-making in healthcare practices. (22,23)

The recurrence of related bacterial vaginosis (BV) and the reduced effectiveness of antibiotics against related microorganisms when forming strong biofilms. A study conducted by (24) reported that Clindamycin seems to be a preferable option for treating G. *vaginalis* compared to Metronidazole. This preference arises from its higher susceptibility and lower resistance rate. Notably, clindamycin exhibited a mean minimum inhibitory concentration (MIC) of 0.099 ± 0.041 µg/mL as compared to 28.4 ± 6.50 µg/mL of metronidazole against biofilm formation (24). The biofilms make it difficult to eliminate the bacteria, making treatment more challenging. Another study from Iran on antibiotic susceptibility and pattern of bacterial vaginosis found that *E. coli, Staphylococcus spp., Enterobacter spp., E. faecalis, and R. ornithinolytica* isolates were resistant to several antibiotics. For instance, Ampicillin, Cefazolin, and Trimethoprim/Sulfamethoxazole were reported to be resistant to *E. coli* (25)

A retrospective study conducted in Poland shows that Streptococcus agalactiae was highly resistant to clindamycin and erythromycin but susceptible to penicillin and trimethoprim/ sulfamethoxazole. Notably, this was due to the availability of 38.6% of stain from Macrolide-lacosamide-streptogramin B. (26). The prevalence of yeast-like organisms is likely tied to recurrent infections; however, the diagnosis was solely based on Amsel criteria and culture methods, without employing preparations or microbiological Nugent criteria. In Uganda, the Kirby-Bauer disc diffusion method was used for testing the susceptibility of cultured bacterial isolates. The study identified, *Staphylococcus aureus, Klebsiella pneumoniae, and Enterococcus faecalis* as the prevalent isolated bacteria. Furthermore, the study observed, that 86.0% of Doxycycline and 67.0% of Azithromycin were resistant as compared to 90.7% of Cefuroxime and 81.3% of Ciprofloxacin. (8). Routine culture and susceptibility testing for women with abnormal vaginal discharge is essential to guide treatment, minimize inappropriate antibiotic use, and reduce antibiotic resistance.

In Tanzania, there is a scarcity of information. However, a study conducted by (20) at Muhimbili National Hospital bacterial vaginosis was the prevalent microorganism among pregnant women, (20). This signally little is known regarding antimicrobial susceptibility among pregnant women with vaginal discharge. Then, this highlights the need of understanding antimicrobial susceptibility, Therefore this study will be conducted to full fill the gap of determining the antimicrobial susceptibility among women attending the KH obstetrics and gynaecology clinic.

2.3 Factors associated with abnormal vaginal.

World Health Organization insisted on the need to understand risk factors, behaviour, or practices associated with abnormal vaginal discharge in women of reproductive age. (21). These factors include infections, hormonal fluctuations, medication use, and poor hygiene practices. Recognizing these risk factors enables healthcare providers to implement appropriate diagnostic and treatment strategies, ultimately promoting women's reproductive health worldwide.

Sexually transmitted infections like gonorrhoea, chlamydia, trichomoniasis, and genital herpes can be mainly associated with changes in vaginal discharge. Evidence from a study done in Nigeria shows sexually active women were more associated with the chance of experiencing abnormal vaginal discharge, compared to those who are not sexually active (27). Also, having unprotected sexual activity increases the risk of contracting STIs. This can be seen from a study done by (20) whereby the development of bacterial vaginosis was mostly associated with women who have previously had sexually transmitted infections (20). For that reason, BV occurs due to an imbalance of bacteria in the vagina, often resulting in a thin, greyish-white discharge with a fishy odour (25).

The higher prevalence presents a significant challenge in the management of Candida species. In Vietnam, over half 51.37% of symptomatic non-pregnant women of reproductive age were found to be colonized by the common vaginal yeast, *C.albicans* (28).The overgrowth of Candida fungus in the vaginal can lead to a thick, white, cottage cheese-like discharge. In Namibia, 43% of women with vaginal discharge were found to harbour Candida species, with a higher prevalence of 36% for *Candida albicans* compared to 9.5% for non-albicans Candida (29).

Inappropriate use of antibiotics, weak~~ened~~ immune system, pregnancy, and uncontrolled diabetes are the factors for an increased risk of developing yeast infections (29,30). The use of antibiotics, corticosteroids, and immune suppressants, can disrupt the normal balance of vaginal flora, leading to infections like yeast infections or BV (30).

Moreover**,** fluctuations in hormone levels, such as those occurring during pregnancy, menopause, or while using hormonal contraceptives, can lead to changes in vaginal flora In addition, the uses of hormonal contraceptives could potentially change the temporal patterns of the vaginal microbial and reduce the levels of Lactobacillus, varying based on the hormonal composition (31). These findings imply that ovarian hormones have the potential to influence the composition and stability of vaginal microbial communities, potentially impacting both vaginal and reproductive health (26)

Furthermore, improper hygiene practice was another risk factor for the occurrence of vaginal discharge**.** Douching and using tough soaps or scented products in the genital area, can disrupt the natural balance of vaginal flora (32). Similar study done by (33), in 2024 demonstrates that vaginal douching disrupts the vaginal microbiome, leading to bacterial vaginosis and yeast by upsetting the natural bacterial balance crucial for vaginal health (34). Also, genital hygiene is mostly affected by educational status, employment status, age status and marriage year affected genital hygiene behaviour (35).

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study design

This was a hospital-based, cross-sectional study aimed at assessing the magnitude of abnormal vaginal discharge, antimicrobial susceptibility, and the associated factors among women of reproductive age who attended the obstetrics and gynaecology clinic at Kairuki Hospital in Dar es Salaam from March to May 2025.

3.2 Study setting

This study was carried out at Kairuki Hospital, located in Kinondoni Municipal in Dar es Salaam. The Dar es Salaam region has a total population of 8,561,520 (36). KH was selected because it was a zonal-level facility that provided healthcare services to both inpatients and outpatients. Moreover, the hospital had a capacity of 150 beds and attended to approximately 600 outpatients per day. The hospital also serves as the teaching hospital for Kairuki University, offering high-quality health services through qualified healthcare personnel (37).

The Department of Obstetrics and Gynaecology was selected as the study setting since it was one of the largest clinical departments. Out of 600 OPD patients, 200 to 250 presented with obstetric and gynaecological issues. The department has two wards, including ward four, which was designed to meet patients' needs for convenience, privacy, and personalized care. The maternity unit is staffed by highly qualified healthcare providers offering obstetric care, including consultants, specialists, residents, registrars, nurse officers, and nurse midwives.

3.3 Study population

The study targeted to all women of reproductive age.

3.4 Sampling size.

The minimum sample size for this study was calculated using Kish and Leslie (1965) formula for estimating a single population proportion, as the study aimed to determine the prevalence of abnormal vaginal discharge among women of reproductive age. The formula is expressed as:

$$\mathbf{n} = \frac{z^2(pq)}{d^2}$$

Whereby

n=minimum sample size required

d=margin of error set at 5%

z=1.96(for 95% confidence interval)

p= proportion of women with abnormal vaginal discharge was 75.6% in a study conducted at Imo State University Teaching Hospital, Nigeria (19).

Due to the limited availability of recent data from Tanzania, the prevalence (p=0.756) was adopted from a study conducted at Imo State University Teaching Hospital, Nigeria where 75.6% of women presented with abnormal vaginal discharge. Nigeria was selected as a comparable setting within sub-Saharan Africa, sharing similar reproductive health and sociodemographic characteristics with the Tanzanian population.

Then,

$$\mathbf{n} = \frac{1.96^2 * 0.756(1 - 0.756)}{0.05^2}$$

The minimum sample size required is 283 women who seek obstetrics and gynaecology care.

To account for possible non- response and incomplete data, a 10% adjustment was added, resulting in an adjusted sample size. Thus, the final sample size was set 311 women attending the obstetrics and Gynaecology Outpatient Department at Kairuki Hospital.

A systematic random sampling technique was employed to recruit participants who met the inclusion criteria during the study period.

3.5 Sampling procedure

A sampling frame containing details of women of reproductive age (15 to 49 years) who attended the obstetrics and gynaecology clinic on a particular day was obtained from the nurses at the registry desk to facilitate the selection of study participants. To ensure an unbiased selection and enhance representativeness, a simple random sampling method was employed. This method was chosen because it gave each eligible participant an equal chance of being selected, minimizing selection bias and improving the generalizability of the findings.

A lottery system was used, where each eligible participant was asked to draw a piece of paper from a box containing randomly mixed numbers. Women who drew an even number (such as 2, 4, 6, etc.) were selected to participate in the study until the required sample size of 311 was achieved. This method was preferred as it was straightforward, eliminated researcher influence in participant selection, and ensured randomness in the sampling process.

To maintain accuracy and prevent redundancy, the card numbers of selected participants were recorded and coded after data collection. Participants were enrolled at a rate of six per day, five days a week, over a period of three months. The sample collection took place in the consultation room, whereby screens were

placed, curtains and door remained closed to prevent unauthorized person to enter in. Data obtained were accessed only by researchers to keep confidentiality. The Amsel clinical criteria were used to identify abnormal vaginal discharge.

3.5.1 Inclusion criteria

The study included:

i. All women of reproductive age who seek treatment at the obstetrics and gynaecology clinic at KH.
ii. All women who consented to participate in the process of data collection.

