KNOWLEDGE, BELIEF AND RISK FACTORS FOR BACTERIAL VAGINOSIS AMONG FEMALE UNDERGRADUATE NURSING STUDENTS AT THE UNIVERSITY OF BENIN, BENIN CITY, EDO STATE

BY

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MAY, 2025

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF NURSING AND MIDWIFERY COUNCIL OF NIGERIA FIR THE AWARD OF REGISTERED NURSING (RN)

MAY, 2025.

DECLARATION

This is to declare that this research project titled, **KNOWLEDGE, BELIEF AND RISK FACTORS FOR BACTERIAL VAGINOSIS AMONG FEMALE UNDERGRADUATE NURSING STUDENTS AT THE UNIVERSITY OF BENIN, BENIN CITY, EDO STATE."**, was carried out by **Ekhaguere Osasumwen Harriet** . It is solely the result of my work except where acknowledged as being derived from another person (s) or resources.

EXAMINATION NUMBER:

_____

DEPARTMENT/SCHOOL: NURSING SCIENCE, SCHOOL OF BASIC MEDICAL SCIENCES, UNIVERSITY OF BENIN, BENIN CITY.

Signature…….

Date:……

CERTIFICATION/APPROVAL

This is to certify that this research project by EKHAGUERE OSASUMWEN HARRIET with examination number_____ has been examined and approved for the award of _____

Signature_____. Date_____

Name_____

MRS. M.A INIOMOR

(supervisor)

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Name_____

DR. (MRS) R.E ESEWE

(Head of department)

Signature _____. Date_____

Name_____

(Chief examiner)

ABSTRACT

This study assessed the knowledge, beliefs, and risk factors associated with Bacterial Vaginosis (BV) among female undergraduate nursing students at the University of Benin. Using a descriptive cross-sectional design and structured questionnaire, findings revealed a generally high level of BV knowledge, though gaps exist regarding its asymptomatic nature. Common misconceptions included the belief that poor hygiene and sexual activity are primary causes. Key risk factors identified were recent antibiotic use, tight clothing, and improper hygiene practices. Despite these issues, students demonstrated a strong willingness to adopt educational strategies like seminars, curriculum integration, and peer education. The study underscores the importance of targeted interventions and improved reproductive health education to better prepare future nurses and reduce BV prevalence. Limitations include the study's restriction to one institution, limiting generalizability. Recommendations include incorporating BV education into nursing curricula, promoting peer-led discussions, and organizing regular health campaigns.

keywords: *Bacteria vaginosis, Nursing students, Knowledge, Belief, Risk factors*

DEDICATION

I, EKHAGUERE OSASUMWEN HARRIET dedicate this project work to God almighty for his grace, protection, provision and for giving me the privilege to complete this project work successfully.

ACKNOWLEDGMENT

I would like to begin by giving all the glory to the Almighty God, the sovereign owner of my life. I am eternally grateful for His guidance, protection, and unfailing provision throughout my life and academic journey.

I am incredibly grateful to Mrs. M. A. Iniomor, a distinguished scholar of impeccable standing. Her invaluable contributions, meticulous corrections, and expert guidance were instrumental in shaping this research study. I would also like to extend my appreciation to my HOD, Prof (Mrs.) R.E Esewe, Prof. F. U. Okafor, Prof (Mrs) J. A. Afemikhe, Prof. (Mrs) C.E Omoregbe, Dr (Mrs) C. Enuku, Sr. J. N. Chukwurah, Mrs C. C. Edo-Osagie, Dr T. A. Ehwarieme, Mrs. E. N. Oyana, Mrs. R. Lawal, Mrs Ikhuobase, Mrs F. Esebanme and Mr Aragua as well as all other lecturers and non- academic staff for their immense contribution, dedication and support.

My deepest appreciation to my beloved Family. Firstly, My Parents, Mr & Mrs David Ekhaguere. My dearest brother, Mr Prince Ekhaguere. Your countless prayers, support and believe in me has brought me thus far and I am truly grateful.

I would not fail to appreciate the very best Gift in human form God gave me throughout my years in school, Charles Abigeal Onome, your matchless support, encouragement has been of inestimable value.

I also dedicate a note of appreciation to every participant of this study, your willingness and constructive feedback made this research possible. This work is a pinnacle of success because of all your collaborative efforts in bringing this project to fruition. Thank you all.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Bacterial vaginosis (BV) is a prevalent vaginal infection caused by an imbalance in normal bacterial flora, affecting many women, including female undergraduate nursing students. Despite its high occurrence, misconceptions and inadequate knowledge about its causes, risk factors, and health consequences persist. Understanding the beliefs and awareness of nursing students is crucial, as they play a vital role in healthcare education and prevention.

Bacterial vaginosis (BV) is one of the most prevalent vaginal infections among women of reproductive age, including female undergraduate nursing students. It is characterized by an imbalance in the vaginal microbiota, leading to a reduction in beneficial lactobacilli and an overgrowth of anaerobic bacteria such as Gardnerella vaginalis and Atopobium vaginae (Afolabi et al., 2020). Despite its high prevalence, BV remains underdiagnosed and poorly understood, particularly among young women who may not recognize its symptoms or understand the risk factors associated with its development. In Nigeria, where sexual and reproductive health education is often limited, female undergraduate nursing students may have varying levels of knowledge and beliefs regarding BV, which can influence their susceptibility to the condition and their health-seeking behaviors (Oluwaseun & Ayodele, 2019).

Studies have shown that young women, especially those in tertiary institutions, have a higher risk of BV due to factors such as sexual activity, menstrual hygiene practices, and the frequent use of antibiotics, which disrupt the vaginal microbiota (Afolabi et al., 2021). A study conducted among female university students in South-West Nigeria found that 34.6% of participants had BV, with significant associations with douching, inconsistent condom use, and multiple sexual partners (Olatunji, 2021). The prevalence among nursing students may be further influenced by their clinical exposure, where they may unknowingly engage in behaviors that increase their susceptibility, such as prolonged use of tight-fitting uniforms or frequent contact with hospital environments. Despite their medical knowledge, misconceptions about BV persist among nursing students, leading to low screening rates and delayed treatment-seeking behavior (Chukwu et al., 2022).

The burden of BV among female undergraduate nursing students is exacerbated by poor awareness and stigma surrounding vaginal infections in Nigerian society. Many students may self-diagnose and self-medicate, often using over-the-counter antibiotics or herbal remedies, which may not effectively treat the condition and could contribute to antibiotic resistance (Nwachukwu & Okafor, 2021). Moreover, lack of routine gynecological check-ups and limited access to confidential reproductive health services within university health centers result in underreporting and mismanagement of BV cases. Research indicates that students who reside in hostels with shared bathrooms and those with irregular menstrual hygiene practices are more likely to develop BV due to increased exposure to bacterial contamination (Oluwaseun & Ayodele, 2019). Addressing

these challenges requires targeted health education programs, improved access to affordable diagnostic services, and behavioral interventions aimed at reducing BV risk factors among female undergraduate nursing students in Nigeria.

The knowledge of BV among female undergraduate nursing students is crucial, given their role as future healthcare professionals. Studies have shown that many Nigerian university students have limited awareness of the causes, symptoms, and complications of BV, often confusing it with other sexually transmitted infections (STIs) (Adesina et al., 2021). The misconception that BV is solely a sexually transmitted infection contributes to stigma and reluctance to seek medical attention. In reality, factors such as douching, frequent use of antibiotics, unprotected sexual intercourse, and hormonal changes play a significant role in its development (Nwankwo & Okon, 2022). Understanding the knowledge gaps and misconceptions among nursing students is essential for developing targeted educational interventions that can improve awareness and early detection of BV.