3.5.2 Exclusion criteria

The study excluded all women with the following criteria.

i. Reproductive-age women who have taken antibiotics within seven days before data collection.
ii. Women diagnosed with genital malignancy.
iii. All women in menstrual bleeding during the data collection
iv. Women of reproductive age who refused to sign the consent form.

3.6. Data collection

3.6.1 Data Collection Methods for Each Specific Objective

3.6.1.1 To determine the magnitude of abnormal vaginal discharge:

A hospital-based cross-sectional study was conducted. Eligible women seeking care at the hospital were recruited based on predefined inclusion criteria. The prevalence was calculated as the proportion of affected women among the total number of participants.

3.6.1.2 Antimicrobial susceptibility patterns of the identified bacterial isolates:

High vaginal swabs were collected from participants presenting with abnormal vaginal discharge. Laboratory investigations, including Gram staining, culture, and biochemical tests, were performed to identify bacterial pathogens. Antimicrobial susceptibility testing was conducted using the Kirby-Bauer disk diffusion method following Clinical and Laboratory Standards Institute (CLSI) guidelines. Results were analysed to determine resistance patterns to commonly prescribed antibiotics.

3.6.1.3 To evaluate the factors associated with abnormal vaginal discharge among women of reproductive age:

Structured questionnaires were administered to collect data on socio-demographic factors, behavioural practices, medical history, and hygiene practices. Clinical assessments and laboratory findings were also considered. Statistical analysis was conducted using logistic regression to identify significant associations between risk factors and abnormal vaginal discharge.

3.7. Data collection procedure

Before data collection began, patients were visited in the waiting area by the researcher after being registered at the hospital. The researcher provided detailed information regarding the study objectives and criteria for being included in the study.

The study involved the principal investigator, two senior residents in their 3rd year at KU, one clinical microbiologist, a lab scientist from Kairuki Hospital, and one qualified nurse working at the obstetrics & gynaecology clinic. The principal investigator conducted a one-day training for the research assistants about the study. The training included the principles of sample collection, proper filling of the tools,

selection of participants, as well as transporting the collected samples to the laboratory.

The principal investigator and two doctors collected the samples and filled out the questionnaire. A nurse assisted the doctors during sample collection in the consultation rooms, and the laboratory scientists were involved in conducting investigations like wet preparations, Gram stain, culture and sensitivity, and antimicrobial susceptibility. Collected samples were taken to the laboratory by a nurse within 30 minutes of data collection.

3.7.1: Sample collection

The sample was collected in the consultation rooms. Six sterile disposable Cusco's speculums and one box of sterile gloves were available in each consultation room each day of sample collection. Following aseptic precautions, the patient assumed the lithotomy position. The researcher and/or assistants used cotton swabs moistened with normal saline to swab the vulva. With one hand, they separated the patient's labia minora and majora, while gently introducing a sterile Cusco's speculum into the patient's vagina with the other hand to visualize the cervix.

Under direct visualization of the cervix with the speculum in place, the endocervix was swabbed using a sterile cotton swab. The swab was inserted 20–30 millimetres into the cervical canal and rotated gently through 360 degrees clockwise against the endocervical wall. Two swabs were collected with minimal interference: one for culture and sensitivity, and the other for gram stain.

For the vaginal specimen, sterile cotton swabs were inserted and rotated 360 degrees onto the posterior vaginal fornix under direct vision. Two swabs were

collected, one for wet preparation and gram stain, and the other for culture and sensitivity.

Each collected swab was placed back into its respective tube (Stuart transport media) and labelled with the participant's study number, initials, date, and time of collection. Afterward, the researcher conducted a bimanual examination on all patients as part of the routine gynaecological examination.

3.7.2 Sample transportation and handling

The transportation of the swabs to the medical microbiology laboratory of Kairuki Hospital was conducted by a trained nurse within 30 minutes of collection. The swabs were preserved in the Carry Blair transport medium within a cool box. The tubes were placed in a zip-top bag and transported in a cool box at 2–8°C to the laboratory in a cold box. Subsequently, the samples underwent the following upon arrival at the laboratory:

3.7.3 Wet Preparation

Samples from both the endocervical canal and vagina were individually mixed with sterile normal saline. A small amount of each mixture was then placed on separate slides using a sterile pipette. Subsequently, the slides were examined under a microscope with a 40 × 10 objective to identify any motile, spear-shaped flagellates of *Trichomonas vaginalis* and budding yeast cells. Moreover, an agent of bacterial vaginosis called *Gardnerella vaginalis* was diagnosed by the Whiff test and ×100 objective to identify Clue cells.

3.7.4 Gram Stain

Each participant's specimen slides underwent preparation, involving fixation, Gram-staining, and examination under oil immersion at ×100 to detect granulocytes, clue

cells (vaginal epithelial cells exhibiting a granular surface and blurred margins due to attached bacteria, indicative of bacterial vaginosis), and Gram-positive budding yeast cells. The frosted end of the slide was labelled with the patient number using a lead pencil. Subsequently, a cotton swab containing the specimen was evenly spread on the slide, covering a diameter of 15–20 mm, followed by air-drying and fixation with 2 drops of 50% acetone alcohol, allowing two minutes for the alcohol to dry. The fixed smear was then stained with crystal violet for 30–60 seconds, followed by washing with clean water and covering with Lugol's iodine for 30–60 seconds before washing off the iodine. Decolorization was performed rapidly using acetone-alcohol, followed by washing with clean water and staining with neutral red for 2 minutes. After washing off the stain, the slide was air-dried and examined under the microscope initially at ×40 magnification to assess staining and distribution of the smear material, and subsequently under an oil immersion objective to analyse bacteria and cells. Gram-positive bacteria and yeast cells appeared dark purple, whereas Gram-negative bacteria and pus cell nuclei appeared red.

3.7.5 Culture

Endocervical and vaginal samples for culture were inoculated onto 5% sheep blood agar, MacConkey agar, Mannitol salt agar, and modified Thayer Martin agar to isolate aerobic bacteria. The inoculated media underwent aerobic incubation at 37°C for 24 hours. Plates of modified Thayer Martin agar were subjected to incubation in a humidified atmosphere with 5% carbon dioxide. Identification of the cultured bacteria involved conventional phenotypic and biochemical methods, encompassing catalase, coagulase, and DNA-ase for *Staphylococcus aureus* (which yielded positive catalase, coagulase, and DNA-ase results), as well as urease, citrate utilization,

oxidase, and triple sugar iron tests for identifying and distinguishing Gram-negative bacilli.

3.7.6 Microbiological Identification of Bacterial Isolates

3.7.6.1 Specimen Collection & Initial Processing

High vaginal swabs were collected from participants presenting with abnormal vaginal discharge using sterile techniques. Swabs were inoculated onto Blood Agar, MacConkey Agar, and Chocolate Agar and incubated at 37°C for 24–48 hours under appropriate atmospheric conditions (aerobic/CO_2-enhanced for fastidious organisms).

3.7.6.2 Gram Staining & Preliminary Identification

Gram staining was performed to categorize bacteria as Gram-positive or Gram-negative and determine morphology (cocci, bacilli) and arrangement (clusters, chains). While Gram staining provided initial classification, further biochemical tests were conducted for definitive identification.

3.7.6.3 Biochemical Identification Tests

Depending on Gram reaction and morphology, the following tests **were used**:

For Gram-Positive Bacteria (e.g., Staphylococcus spp., Streptococcus spp.):

Catalase Test (Staphylococcus spp**.** were catalase-positive, while Streptococcus spp. was catalase-negative).

Coagulase Test (Staphylococcus aureus was coagulase-positive; CoNS—coagulase-negative

Staphylococci—were **coagulase-negative)**.

Bacitracin & Optochin Sensitivity (For differentiation of Streptococcus pyogenes and Streptococcus pneumoniae).

For Gram-Negative Bacteria (e.g., Escherichia coli, Klebsiella spp, and Pseudomonas spp.):

Oxidase Test (Pseudomonas spp. were oxidase-positive, Enterobacteriaceae were oxidase-negative). Triple Sugar Iron (TSI) Test (For lactose, glucose, sucrose fermentation, and hydrogen sulphide production).

Indole Test (E. coli was indole-positive, while Klebsiella pneumoniae was indole-negative). Urease Test (Klebsiella pneumoniae and Proteus spp. were urease-positive). Citrate Utilization Test (Klebsiella spp. were citrate-positive, while E. coli was citrate-negative)

3.7.7 Antimicrobial Susceptibility Test

AST was performed using the Kirby-Bauer disk diffusion method, following CLSI guidelines. The bacterial suspension (adjusted to 0.5 McFarland standard) was inoculated onto Mueller-Hinton Agar, and antibiotic disks were placed accordingly. After incubation at 37°C for 18–24 hours, zones of inhibition were measured using a calibrated ruler.

3.7.8 Procedure for Antibiotic Susceptibility Test

Using a sterile wire loop, colonies of pure bacterial growth were collected from the plate containing the cultured organism and suspended in 2mls of sterile peptone water to establish a suspension of 0.5 McFarland standard. Subsequently, a sterile cotton swab was submerged in the peptone water suspension containing the test

organism, and any excess peptone water was removed by gently pressing the cotton swab against the tube's wall above the suspension level. The cotton swab carrying the test organism was then utilized to uniformly inoculate the Mueller-Hinton agar plate, which had been dried for 15 minutes at 37°C in an incubator. The same protocol was repeated for the suspension of standard organisms, each time a sensitivity test was conducted. The standard organisms used for internal quality control included *S. aureus* ATCC 25923 for gram-positive bacteria and *E. coli* ATCC 25922 for gram-negative bacteria.