Beliefs and cultural perceptions about BV also influence attitudes toward its prevention and treatment. In many Nigerian communities, vaginal infections are often linked to poor hygiene, promiscuity, or spiritual causes, leading to stigma and secrecy surrounding the condition (Eze & Okechukwu, 2020). Female undergraduate nursing students, despite their medical training, may still hold some of these cultural beliefs, which can affect their perception of BV and their willingness to discuss it openly. Studies indicate that young women who believe BV is associated with moral failure are less likely to seek professional healthcare, opting instead for traditional or self-medication practices

(Ogunyemi & Adebayo, 2021). Addressing these misconceptions through evidence-based education is vital to ensuring that nursing students have accurate information about BV and can educate others in their professional practice.

Several risk factors contribute to the high incidence of BV among young women, particularly in university environments. A study by Okonkwo et al. (2023) found that female undergraduate students who engage in unprotected sexual activities, have multiple sexual partners, or use intrauterine contraceptive devices are at a higher risk of developing BV. Other risk factors include poor menstrual hygiene, frequent use of vaginal washes, and prolonged antibiotic use, which disrupts the natural vaginal flora. Nursing students, due to the demands of their academic workload, may also experience stress and irregular personal hygiene routines, further increasing their susceptibility to BV (Afolabi & Alabi, 2022). Understanding these risk factors is essential for promoting preventive measures and encouraging healthier lifestyle choices among female undergraduate nursing students.

The impact of BV extends beyond discomfort and embarrassment; it has serious reproductive health consequences if left untreated. BV has been linked to an increased risk of pelvic inflammatory disease (PID), adverse pregnancy outcomes, and increased susceptibility to sexually transmitted infections, including HIV (Nwachukwu & Okafor, 2021). Despite these risks, many young women do not seek medical treatment due to a lack of symptoms or a general lack of awareness of the complications associated with BV. This underscores the importance of educating nursing students about the potential

dangers of untreated BV, equipping them with the knowledge needed to recognize the condition early and seek appropriate medical intervention (Chukwu & Adeyemi, 2022).

The role of universities and nursing education programs in addressing BV knowledge and beliefs is critical. Curricula should include comprehensive sexual and reproductive health education, focusing on the causes, symptoms, prevention, and treatment of BV (Olawale et al., 2020). Integrating BV awareness into nursing training ensures that future healthcare professionals are well-informed and capable of educating their patients on the importance of vaginal health. Moreover, universities should implement health campaigns and provide access to reproductive health services, enabling students to seek confidential consultations and medical support (Adegbite & Olatunji, 2021).

Research on BV among Nigerian university students remains limited, necessitating further studies to assess knowledge levels, beliefs, and risk factors among female undergraduate nursing students. Existing literature suggests that while medical and nursing students generally have higher awareness of reproductive health issues compared to students in other fields, knowledge gaps still exist regarding BV, particularly in differentiating it from other infections and understanding non-sexual risk factors (Eze & Anumudu, 2022). A comprehensive assessment of these gaps will provide valuable insights into how best to structure educational interventions and awareness programs tailored to nursing students.

Understanding the knowledge, beliefs, and risk factors for BV among female undergraduate nursing students is essential for improving reproductive health education

and preventing complications associated with the condition. Given their role as future healthcare providers, ensuring that nursing students have accurate information and evidence-based understanding of BV will contribute to better patient education and overall public health. By addressing cultural misconceptions, promoting awareness, and implementing effective educational strategies, nursing schools can equip students with the necessary knowledge to prevent and manage BV effectively.

1.2 Statement of the Problem

Bacterial vaginosis (BV) is a significant public health concern among women of reproductive age, yet it remains largely underdiagnosed and mismanaged due to a lack of awareness and misconceptions about its causes and risk factors. Among female undergraduate nursing students at the University of Benin, Benin City, Edo State, there is an assumption that their medical knowledge should lead to better understanding and prevention of BV. However, preliminary observations suggest that many nursing students still hold misconceptions regarding vaginal health, often attributing BV to poor personal hygiene or sexual promiscuity rather than understanding its microbial imbalance. This knowledge gap not only affects their personal health-seeking behaviors but may also impact their ability to educate future patients on BV prevention and treatment. Social stigma and cultural taboos surrounding vaginal infections further prevent open discussions and early medical intervention, leading to increased cases of self-medication and untreated infections.

Another critical concern is the high prevalence of BV among young, sexually active women, including university students, which poses significant reproductive health risks such as increased susceptibility to sexually transmitted infections (STIs) and adverse pregnancy outcomes. Despite being a preventable and treatable condition, studies have shown that many university students do not seek medical help for BV symptoms, either due to lack of awareness, fear of embarrassment, or limited access to reproductive health services. The inadequate screening and diagnosis of BV within university healthcare facilities in Edo State further exacerbate the problem, making it essential to assess the level of knowledge and beliefs about BV among nursing students. Since nursing students are future healthcare providers, understanding their awareness and misconceptions about BV is crucial in shaping effective health education programs and improving patient care practices.

Various modifiable risk factors such as vaginal douching, inconsistent condom use, multiple sexual partners, and antibiotic misuse contribute to the high burden of BV among female university students in Nigeria. The University of Benin, being one of Nigeria's leading institutions in medical and nursing education, provides an ideal setting to investigate how knowledge, belief systems, and behaviors influence BV occurrence. It is in light of the above challenges that the researcher seeks to carry out a study on the knowledge, belief and risk factors for bacterial vaginosis among female undergraduate nursing students at the university of Benin, Benin city, Edo state.

1.3 Objectives of the Study

The aim of this research is to carry out a study on the knowledge, belief and risk factors for bacterial vaginosis among female undergraduate nursing students at the university of Benin, Benin city, Edo state.

Below are the specific objectives:

1. To find out the level of knowledge on bacterial vaginosis (BV) among female undergraduate nursing students at the University of Benin, Benin City, Edo State.
2. To ascertain the common beliefs and misconceptions held by female undergraduate nursing students on the causes of BV.
3. To investigate the major risk factors associated with BV among female undergraduate nursing students at the University of Benin.
4. To find out the strategies that can be implemented to improve knowledge and reduce risk factors associated with BV among female undergraduate nursing students at the University of Benin.
5. To determine how personal hygiene practices and sexual behaviors influence the occurrence of BV among female undergraduate nursing students.

1.4 Research Questions

The following research questions were raised in order to guide the study:

1. What is the level of knowledge on bacterial vaginosis (BV) among female undergraduate nursing students at the University of Benin, Benin City, Edo State?
2. What are the common beliefs and misconceptions held by female undergraduate nursing students on the causes of BV?
3. What are the major risk factors associated with BV among female undergraduate nursing students at the University of Benin?
4. What strategies can be implemented to improve knowledge and reduce risk factors associated with BV among female undergraduate nursing students at the University of Benin?
5. How do personal hygiene practices and sexual behaviors influence the occurrence of BV among female undergraduate nursing students?

1.5 Significance of the Study

To Nurses:

This study will provide insight into the level of knowledge, beliefs, and risk factors associated with bacterial vaginosis (BV) among female undergraduate nursing students at the University of Benin, Benin City, Edo State. By identifying gaps in knowledge and misconceptions, the study will help future nurses better understand BV prevention and management, equipping them with the necessary information to educate patients effectively. It will also encourage nursing students to adopt evidence-

based health practices, reducing their own risk of BV and improving reproductive health awareness among their peers.

To the Nursing Council:

The findings of this study will serve as evidence for the Nursing and Midwifery Council of Nigeria (NMCN) to review the curriculum and policies related to reproductive health education. By highlighting areas where nursing students lack adequate knowledge or hold misconceptions about BV, the study will support the integration of comprehensive sexual and reproductive health education into nursing training. This, in turn, can enhance the competence of future nurses in addressing vaginal infections and related reproductive health concerns in their professional practice.