Subsequently, five antibiotic discs were positioned on the agar plate's surface using sterile forceps, ensuring a minimum distance of 2.5 cm between each disc. The culture plates then underwent aerobic incubation at 37°C for 24–48 hours. The diameters of the growth inhibition zones around each antibiotic disc were measured in millimetres using a ruler and compared with the growth inhibition zone diameters of the standard organism following the Clinical Laboratory Standards Institute – USA- 2020 guidelines.

3.7.9 Documentation of Microbiological Results for Publication

3.7.9.1 Gram Staining Images

Microscopic Images of Gram-Stained Smears

Microscopic images of Gram-stained smears were captured at 100x magnification using oil immersion and labelled with sample ID, magnification, and bacterial morphology.

Colony Morphology Documentation

High-resolution photographs of bacterial colony morphology on different culture media were taken under appropriate lighting conditions. Key characteristics (colour,

haemolysis, lactose fermentation on MacConkey, mucoid colonies, swarming, etc.) were described.

Biochemical Test Results

Results of catalase, coagulase, oxidase, TSI, indole, urease, and citrate were recorded in a tabular format with positive/negative reactions. Representative images of biochemical reactions (e.g., colour changes in TSI slants, urease test tubes) were captured.

Antimicrobial Susceptibility Testing (AST) Interpretation

Measured zones of inhibition (in mm) for each bacterial isolate were documented. A table of antibiotic susceptibility profiles (Sensitive, Intermediate, Resistant) was generated.

Representative images of disk diffusion plates with inhibition zones were captured and labelled.

Note: All the information included in pre-analytical, analytical, and post-analytical phases of the specimen obtained was recorded in the research-prepared book and retained in the research file prepared.

3.7.10 Variables

3.7.10.1: Independent variable

The study included the following variables

Independent Variables (Predictor Variables):

Socio-Demographic Factors:

I. Age
II. Marital status
III. Educational level

IV. Occupation

V. Income level

VI. Place of residence (urban/rural)

Behavioral and Hygiene Factors:

I. Frequency of vaginal douching

II. Type of undergarments (cotton/synthetic)

III. Personal hygiene practices

IV. Use of scented soaps or feminine hygiene products

V. Condom uses during sexual intercourse

VI. Number of sexual partners

VII. Frequency of sexual activity

Reproductive Health and Medical History:

I. History of previous vaginal infections

II. History of sexually transmitted infections (STIs)

III. Current or past use of antibiotics

IV. Use of hormonal contraceptives (Yes/No, type)

V. Pregnancy status (Pregnant/Non-pregnant)

VI. Menstrual cycle irregularities

VII. Presence of other gynecological symptoms (itching, burning sensation, lower abdominal pain)

VIII. Presence of comorbidities (e.g., diabetes mellitus, HIV status)

3.7.8.2 Dependent variable

I. Presence of abnormal vaginal discharge

II. Causative pathogens identified from laboratory investigations

3.8 Data analysis

Data were cleaned and entered a Statistical Package for the Social Sciences (SPSS) version 22 for analysis. Descriptive statistics of participant socio-demographic characteristics were summarized using mean, mode, and standard deviation for continuous variables. Categorical variables were assessed by using a chi-square and were presented by using frequency or percentage.

The Amsel Clinical Criteria (ACC) were employed to assess bacterial vaginosis. These criteria included a positive Whiff Test (fishy odour), vaginal pH >4.5, the presence of clue cells on microscopy, and thin homogeneous discharge (2). In this study, if the sample met at least three or more of these criteria, it was confirmed as abnormal vaginal discharge due to the presence of bacterial vaginosis.

The susceptibility patterns of bacteria were expressed as frequencies and percentages of the isolated antibiotics. The independent effect of each factor was determined using Binary logistic regression analysis. Each independent variable was subjected to a Univariate analysis, with those having a p-value of < 0.2 being included in the final multivariable model. For significant factors with a p-value of < 0.05 or equal, multivariate logistic regression was used to determine the risk factors associated with abnormal vaginal discharge**.**

3.9 Ethical consideration

This study adhered to the fundamental ethical principles governing research involving human participants: autonomy, beneficence, nonmaleficence, and justice.

3.9.1 Autonomy (Respect for Participants' Rights and Informed Consent)

Ethical clearance was obtained from the Institutional Ethical Review Board (IERB) of Kairuki University before commencing the study. Permission to conduct the study at

Kairuki Hospital was sought from the hospital director. Participants received clear and comprehensive information about the study, including its purpose, procedures, potential risks, and benefits. Participation was voluntary, and respondents had the right to withdraw at any stage without any consequences.

Informed consent was obtained through a written consent form, which participants had to sign before completing the questionnaire or providing biological samples.

3.9.2 Beneficence (Maximizing Benefits and Ensuring Well-being)

The study aimed to generate knowledge that would contribute to improving women's reproductive health outcomes, particularly regarding early diagnosis and appropriate treatment of abnormal vaginal discharge. Participants requiring treatment during the study period were provided with appropriate medical care to ensure their well-being. The study findings were shared with healthcare providers to support evidence-based interventions that could benefit future patients.

3.9.3 Privacy

Conducting clinical examinations behind screens and with closed doors to maintain confidentiality. Ensuring no unauthorized participant

3.9.4 Confidentiality

Efforts were made to prevent any form of harm to the participants. Also, questionnaires did not include participants' name. Data was securely stored and accessible only to authorized researchers**.**

3.9.4 Justice (Fair Selection and Equal Treatment of Participants)

Participants were selected fairly based on predefined eligibility criteria, without discrimination based on age, marital status, socioeconomic status, or ethnicity. The

study ensured that findings would benefit all women of reproductive age, not just a specific subgroup. No participant was denied necessary medical care, and those who required treatment during the study received appropriate clinical management**.**

3.10 Dissemination.

A research report will be submitted to the Head of the Department of Obstetrics and Gynaecology, Dean of the School of Medicine, Director of Postgraduate Studies and KH as part of the master's degree requirements. The report will also be published in a journal and KU repository.

CHAPTER FOUR

RESULTS

4.1 Sociodemographic, reproductive and behaviour characteristics of women of reproductive age

4.1.1 Sociodemographic characteristics of women of reproductive age.

This section presents the sociodemographic characteristics of women of reproductive age with abnormal vaginal discharge, aiming to understand the background characteristics that may describe the occurrence of genital tract infections in this group.

Table 1: Sociodemographic characteristics of women of reproductive age (n=311)

Variables		Frequency (n)	Percent (%)
Age group (in years)			
	15-19	3	1.0
	20-29	143	46.0
	30-39	130	42.0
	40-49	35	11.0
Marital status			
	Married	81	26.0
	Single	230	74.0
Education level			
	Primary and secondary	94	30.0
	College or vocational training	90	29.0
	Bachelor degree	127	41.0
Occupation			
	Employed	38	12.0
	Student	62	20.0
	Self employed	211	68.0
Residence			
	Outside Dar es salam	24	7.7
	Kinondoni	79	25.4
	Kigamboni	33	10.6
	Temeke	11	3.5
	Ubungo	103	33.2
	Ilala	61	19.6
Income level (in Tsh)			
	<350,000	117	37.6
	350,000-500,000	86	27.7
	>500,000	108	34.7
Insurance			
	No	61	19.6
	Yes	250	80.4

The result in table 1 above, indicated that participants had a mean age of 30.3 years and a standard deviation of 6.9 years. Most respondents (46.0%, n = 143) were aged between 20–29 years. Regarding marital status, most women (74.0%, n = 230) reported were single. In terms of education, the highest proportion had attained a bachelor's degree (41.0%, n = 127). A significant number of participants were self-employed (68.0%, n = 211), With respect to residence, the majority resided in Ubungo Municipality (33.2%, n = 103).

Income levels varied, but the most frequent income category was earning less than Tsh 350,000 per month (37.6%, n = 117). Health insurance coverage was relatively high, with (80.4%, n = 250) of participants insured.

4.1.2 Reproductive and behaviour characteristics of women of reproductive age

This section presents the reproductive and behavioural characteristics of women of reproductive age, aiming to describe the characteristics that may influence the risk of genital tract infections in this population

Table 2: Reproductive and Behaviour characteristics of women of reproductive age (n=311)

Variables		Frequency (n)	Percent (%)
Pregnancy			
	No	166	53.4
	Yes	145	46.6
Pre maturity history			
	No	250	80.4
	Yes	61	19.6
Miscarriage			
	No	211	67.8
	Yes	100	32.2
Pregnancy difficulties			
	No	266	85.5
	Yes	45	14.5
Contraceptive usage			
	No	275	88.4
	Yes	36	11.6
Smoking			
	No	275	88.4
	Yes	36	11.6
Alcohol consumption			
	No	196	63.0
	Yes	115	37.0

Result of table 2, regarding reproductive history, shows more than half (53.4%, n = 166) were not pregnant at the time of the survey. Most respondents (80.4%, n = 250) had no history of preterm birth, and (67.8%, n = 211) had not experienced a miscarriage. Similarly, the majority (85.5%, n = 266) reported no history of pregnancy difficulties.

Contraceptive use was low, with only (11.6%, n = 36) using contraceptives. The same proportion (11.6%, n=36) reported smoking, Alcohol consumption was reported by 37.0% (n = 115), while the majority (63.0%, n = 196) did not consume alcohol.

4.2 Magnitude of abnormal vaginal discharge among women of reproductive age

This section presents the magnitude of abnormal vaginal discharge among women of reproductive age, aiming to determine the extent of the condition and its association with potential genital tract infections.

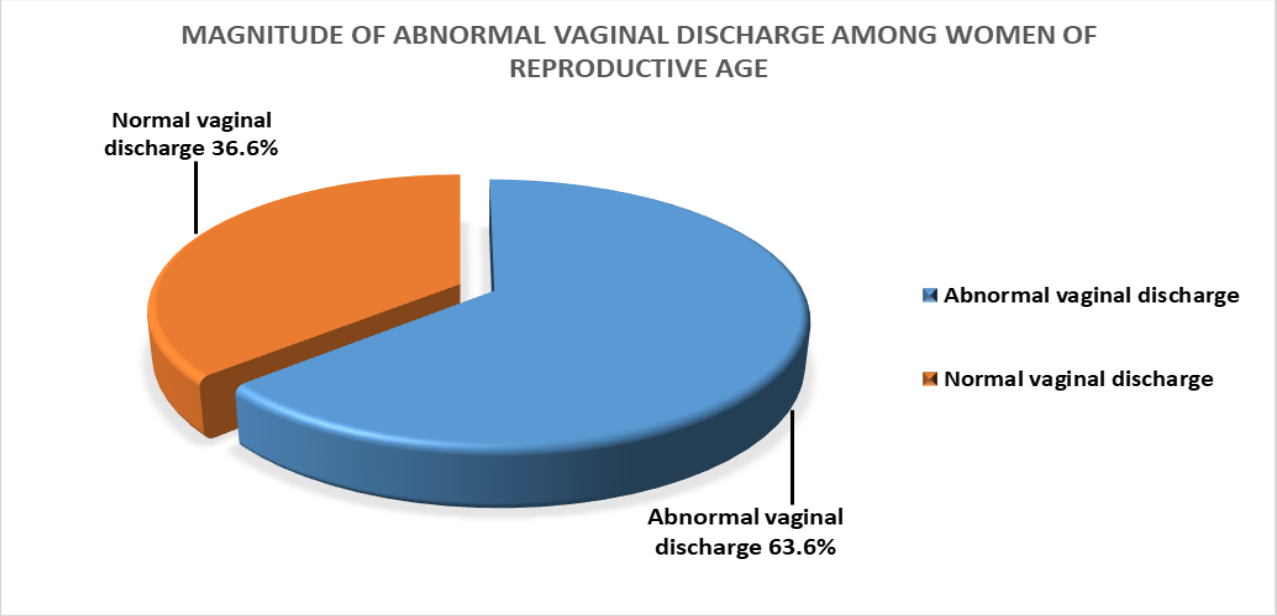

Figure 2: Magnitude of abnormal vaginal discharge among women of reproductive age attending Kairuki Hospital (n=311).

The figure 2 above shows, 311 women of reproductive age included in this study, (63.6%, n=198) were found to have abnormal vaginal discharge.

4.3 Antimicrobial susceptibility patterns of bacterial isolates among women with abnormal vaginal discharge.

4.3.1 Bacteria isolates among women with abnormal vaginal discharge

This section presents the distribution of bacterial isolates identified among women with abnormal vaginal discharge, aiming to determine the predominant organisms associated with genital tract infections in this group.

Table 3: Distribution of bacteria isolates in women with abnormal vaginal discharge (n=219)

Bacterial Isolate	Frequency (n)	Percent (%)
Escherichia coli	55	25.1%
Klebsiella spp	10	4.6%
Proteus spp	1	0.5%
Pseudomonas spp	2	0.9%
Staphylococcus aureus	99	45.2%
Staphylococcus spp (CONS)	52	23.7%
Total	**219**	**100%**

Result of table 3 above shows, 219 microbial isolates were obtained from 198 women of reproductive age presenting with abnormal vaginal discharge. Staphylococcus aureus was the most frequently identified organism, accounting for 45.2% (n=99) of all isolates. This was followed by *Staphylococcus coagulase-negative staphylococci (CONS)* at 23.7% (n=52) and *Escherichia coli* at 25.1% (n=55). Other isolates included Klebsiella species (4.6%, n=10), Pseudomonas species (0.9%, n=2), and Proteus species (0.5%, n=1) as shown in table 3 above.

4.3.2 Antimicrobial susceptibility patterns among women with abnormal vaginal discharge.

This section presents the antimicrobial susceptibility patterns among women with abnormal vaginal discharge, aiming to assess the effectiveness of commonly used antibiotics against the bacterial isolates identified in this group.

Table 4: Antimicrobial susceptibility patterns among women with abnormal vaginal discharge (n=219).

Antibiotics		Escherichia coli (n=55)	klebsiella spp (n=10)	proteus spp (n=2)	Pseudomonas spp (n=2)	Staphylococcus Aureus (n=99)	Staphylococcus CONS (n=52)	TOTAL (n=219)
Ampicillin 10µg	**S**	32	4	0	0	1	0	37
		58.2%	40.0%	0.0%	0.0%	1.0%	0.0%	16.9%
	I	6	3	0	0	0	0	9
		10.9%	30.0%	0.0%	0.0%	0.0%	0.0%	4.1%
	R	17	3	1	0	0	1	22
		30.9%	30.0%	100.0%	0.0%	0.0%	1.9%	10.0%
Ceftriaxone 30µg	**S**	21	4	0	0	1	0	26
		38.2%	40.0%	0.0%	0.0%	1.0%	0.0%	11.9%
	I	12	0	0	0	1	0	13
		21.8%	0.0%	0.0%	0.0%	1.0%	0.0%	5.9%
	R	22	6	1	0	1	0	30
		40.0%	60.0%	100.0%	0.0%	1.0%	0.0%	13.7%
Cefoxitin 30µg	**S**	40	3	0	0	33	17	93
		72.7%	30.0%	0.0%	0.0%	33.3%	32.7%	42.5%
	I	5	3	0	0	22	11	41
		9.1%	30.0%	0.0%	0.0%	22.2%	21.2%	18.7%
	R	10	4	1	0	42	24	81
		18.2%	40.0%	100.0%	0.0%	42.4%	46.2%	36.9%
Clindamycin 2µg	**S**	0	0	0	0	34	17	51
		0.0%	0.0%	0.0%	0.0%	34.3%	32.7%	23.3%
	I	0	0	0	0	22	11	33
		0.0%	0.0%	0.0%	0.0%	22.2%	21.2%	15.1%
	R	0	0	0	0	43	24	67
		0.0%	0.0%	0.0%	0.0%	43.4%	46.2%	30.6%
Doxycycline 30µg	**S**	11	0	0	0	15	11	37
		20.0%	0.0%	0.0%	0.0%	15.2%	21.2%	16.9%
	I	3	0	0	0	4	3	10
		5.5%	0.0%	0.0%	0.0%	4.0%	5.8%	4.6%
	R	41	10	1	2	80	35	169
		74.5%	100.0%	100.0%	100.0%	80.8%	67.3%	77.2%
azithromycin 15µg	**S**	0	0	0	0	35	17	52
		0.0%	0.0%	0.0%	0.0%	35.4%	32.7%	23.7%
	I	0	0	0	0	22	11	33
		0.0%	0.0%	0.0%	0.0%	22.2%	21.2%	15.1%
	R	0	0	0	0	42	24	66
		0.0%	0.0%	0.0%	0.0%	42.4%	46.2%	30.1%
Ciprofloxacin 5µg	**S**	35	8	0	2	47	34	126
		63.6%	80.0%	0.0%	100.0%	47.5%	65.4%	57.5%
	I	4	1	0	0	14	3	22

		7.3%	10.0%	0.0%	0.0%	14.1%	5.8%	10.0%
	R	16	1	1	0	38	15	71
		29.1%	10.0%	100.0%	0.0%	38.4%	28.8%	32.4%
Amoxillin-clavulanic acid	**S**	47	9	1	0	0	0	57
		85.5%	90.0%	100.0%	0.0%	0.0%	0.0%	26.0%
	I	5	1	0	0	0	0	6
		9.1%	10.0%	0.0%	0.0%	0.0%	0.0%	2.7%
	R	3	0	0	0	0	0	3
		5.5%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%
Erythromycin15µg	**S**	0	0	0	0	35	18	53
		0.0%	0.0%	0.0%	0.0%	35.4%	34.6%	24.2%
	I	0	0	0	0	22	11	33
		0.0%	0.0%	0.0%	0.0%	22.2%	21.2%	15.1%
	R	0	0	0	0	42	23	65
		0.0%	0.0%	0.0%	0.0%	42.4%	44.2%	29.7%
Piperacillin/ tazobactam	**S**	44	6	0	1	0	0	51
		80.0%	60.0%	0.0%	100.0%	0.0%	0.0%	23.3%
	R	11	4	1	0	0	0	16
		20.0%	40.0%	100.0%	0.0%	0.0%	0.0%	7.3%
Chloramphenicol 30µg	**S**	11	0	0	0	22	14	47
		20.0%	0.0%	0.0%	0.0%	22.2%	26.9%	21.5%
	I	3	0	0	0	4	3	10
		5.5%	0.0%	0.0%	0.0%	4.0%	5.8%	4.6%
	R	41	10	1	1	73	35	158
		74.5%	100.0%	100.0%	50.0%	73.7%	67.3%	73.5%
Gentamicin	**S**	22	7	0	2	34	20	85
		40.0%	70.0%	0.0%	100.0%	34.3%	38.5%	38.8%
	I	6	1	0	0	15	11	33
		10.9%	10.0%	0.0%	0.0%	15.2%	21.2%	15.1%
	R	27	2	1	0	50	21	101
		49.1%	20.0%	100.0%	0.0%	50.5%	40.4%	46.1%
Meropenem 10µg	**S**	44	6	0	1	0	0	51
		80.0%	60.0%	0.0%	50.0%	0.0%	0.0%	23.3%
	R	11	4	1	1	0	0	17
		20.0%	40.0%	100.0%	50.0%	0.0%	0.0%	7.8%

Table 4 above presented the analysis of antimicrobial susceptibility patterns among the isolates (n=219), The highest levels of resistance were observed with doxycycline (77.2%, n=169), chloramphenicol (73.5%, n=158), and gentamicin (46.1%, n=101).