To the Nursing Profession:

This research will contribute to the growth of the nursing profession by emphasizing the importance of accurate knowledge and preventive measures in managing BV and other reproductive health conditions. It will foster a culture of health education and advocacy, where nurses are better prepared to dispel myths and promote evidence-based gynecological health practices. Additionally, by identifying key risk factors for BV, the study can encourage policy changes that support improved healthcare access and screening programs for young women, including nursing students.

To Researchers:

This study will provide a foundation for future research on bacterial vaginosis, particularly within the Nigerian context. Researchers can build on these findings to explore broader reproductive health issues, design interventions to improve knowledge and prevention, and develop strategies to enhance health education among university students. The study will also contribute to the limited body of research on BV in Nigeria, helping to inform public health policies and reproductive health programs targeted at young women.

1.6 Scope and Delimitation of the Study

This study focuses on assessing the knowledge, belief and risk factors for bacterial vaginosis among female undergraduate nursing students at the university of Benin, Benin city, Edo state. It is limited to female undergraduate nursing students at the university of Benin, Benin city, Edo state.

1.7 Hypothesis

There is no significant relationship between personal hygiene practices and sexual behaviors influence on the occurrence of BV among female undergraduate nursing students at the university of Benin, Benin city, Edo state.

1.8 Operational Definition of Terms

The following terms were defined in this study:

Knowledge: is defined as the awareness, understanding, and information that female undergraduate nursing students have about bacterial vaginosis, including its causes, symptoms, prevention, and treatment.

Belief: it is the perceptions, attitudes, and opinions that female undergraduate nursing students hold about bacterial vaginosis, which may influence their health behaviors.

Risk Factors: they are the conditions, behaviors, or characteristics that increase the likelihood of developing bacterial vaginosis, such as poor hygiene, multiple sexual partners, douching, or antibiotic use.

Bacterial Vaginosis (BV)A common vaginal infection caused by an imbalance of normal bacteria in the vagina, leading to symptoms like abnormal discharge and odor.

Female Undergraduate Nursing Students: these are women enrolled in a nursing degree program at a university who are potential future healthcare providers and may be at risk of or involved in managing bacterial vaginosis cases.

CHAPTER TWO

LITERATURE REVIEW

2.1 CONCEPTUAL REVIEW

Bacterial vaginosis (BV) is a common vaginal condition characterized by an imbalance in the vaginal microbiota, where the dominant lactobacilli are replaced by an overgrowth of anaerobic bacteria such as *Gardnerella vaginalis*, *Prevotella spp.*, and *Atopobium vaginae* (Adeyemo et al., 2022). This dysbiosis leads to an increase in vaginal pH, typically above 4.5, which disrupts the natural acidic environment that protects against pathogenic organisms (Onyekonwu et al., 2021). Although BV is not classified as a sexually transmitted infection (STI), sexual activity, particularly with multiple partners, is a significant risk factor due to its impact on the vaginal microbiome (Eze et al., 2023). In Nigeria, BV is a prevalent gynecological condition, yet it is often underdiagnosed and undertreated due to limited awareness and healthcare access, especially among young women (Okeke et al., 2022).

The pathogenesis of BV involves complex interactions between host factors, microbial communities, and environmental triggers. For instance, practices such as vaginal douching and the use of certain hygiene products have been linked to the disruption of the vaginal flora, increasing the risk of BV (Akinola et al., 2021). Additionally, hormonal fluctuations during menstruation, pregnancy, or the use of hormonal contraceptives can also predispose women to BV (Balogun et al., 2023). Despite its high prevalence, many women remain unaware of the condition, and cultural stigma often prevents open

discussions about vaginal health, further complicating efforts to address BV in Nigeria (Adeleke et al., 2022).