Intermediate responses were most observed with cefoxitin (18.7%, n=41), clindamycin (15.1%, n=33), azithromycin (15.1%, n=33), erythromycin (15.1%, n=33), and gentamicin (15.1%, n=33).

In terms of susceptibility, the highest proportions of sensitivity were recorded with ciprofloxacin (57.5%, n=126), followed by cefoxitin (42.5%, n=93), gentamicin (38.8%, n=85), amoxicillin-clavulanic acid (26.0%, n=57), and azithromycin (23.7%, n=52) as shown in Table 4 above.

4.4 Factors associated with abnormal vaginal discharge among women of reproductive age

In this study several factors were significantly associated with abnormal vaginal discharge. Moreover, the determinants contributing to abnormal vaginal discharge among women of reproductive age.

Table 5: Factors associated with abnormal vaginal discharge among women of reproductive age (n=311).

Variable		cOR 95% CI; p-Value	aOR 95% CI; p-Value
Age			
	Less than 29 years	1.0(0.518-2.267),0.04	1.0(0.443-2.320**),0.00**
	30-39years	1.2(0.573-2.555),0.25	1.4(0.657-3.280),0.35
	40-49years	Ref	
Marital status			
	Not living with partner	1.7(1.027-2.921),0.03	1.8(1.082-3.113),**0.02**
	Living with partner	Ref	
Level of education			
	Lower level	1.4(0.923-2.304),0.11	1.4(0.912-2.295),0.12
	Higher level	Ref	
Occupation			
	unemployed	1.5(0.919-2.421),0.11	1.6(1.002-2.683),**0.04**
	employed	Ref	
Income level			
	Low income	1.6(0.983-2.827),0.06	1.9(1.111-3.470),**0.02**
	Middle income	1.6(0.910-2.853),0.10	1.9(1.040-3.476),**0.04**
	Higher income	Ref	
Insurance			
	No	1.2(0.662-2.050),0.59	1.2(0.666-2.129),0.55
	Yes	Ref	
Pregnancy			
	Yes	1.9(1.244-3.078),0.00	1.7(1.065-2.756),**0.03**
	No	Ref	
Contraceptive usage			
	Yes	2.4(1.115-5.166), 0.03	2.3(1.041-4.910),**0.04**
	No	Ref	
Smoking			
	Yes	1.1(0.535-2.154),0.04	1.1(0.519-2.209),**0.03**
	No	Ref	
Alcohol consumption			
	Yes	1.4(0.854-2.168),0.19	1.4(0.854-2.249),0.18
	No	Ref	

The result of the table 5 above shows, women at the age less than 29 years and not living with a partner were more likely to experience abnormal vaginal discharge compared to those living with a partner (aOR=1.0, 95% CI:0.443-2.320, p=0.00) and (aOR = 1.8, 95% CI: 1.082–3.113, p = 0.02) respectively.

Moreover, unemployed women had higher odds of abnormal discharge compared to employed women (aOR = 1.6, 95% CI: 1.002–2.683, p = 0.04). Similarly, income level was also a significant factor, with both lower-income (aOR = 1.9, 95% CI: 1.111–3.470, p = 0.02) and middle-income women (aOR = 1.9, 95% CI: 1.040–3.476, p = 0.04) more likely to report abnormal discharge compared to those with higher income.

Additionally, pregnancy was found to be a contributing factor (aOR = 1.7, 95% CI: 1.065–2.756, p = 0.03), as well as contraceptive use (aOR = 2.3, 95% CI: 1.041–4.910, p = 0.04).

In contrast, variables such as age, level of education, health insurance status, and alcohol consumption did not show statistically significant associations with abnormal vaginal discharge. Although smoking had a borderline p-value (p = 0.03), its odds ratio (aOR = 1.1) and wide confidence interval (0.519–2.209) suggest a weak and potentially inconclusive association.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.1 Discussion of the main finding

This study revealed that 63.6% of women of reproductive age experienced abnormal vaginal discharge, indicating a high prevalence of potential reproductive tract infections. The higher prevalence of abnormal vaginal discharge underscores the need for enhanced reproductive health education, and improved access to gynaecological care to address and manage underlying infections effectively. However, a lower prevalence rates were reported to be 39.5% in Ethiopia by (38), 48.05% in India by (15), the sub-Saharan region was up to 50% by (13), and 55.6% in Nigeria, by (19). The possible explanation was due to differences in population characteristics, healthcare access, or reporting practices.

This study revealed that *Staphylococcus aureus* was the most frequently isolated organism among women with abnormal vaginal discharge, followed by E. coli and coagulase-negative staphylococci (CoNS). These findings are consistent with similar studies conducted in various settings. For instance, a study conducted by (8) in Uganda revealed *Staphylococcus aureus* was the predominant pathogen of 48.6% among reproductive women who attended gynaecology clinic. Similarly, studies by (23) and (39) identified the commonly isolate of *S. aureus* were reported (24.2%) from India and (46.3%) respectively. Furthermore, (6), emphasized, predominance of *S. aureus* and CoNS reinforces the understanding that gram-positive cocci, particularly *Staphylococcus* species, as a common colonizers of the skin and mucous membranes.The possible explanation could be due to hormonal fluctuations, frequent medical interventions, and changes in the vaginal microenvironment may

predispose to colonization or infection by these organisms in women of reproductive age.

The findings of this study revealed that the highest levels of antimicrobial resistance among women with abnormal vaginal discharge were observed with Doxycycline. The results of our study finding was consistent with a study done by (8) in Uganda who reported Doxycycline (86.0%) and Azithromycin (67.0%) were the resistant antibiotics among the isolated bacterial in women of reproductive age. This was attributed to the frequent use of these antibiotics in treating abnormal vaginal discharge, and the widespread, unregulated access to these drugs over the counter. Such accessibility encourages self-medication and irrational use, contributing to the development of antimicrobial resistance due to genetic alterations and mutations that enhance bacterial survival against these drugs.

Furthermore, finding of the current study revealed that the highest bacterial sensitivity was observed with ciprofloxacin and cefoxitin. These findings suggest that these antibiotics remain relatively effective in treating infections among women of reproductive age with AVD. This was inconsistency with the findings from (23) in India, reported, Piperacillin Tazobactam, imipenem and meropenem demonstrate a high sensitivity against gram-negative bacterial isolates, particularly *E. coli* and *Klebsiella pneumoniae*. The variation in susceptibility rates could also be attributed to differences in regional antimicrobial stewardship practices, patterns of antibiotic usage, and the prevalence of resistant strains in specific settings.

The findings of this study revealed that women aged less than 29 years were more likely to experience abnormal vaginal discharge compared to those of older age. This association suggests that younger women of reproductive age may be more

vulnerable to infections or hormonal imbalances that contribute to abnormal discharge. The findings are consistent with a study done by (40) from Ethiopia reported women under the age of 30 had a higher prevalence of abnormal vaginal discharge. This was attributed with an increased sexual activity and limited awareness about reproductive hygiene. Similarly, (41) from India found that younger married women, at the age less than 18 years, were at higher risk of developing abnormal discharge, due to lower socioeconomic status and lack of access to reproductive health education.

The findings of this study revealed that women not living with a partner were significantly more likely to experience abnormal vaginal discharge compared to those living with a partner. This suggests that cohabitation or the presence of a stable partner may play a protective role in women's reproductive health, possibly due to, consistent sexual behaviour. The results of this study are consistent with findings from (42)in Uganda, which reported that unmarried or non-cohabiting women had a higher likelihood of experiencing reproductive tract infections due to increased exposure to multiple sexual partners. Similarly, (43) in India found that women lived with a partner who had history of reproductive tract infection were more vulnerable to poor reproductive health outcomes, including abnormal discharge and HIV.

The study revealed that unemployed women had significantly higher odds of experiencing abnormal vaginal discharge compared to employed women. This finding suggests that employment status may influence women's reproductive health, possibly through differences, in access to healthcare services, or health-seeking behaviour. However, the results contrast with findings from a study conducted in urban Uganda by (8) and Tanzania by (20), which found no significant

association between employment status and abnormal vaginal discharge. This discrepancy highlights the potential variability in contextual and environmental factors affecting women's reproductive health.