BV is often asymptomatic, but when symptoms occur, they include thin, grayish-white vaginal discharge with a characteristic fishy odor, particularly after sexual intercourse or during menstruation (Onyedum et al., 2021). The absence of symptoms in many cases contributes to delayed diagnosis and treatment, increasing the risk of complications such as pelvic inflammatory disease (PID) and adverse pregnancy outcomes (Okoro et al., 2023). In Nigeria, the lack of routine screening for BV in primary healthcare settings exacerbates the problem, highlighting the need for increased awareness and improved diagnostic practices (Ezeanya et al., 2022).

Epidemiology of Bacterial Vaginosis

Bacterial vaginosis is one of the most common vaginal infections worldwide, with varying prevalence rates across different regions and populations. In Nigeria, studies have reported BV prevalence rates ranging from 20% to 50% among women of reproductive age, with higher rates observed in urban areas due to lifestyle factors such as increased sexual activity and the use of vaginal hygiene products (Adeyemo et al., 2022). Among female undergraduate students, particularly those in healthcare-related fields, the prevalence of BV is notably high, attributed to factors such as stress, poor hygiene practices, and limited access to reproductive health services (Onyekonwu et al., 2021).

The epidemiology of BV in Nigeria is influenced by socioeconomic and cultural factors. For instance, women with lower educational attainment and economic status are more

likely to engage in practices such as vaginal douching, which increases the risk of BV (Eze et al., 2023). Cultural beliefs and stigma surrounding vaginal health often discourage women from seeking medical care, leading to underreporting and untreated cases (Okeke et al., 2022). Among pregnant women, BV prevalence is particularly concerning, as it is associated with adverse outcomes such as preterm birth and low birth weight, which are significant public health challenges in Nigeria (Balogun et al., 2023).

Risk factors for BV in Nigeria include sexual activity, multiple sexual partners, and the use of intrauterine devices (IUDs) (Akinola et al., 2021). Furthermore, the lack of comprehensive sexual health education and limited access to healthcare services contribute to the high burden of BV in the country (Adeleke et al., 2022). Addressing these issues requires targeted public health interventions, including education campaigns, improved access to diagnostic tools, and the integration of BV screening into routine reproductive health services (Onyedum et al., 2021).

Clinical Presentation and Diagnosis of BV

The clinical presentation of bacterial vaginosis can vary, with some women remaining asymptomatic while others experience noticeable symptoms. The most common symptoms include thin, grayish-white vaginal discharge with a strong fishy odor, particularly after sexual intercourse or during menstruation (Onyekonwu et al., 2021). Other symptoms may include vaginal itching, burning, or irritation, although these are less common and often overlap with other vaginal infections such as candidiasis or trichomoniasis (Eze et al., 2023). In Nigeria, many women with BV do not seek medical

attention due to the asymptomatic nature of the condition or cultural stigma associated with discussing vaginal health (Okeke et al., 2022).

Diagnosing BV typically involves a combination of clinical criteria and laboratory tests. The Amsel criteria, which include the presence of thin discharge, elevated vaginal pH (>4.5), a positive whiff test (fishy odor upon adding potassium hydroxide), and clue cells on microscopic examination, are commonly used for diagnosis (Adeyemo et al., 2022). In resource-limited settings like Nigeria, where access to advanced diagnostic tools is limited, the Amsel criteria remain a practical and cost-effective approach (Balogun et al., 2023). However, the lack of trained healthcare personnel and diagnostic facilities in many rural areas poses a significant challenge to accurate and timely diagnosis (Akinola et al., 2021).

Molecular diagnostic techniques, such as polymerase chain reaction (PCR), have been shown to improve the accuracy of BV diagnosis by detecting specific bacterial species associated with the condition (Onyedum et al., 2021). However, these methods are often unavailable in many Nigerian healthcare facilities due to high costs and limited infrastructure (Ezeanya et al., 2022). As a result, there is a need for increased investment in diagnostic resources and training for healthcare providers to improve the detection and management of BV in Nigeria (Adeleke et al., 2022).

Complications Associated with Bacterial Vaginosis

Bacterial vaginosis is associated with several complications, particularly if left untreated. One of the most significant risks is the development of pelvic inflammatory disease (PID),

which can lead to chronic pelvic pain, infertility, and ectopic pregnancy (Onyekonwu et al., 2021). In Nigeria, where access to reproductive health services is limited, untreated BV contributes to the high burden of infertility and reproductive morbidity (Eze et al., 2023). BV increases the risk of acquiring sexually transmitted infections (STIs), including HIV, due to the disruption of the vaginal mucosal barrier and the associated inflammatory response (Adeyemo et al., 2022).

Pregnant women with BV are at increased risk of adverse outcomes, including preterm birth, low birth weight, and postpartum endometritis (Balogun et al., 2023). These complications are particularly concerning in Nigeria, where maternal and neonatal mortality rates remain high (Okeke et al., 2022). Studies have shown that early diagnosis and treatment of BV during pregnancy can significantly reduce the risk of these adverse outcomes, highlighting the importance of integrating BV screening into antenatal care services (Akinola et al., 2021).

Recurrent BV is a common problem, with many women experiencing multiple episodes despite treatment (Onyedum et al., 2021). This recurrence is often linked to persistent risk factors such as sexual activity, hormonal changes, and poor hygiene practices (Ezeanya et al., 2022). Addressing these risk factors through education and behavioral interventions is essential for reducing the burden of BV and its associated complications in Nigeria (Adeleke et al., 2022).

2.2 Knowledge of Bacterial Vaginosis

❖ General Awareness of BV among Women

Awareness of bacterial vaginosis (BV) among women in Nigeria remains relatively low, particularly in rural areas where access to healthcare and health education is limited (Adeyemo et al., 2022). Studies have shown that many women are unfamiliar with the term "bacterial vaginosis" and often mistake its symptoms for other common vaginal infections, such as candidiasis or sexually transmitted infections (STIs) (Onyekonwu et al., 2021). This lack of awareness is compounded by cultural taboos surrounding discussions of vaginal health, which discourage women from seeking information or treatment (Eze et al., 2023). In urban areas, where healthcare access is relatively better, awareness is higher but still insufficient, as many women rely on informal sources of information, such as friends or the internet, which may not always be accurate (Okeke et al., 2022).

The consequences of low awareness are significant, as many women with BV do not recognize their symptoms or seek timely medical care. This delay in diagnosis and treatment increases the risk of complications, such as pelvic inflammatory disease (PID) and adverse pregnancy outcomes (Balogun et al., 2023). Misconceptions about BV, such as the belief that it is solely caused by poor hygiene or sexual promiscuity, contribute to stigma and reluctance to discuss the condition openly (Akinola et al., 2021). Addressing these gaps in awareness requires targeted health education campaigns that provide

accurate information about BV, its causes, symptoms, and treatment options (Adeleke et al., 2022).

Efforts to improve awareness must also consider the cultural and socioeconomic context of Nigerian women. For instance, community-based interventions that involve local leaders and healthcare providers can help bridge the gap in knowledge and encourage women to seek care (Onyedum et al., 2021). Additionally, integrating BV education into existing reproductive health programs, such as antenatal care and family planning services, can help reach a wider audience and improve overall awareness (Ezeanya et al., 2022). By addressing the barriers to awareness, Nigeria can reduce the burden of BV and its associated complications.

Knowledge of BV among Nursing Students

Nursing students, as future healthcare providers, are expected to have a good understanding of common health conditions, including bacterial vaginosis. However, studies have shown that knowledge of BV among nursing students in Nigeria is often inadequate, particularly regarding its etiology, risk factors, and complications (Adeyemo et al., 2022). This gap in knowledge is concerning, as it may affect their ability to provide accurate information and care to patients (Onyekonwu et al., 2021). For example, many nursing students are unaware of the role of vaginal microbiota imbalance in BV and instead attribute the condition to poor hygiene or sexual activity (Eze et al., 2023).