The study revealed that income level was a significant factor associated with the likelihood of reporting abnormal vaginal discharge among women of reproductive age. Specifically, women with lower income (aOR = 1.9, 95% CI: 1.111–3.470, p = 0.02) and those with middle income (aOR = 1.9, 95% CI: 1.040–3.476, p = 0.04) were more likely to report abnormal discharge compared to those with higher income. These findings are consistent with a study conducted in Ethiopia (44), which also identified low socioeconomic status as a significant predictor of abnormal vaginal discharge, attributing it to limited access to hygiene facilities and healthcare services. Similarly, a study in India by (45) found that women from lower-income households were more prone to reproductive tract infections due to poor living conditions and lack of health education. However, the findings contrast with those of a study conducted in Sweden by (46), where income level did not significantly influence the prevalence of abnormal vaginal discharge. The discrepancy may be explained by differences in healthcare infrastructure, social support systems, and public health awareness between high-income and low- to middle-income countries. It is possible that in high-income settings, universal access to healthcare mitigates the effects of income disparities on reproductive health outcomes. Therefore, the significant association between income level and abnormal discharge in this study highlights the importance of addressing socioeconomic inequalities to improve women's reproductive health, particularly in resource-limited settings.

The study revealed that pregnancy was significantly associated with the presence of abnormal vaginal discharge. This finding is supported by a study in India which found that hormonal and immunological changes during pregnancy, alongside increased vaginal secretions, contributed to a higher prevalence of abnormal discharge among pregnant women (15). Similarly, a study Ethiopia reported a greater occurrence of abnormal vaginal symptoms in pregnant women due to altered vaginal flora and increased susceptibility to infections, (40).

Contraceptive use was also found to be significantly associated with abnormal vaginal discharge. This is consistent with findings from Ethiopia, where women using hormonal contraceptives were more likely to report abnormal discharge, possibly due to hormonal changes that affect the vaginal ecosystem and increase the risk of infections, (47). In contrast, a study in India found no significant link between contraceptive use and abnormal discharge, suggesting that the relationship may vary depending on the type of contraceptive used. These findings underscore the importance of counselling women on reproductive health, and monitoring of symptoms while using contraceptives.

The study revealed that women who were taking medication had significantly higher odds of experiencing abnormal vaginal discharge, indicating a strong association between medication use and this condition. This finding aligns with similar study by (48) from India, reported that medication, particularly antibiotics and hormonal treatments, can disrupt the normal vaginal flora, thereby increasing the risk of abnormal discharge among reproductive-age women. However, this result contrasts with findings from a study in Ethiopia by (49), where no significant association was found between medication use and abnormal vaginal discharge, suggesting that

other factors such as hygiene practices and sexual behaviour might have a more prominent role in that population. The discrepancy between these studies highlights the possibility that the type of medication, duration of use, and population-specific factors such as genetics or healthcare access may influence the relationship between medication and abnormal discharge. Further research is therefore warranted to explore these contextual differences and to better understand the mechanisms underlying this association in diverse settings.

5.2 Limitations of the Study

This was a single centre study conducted at Kairuki Hospital, which may limit the generalizing of the findings to other populations or healthcare settings. In addition, the relatively small number of certain bacterial isolates restricted the depth of antimicrobial susceptibility analysis for some pathogens. Although efforts were` made to ensure accurate data colletion,minor recall bias may have occurred during interviews, as some participants found it difficult to recall past infections,treatments,,or related risk factors.Nonetheless,these limitations do not compromise the overall validity of the study findings, which provide valuable insight into the burden and antimicrobial resistance patterns associated with abnormal vaginal discharge among women of reproductive age. Single centre study design that limiting generalizability to broader population &

Limited number of certain bacteria isolates restricts comprehensive analysis.

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

6.1 Conclusion

The findings of this study indicate that abnormal vaginal discharge remains a significant reproductive health concern among women of reproductive age. The predominance of Staphylococcus aureus and the observed antimicrobial resistance patterns suggest that empirical treatment guided solely by syndromic management may be insufficient in addressing current infection dynamics. The associations between abnormal discharge and socioeconomic as well as reproductive factors underscore the complex interaction between biological, behavioural, and determinants of health.

These results emphasize the urgent need to strengthen laboratory-based diagnosis, promote rational antibiotic use through antimicrobial stewardship, and integrate targeted reproductive health education into routine care. Addressing both microbial resistance and the underlying social factors is essential for improving women's reproductive health outcomes and reducing recurrent or treatment- resistant infections.

6.2 Recommendation

Based on the findings of this study, the following could be recommended.

i. To encourage the use of rational antibiotics
ii. Targeted Health Education and Counselling in high-risk group like younger aged women.

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APPENDICES

APPENDIX 1: INFORMED CONSENT (ENGLISH VERSION)

STUDY TITLE: MAGNITUDE OF ABNORMAL VAGINAL DISCHARGE ANTIMICROBIAL SUSCEPTIBILITY AND ASSOCIATED FACTORS AMONG WOMEN OF REPRODUCTIVE AGE ATTENDING KAIRUKI HOSPITAL FROM JANUARY 2025 TO MARCH 2025.

INTRODUCTION:

Greetings, I am Dr Annuciatha Francis a postgraduate Student in 3rd year undertaking Obstetrics and gynecology at Kairuki University (KU), Currently I am conducting a study with the title: Magnitude of abnormal vaginal discharge, antimicrobial Susceptibility and associated factors among women of reproductive age attending Kairuki hospital, From January 2025 to April 2025, as a part of my study requirements.

I hereby request your participation and support in my study once my research assistants approach you. Our discussion will be confidential.

Your choice to participate or not will not affect your care and management.

Aim of the study: The purpose of this study is to determine the Magnitude of abnormal Vaginal discharge, antimicrobial susceptibility, and associated factors, among women of reproductive age attending Kairuki Hospital, from January 2025 to April 2025.

The benefit of the Study: The result findings will provide information on antimicrobial resistance, at the hospital level, moreover, available data will inform the healthcare providers regarding the decision-making on management to improve the chance of recovery and lower gynaecological complications

Risks: No risk in performing the procedure.

Who will be involved in this study?

This Study will involve, Two Medical Doctors and the principal investigator asking structured questions to you, and filling in the responses in the prepared questionnaire, two Laboratory scientists will be involved in conducting investigations, and one nurse for triage. Other information will be gathered through clinical examination. Management will be prescribed for those who will need it after the results of the investigations.

Consent: Your consent to be enrolled in the study is entirely voluntary and amenable by signing the consent form. You are free to consent or not, this will not affect the care and management offered.

You may decide to stop participating in this study at any time for any reason.

Confidentiality: The information you provide is extremely respected and will be preserved strictly confidential. The study information will be stored in protected computer files, and paper records will be stored in locked filing cabinets. Only study staff will have access to the information.

Access to Information: By signing this form, you allow the research team to use the information obtained and to give it to others who are involved in the research. The research team includes the researcher, facilitators plus others who participated in this study at Kairuki University.

Whom to Contact: In case of any queries about this study or further information or questions you can contact:

1. Director of research services

   Kairuki University,

   P.O BOX 65300

Dar es Salaam

2. The principal investigator

Dr. Annuciatha Francis

Obstetrics & Gynaecology Department,

Kairuki University,

P.O BOX 65300

Dar es Salaam, Tanzania

Tel 0756 640 264

3. SUPERVISOR:

Dr. Monica Chiduo

Senior Lecture & Head of Department

Department of Obstetrics and Gynaecology

P.O BOX 65300

Dar es Salaam, Tanzania.

Tel:0713618847

I……., have read/ told the contents of this form, my questions have been answered. I agreed to participate in this study.

Signature of participant……

Date of Signed consent …….

APPENDIX 2 : CONSENT FORM (SWAHILI VERSION)

Fomu ya ridhaa ya kushiriki katika utafiti

Utangulizi :

Jina langu ni **Dkt. Annuciatha Francis**, mwanafunzi wa udaktari bingwa wa magonjwa ya kizazi na uzazi kwa akina mama katika chuo kikuu cha Kairuki. Ninafanya utafiti juu ya **Kiwango, upinzani wa viumbe hai na mambo yanayohusiana na kutokwa na maji yasiyo ya kawaida katika uke miongoni mwa wanawake wa umri wa uzazi wanaohudhuria kliniki ya uzazi na magonjwa ya wanawake katika Hospital ya Kairuki, Dar es Salaam, kuanzia January mpaka April 2025**. Ninaomba ushiriki wako katika utafiti huu endapo mimi ama msaidizi wangu atakapokufuata ili kukuuliza taarifa muhimu kuhusu tatizo lako. Mjadala wetu utakuwa wa siri, uchaguzi wako wa kushiriki au la hautaadhiri matibabu yako.

Madhumuni ya utafiti:

Madhumuni ya utafiti huu ni kuamuaKiwango, upinzani wa viumbe hai na mambo yanayohusiana na kutokwa na maji yasiyo ya kawaida katika uke miongoni mwa wanawake wa umri wa uzazi wanaohudhuria kliniki ya uzazi na magonjwa ya wanawake katika Hospital ya Kairuki, Dar es Salaam

Hatari /Athari

Hakuna athari **/** madhara yatakayotokea au itokanayo kwa kushiriki utafiti huu

Faida za utafiti:

Ushiriki wako ama Ridhaa ya mgonjwa wako kushiriki katika utafiti huu, utawezesha kujua muundo na matibabu wa Kiwango, upinzani wa viumbe hai na mambo

yanayohusiana na kutokwa na maji yasiyo ya kawaida katika uke miongoni mwa wanawake wa umri wa uzazi wanaohudhuria kliniki ya uzazi na magonjwa ya wanawake katika Hospital ya Kairuki, pia data itayopatikana itawajulisha watoa huduma za afya kuhusu kufanya maamuzi kuhusu kuboresha nafasi ya kupona na kupunguza matatizo ya uzazi

Haki ya kutoshiriki

Ni hiari kushiriki katika utafiti huu utafiti na unaruhusiwa pia kujitoa, hakuna madhara yoyote utapata huduma bila kikwazo chochote.

Usiri: Taarifa zote zitakazokusanywa katika utafiti huu zitakuwa siri, hivyo ushiriki wako hautajulikana na mtu asiye husika na utafiti bali timu ya watafiti tu.

Malipo:

Kwa kushiriki kwenye utafiti huu, hautalipwa wala hautalipa gharama yoyote.

Ukiwa na swali au tatizo lolote, unaweza kuwasiliana na wafuatao:

1. Director of research services

   Kairuki University,

   P.O BOX 65300

   Dar es Salaam

2. The principal investigator

   Dr. Annunciata Francis

   Obstetrics &Gynaecology Department,

   Kairuki University,

   P.O BOX 65300

   Dar es salaam, Tanzania

   Tel 0756 640 264

3. SUPERVISOR:

Dr. Monica Chiduo

Senior Lecture & Head of Department

Department of Obstetrics and Gynaecology

P.O BOX 65300

Dar es Salaam, Tanzania.

Tel:071361884

Kuweka sahihi ya makubaliano :

Mimi, _____, nimesoma/nimesomewa maelezo yote yaliyomo kwenye fomu hii na nimeelewa. Maswali yangu yamejibiwa vizuri na niko tayari kushiriki.

Sahihi ya mshiriki _____

APPENDIX 3: DATA COLLECTION TOOL

Title: Magnitude of abnormal vaginal discharge antimicrobial susceptibility, and factors associated with abnormal vaginal discharge among women of reproductive age attending Kairuki Hospital, From January 2025 to March 2025.

Date: _____ NO _____

1. Section A: Socio-demographic and general characteristics of women of reproductive age attending the obstetrics and gynecology clinic.

i. Age: _____

ii. Marital Status:

1. Married a) Living with partner
   b) Not living with a partner
2. Single
3. Divorced
4. Widowed

iii. What is the highest level of education you have completed?

1. Primary school & formal education
2. Secondary school
3. College
4. Bachelor's degree &above

iv. What is your current employment status?

1. Employed
2. Self-employed
3. Student

4. Housewife
5. Unemployed

v. What type of area do you reside in within Dar es Salaam?

1. Ilala
2. Ubungo
3. Temeke
4. Kigamboni
5. Kinondoni
6. Others

Vi. What is your monthly household income?

1. below 350,000
2. 350 -500,000
3. More than 500,000.

vi. Do you have health insurance coverage?

1. Yes
2. No

2. Reproductive History:

vii. How many pregnancies have you had?

1. None
2. 1
3. 2 or more

viii. How many live births have you had?

1. None
2. 1

3. 2 or more

ix. Have you had an abortion or stillbirth?

1. Yes (*If yes, please specify* :)

Type	**Number**
1. miscarriage (s)	
2. abortion (s)	
3 Stillbirth	

2. No

x. Are you currently pregnant?

1. Yes, if yes GA?
2. No

xi. Are you currently using any form of contraception?

1. Yes
2. No

xii. If yes, what method(s) are you using? (Check all that apply)

1. Birth control pills
2. Condoms
3. Intrauterine device (IUD)
4. Birth control implant
5. Depo-Provera injection
6. Tubal ligation
7. Other (please specify) _____

3. Medical History:

xiii. Do you have any chronic medical conditions?

1. Yes
2. No

If, "Yes" select the medical condition

3. Diabetes mellitus
4. Cancer (**specify type if known**, e.g., breast cancer, cervical cancer, others_____)
5. HIV/AIDS
6. Others (specify) _____

xiv. Are you currently taking any medications?

1. Yes
2. No

If, "yes", please specify the medications you are taking

_____

4. Risk Factors and Lifestyle

xv. Do you have a history of sexually transmitted infections (STIs)?

1. Yes
2. No

xvi. How often do you practice vaginal douching?

1. Never
2. Occasionally
3. Frequently

xvii. Do you smoke tobacco products?

3. Yes, daily
4. Yes, occasionally
5. No, I used to but quit
6. No, never

xviii. How often do you consume alcohol?

7. Daily
8. Weekly
9. Monthly
10. Occasionally
11. Never

Section B: Magnitude of abnormal vaginal discharge among women of reproductive age attending Obstetrics and gynecology clinic.

Question	**Response Options**
1. Have you experienced any abnormal vaginal discharge?	[ ] Yes [ ] No
2. How would you describe the consistency of the discharge?	[ ] Thin [ ] Thick [ ] Clumpy [ ] Watery
Is there any noticeable odor associated with the discharge?	[ ] Yes [ ] No
4. How would you describe the odor?	[ ] Fishy [ ] Foul [ ] Yeasty [ ] Other: _____
5. Have you ever been previous diagnosed with, or received treatment for, vaginal infections? **If yes Specify**……	[ ] Yes [ ] No 1……. 2…….. 3……
6. How would you describe the color of the discharge?	[ ] White [ ] Yellow [ ] Green [ ] Gray [ ] Other: _____
7. Have you experienced any vaginal itching or irritation	[ ] Yes [ ] No
8. Have you experienced any pain or discomfort during urination?	[ ] Yes [ ] No
9. Have you experienced any pain or discomfort during sexual intercourse?	[ ] Yes [ ] No
14. How long have you been experiencing these symptoms?	[ ] Less than a week [ ] 1-2 weeks [ ] 2-4 weeks [ ] More than 4 weeks

Section C: Antimicrobial susceptibility with abnormal vaginal discharge among women of reproductive age attending obstetrics and gynecology clinic.

Antibiotics	**Susceptibility (S)**	**Intermediate (I)**	**Resistance (R)**
Ampicillin 10ug	S	I	R
Ceftriaxone ug30	S	I	R
Cefoxitine 30ug	S	I	R
Clindamycin2 ug	S	I	R
Azithromycin 15ug	S	I	R
Ciprofloxacin 5 ug	S	I	R
Doxycycline 30ug	S	I	R
Meropenem 10ug	S	I	R
Chloramphenicol 30 ug	S	I	R
Erythromycin 15 ug	S	I	R
Piperacillin tazobactam	S	I	R
Amoxicillin-Clavulanic acid	S	I	R
Gentamicin	S	I	R

APPENDIX 4: DODOSO KWA LUGHA YA KISWAHILI

Kichwa: Kiwango, upinzani wa viumbe hai na mambo yanayohusiana na kutokwa na maji yasiyo ya kawaida katika uke miongoni mwa wanawake wa umri wa uzazi wanaohudhuria kliniki ya uzazi na magonjwa ya wanawake katika Hospital ya Kairuki, Dar es Salaam, kuanzia January mpaka April 2025.

Tarehe: _____

Nambari ya Ushiriki: _____

Sehemu A: Sifa za kijamii na demografia na sifa za jumla za wanawake wa umri wa uzazi wanaohudhuria kliniki ya uzazi na magonjwa ya wanawake.

1. Umri: _____
2. Hali ya Ndoa:
    1. Ndoa
    2. Bila ndoa
    3. Talaka
    4. Mjane
3. Nini kiwango cha elimu ulichokamilisha?
    1. Shule ya Msingi
    2. Shule ya Sekondari
    3. Chuo au Mafunzo ya Ufundi
    4. Shahada ya Chuo Kikuu
    5. Shahada ya Uzamili au zaidi
4. Hali yako ya ajira ni ipi?

1. Nimeajiriwa
2. Sina ajira
3. Ni mfanyabiashara binafsi
4. Mwanafunzi
5. Nyumbani

5.Unakaa katika aina gani ya eneo ndani ya Dar es Salaam?

1. Ilala
2. Ubungo
3. Temeke
4. Kigamboni
5. Kinondoni

6. Kiasi cha mapato ya familia yako kwa mwezi ni kiasi gani?

1. chini ya 350,000/=
2. Chini ya 500,000/=
3. Zaidi ya 500,000

7. Je, una bima ya afya?

1. Ndio
2. Hapana

Historia ya Uzazi:

8. Je, umewahi kupata mimba ngapi?

1. Hakuna
2. 1
3. 2 au zaidi

9. Je, umewahi kupata Watoto? wangapi walio hai?

1. Hakuna

2. 1 3

3. 2 au zaidi

10. Je, umewahi kufanya utoaji mimba au kupoteza mtoto tumbon?

1. Ndio :(ikiwa ndio, tafadhali eleza:) Aina ya Utoaji mimba;

a) Abortion (Utoaji mimba kwa hiari)

b) Utoaji mimba wa bahati mbaya

c) Kuzaliwa mtoto aliekufa (Stillbirth)

2. Hapana

12. Je, unatumia njia yoyote ya uzazi wa mpango kwa sasa?

- 1. Ndio
- 2. Hapana

13. Ikiwa ndio, unatumia mbinu gani? (Chagua zote zinazohusu)

- 1. Vidonge vya uzazi wa mpango
- 2. Kondomu
- 3. Kidonge cha IUD (Intrauterine Device)
- 4. Kidonge cha kuziba (Implant)
- 5. Sindano ya Depo-Provera
- 6. Upasuaji wa kuzuia mimba (Tubal ligation)
- 7. Nyingine (tafadhali eleza) _____

Historia ya Afya:

14. Je, una matatizo ya kiafya ya muda mrefu?

- 1. Ndio

2. Hapana

Ikiwa "Ndio", tafadhali chagua hali ya kiafya:

1.HIV/AIDS

2. Kisukari

3. Ugonjwa mwingine wowote ule?

Historia ya afya

xiv. Je, kwa sasa unatumia dawa yoyote?

1. Ndio

2. Hapana

Ikiwa "Ndio", tafadhali eleza dawa unazotumia: _____

Tabia za Afya:

xv. Je, unavuta bidhaa za tumbaku?

1. Ndio, kila siku

2. Ndio, mara kwa mara

3. Hapana, nilikuwa navuta lakini nimesitisha

4. Hapana, sijawahi

xvi. Mara ngapi unakunywa pombe?

1. Kila siku

2. Kila wiki

3. Kila mwezi

4. Mara kwa mara

5. Sijawahi

Masuala ya Uzazi na Magonjwa ya Wanawake:

xvii. Je, umewahi kutibiwa au kugundulika kuwa na hali yoyote ya magonjwa ya uzazi (gynecological)?

1. Ndio

2. Hapana

xviii. Je, unapata matatizo ya hedhi au maumivu?

1. Ndio

2. Hapana

Mipango ya Uzazi:

xix. Je, una mipango ya kupata watoto katika siku zijazo?

1. Ndio

2. Hapana

xx. Je, kwa sasa unatumia njia yoyote ya kuzuia mimba?

1. Ndio

2. Hapana

Sehemu B: Kiwango cha utoaji wa maji ya uke yasiyo ya kawaida miongoni mwa wanawake wa umri wa uzazi wanaohudhuria kliniki ya uzazi na magonjwa ya wanawake.

Swali:

| Chaguo la Majibu:

1. Je, umewahi kupata utoaji maji yasiyo ya kwaida ya ukeni?

[] Ndio

[] Hapana

2. Je, ungeelezeaje umbo la utoaji wa maji ya yasiyo ya kawaida ya ukeni?

[] Nyembamba

[] Nene

[] Majimaji

3. Je, kuna harufu inayojitokeza na utoaji huu wa maji ya uke? |

4. [ ] Ndio

5. [ ] Hapana

Je, ungeelezeaje harufu hiyo?

[ ] Harufu mbaya

[ ] Harufu ya chachu

[ ] Nyingine: _____

6. Je, umewahi kutibiwa au kupata utambuzi wa maambukizi ya uke? Ikiwa ndio, tafadhali eleza: | [ ] Ndio [ ] Hapana

1. _____ 2. _____ 3. _____

6. Je, ungeelezeaje rangi ya utoaji wa maji yasiyo ya kawaida ya uke? | [ ] Nyeupe [ ] Njano [ ] Kijani [ ] Rangi ya kijivu [ ] Nyingine: _____

7. Je, umewahi kupata mwasho au usumbufu katika uke?

| [ ] Ndio [ ] Hapana

7. Je, umewahi kupata maumivu au usumbufu wakati wa kukojoa?

8. | [ ] Ndio [ ] Hapana

9. Je, umewahi kupata maumivu au usumbufu wakati wa tendo la ndoa?

[ ] Ndio

[ ] Hapana

14. Umekua na dalili hizi kwa muda gani? |

[ ] Chini ya wiki moja

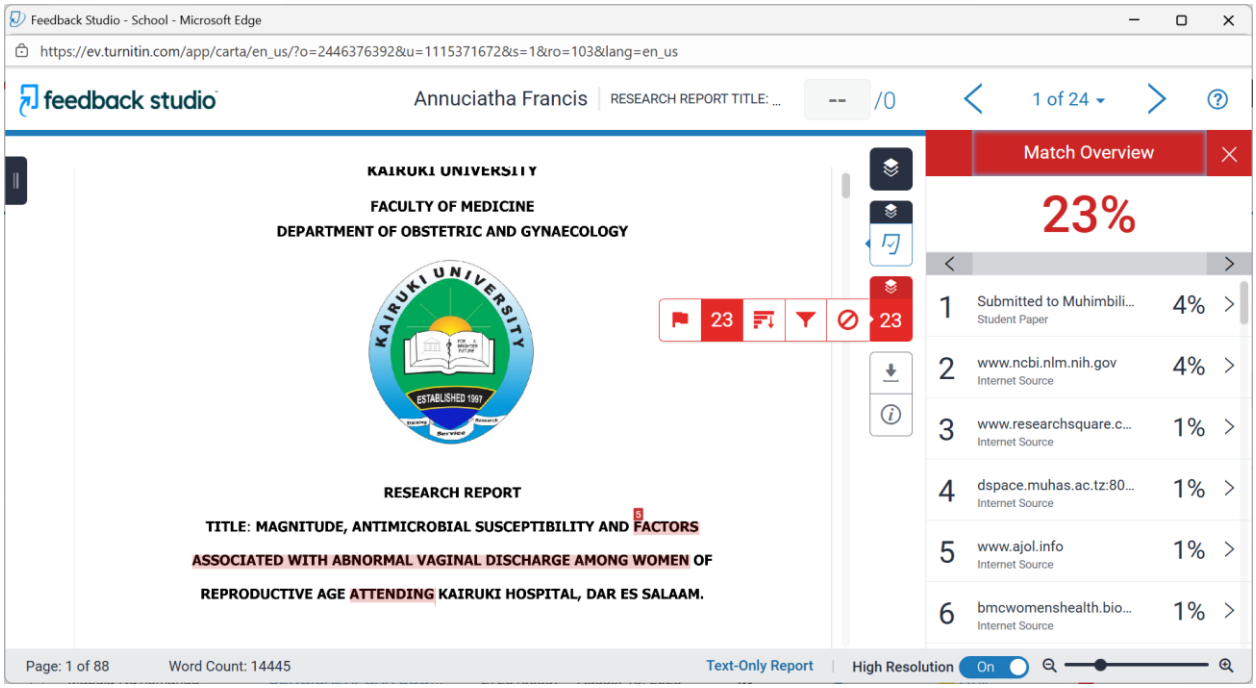
[ ] Wiki 1-2

[ ] Wiki 2-4

[ ] Zaidi, ya wiki 4

Sehemu C: Ufanisi wa dawa za kuzuia maambukizi (Antimicrobial susceptibility) kwa utoaji wa maji ya uke yasiyo ya kawaida miongoni mwa wanawake wa umri wa uzazi wanaohudhuria kliniki ya uzazi na magonjwa ya wanawake.

Antibiotics	**Susceptibility (S)**	**Intermediate (I)**	**Resistance (R)**
Ampicillin 10ug	S	I	R
Ceftriaxone 30ug	S	I	R
Clindamycin 2ug	S	I	R
Cefoxitin 30ug	S	I	R
Azithromycin 15ug	S	I	R
Ciprofloxacin 5 ug	S	I	R
Doxycycline 30 ug	S	I	R
Chloramphenicol 30ug	S	I	R
Meropenem 10ug	S	I	R
Amoxicillin-Clavulanic acid	S	I	R
Piperacillin tazobactam	S	I	R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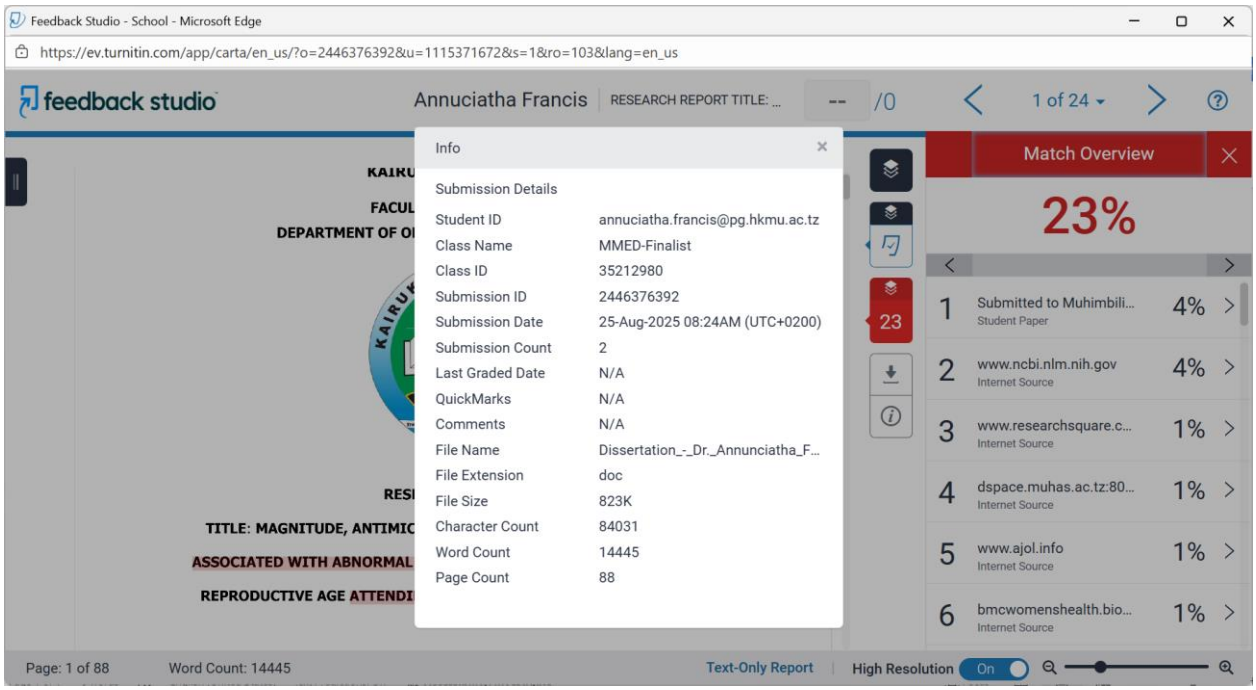
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