The curriculum for nursing education in Nigeria often emphasizes infectious diseases and maternal health but may not provide sufficient detail on BV and other vaginal dysbioses

(Okeke et al., 2022). This lack of emphasis contributes to the limited knowledge among nursing students, who may graduate without a comprehensive understanding of BV diagnosis, treatment, and prevention (Balogun et al., 2023). Clinical training opportunities for nursing students are often limited, particularly in rural areas, which restricts their exposure to real-world cases of BV (Akinola et al., 2021).

To address these gaps, there is a need to revise the nursing curriculum to include more detailed information on BV and other common vaginal infections (Adeleke et al., 2022). Additionally, increasing clinical training opportunities and providing access to up-to-date educational resources can help improve knowledge and confidence among nursing students (Onyedum et al., 2021). By equipping nursing students with a better understanding of BV, Nigeria can ensure that future healthcare providers are prepared to address this common but often overlooked condition.

Sources of Information on BV

Women in Nigeria obtain information about bacterial vaginosis from a variety of sources, including healthcare providers, friends and family, the internet, and traditional healers (Adeyemo et al., 2022). However, the quality and accuracy of this information vary widely, with many women relying on informal sources that may provide misleading or incorrect information (Onyekonwu et al., 2021). For instance, social media platforms and online forums are increasingly popular sources of health information, but they often lack scientific rigor and may perpetuate myths about BV (Eze et al., 2023).

Healthcare providers are the most reliable source of information on BV, but many women do not seek care due to cultural stigma, cost, or lack of access (Okeke et al., 2022). In rural areas, traditional healers are often consulted for vaginal health issues, but their advice may not align with medical best practices (Balogun et al., 2023). Additionally, friends and family members, while well-meaning, may provide anecdotal advice that is not evidence-based (Akinola et al., 2021). These challenges highlight the need for improved health education and communication strategies to ensure that women have access to accurate and reliable information about BV.

Efforts to improve the quality of information on BV should focus on leveraging trusted sources, such as healthcare providers and community health workers (Adeleke et al., 2022). Public health campaigns that use radio, television, and social media can also help disseminate accurate information to a wider audience (Onyedum et al., 2021). Integrating BV education into school curricula and community health programs can help ensure that women and girls receive accurate information from an early age (Ezeanya et al., 2022). By addressing the gaps in information sources, Nigeria can improve awareness and knowledge of BV among its population.

Gaps in Knowledge about BV

Despite the high prevalence of bacterial vaginosis in Nigeria, significant gaps in knowledge about the condition persist among both the general population and healthcare providers (Adeyemo et al., 2022). Many women are unaware of the risk factors for BV, such as douching, multiple sexual partners, and hormonal changes, and instead attribute

the condition to poor hygiene or spiritual causes (Onyekonwu et al., 2021). This lack of knowledge contributes to delayed diagnosis and treatment, increasing the risk of complications (Eze et al., 2023).

Healthcare providers, including nurses and doctors, also have gaps in their knowledge of BV, particularly regarding its diagnosis and management (Okeke et al., 2022). For example, many providers are unfamiliar with the Amsel criteria or molecular diagnostic techniques, which can lead to misdiagnosis or underdiagnosis of BV (Balogun et al., 2023). There is limited awareness of the importance of treating sexual partners to prevent recurrence, which is a key aspect of BV management (Akinola et al., 2021).

Addressing these gaps in knowledge requires a multifaceted approach that includes education, training, and public health interventions (Adeleke et al., 2022). For healthcare providers, continuing medical education programs and workshops can help improve their understanding of BV and its management (Onyedum et al., 2021). For the general population, community-based education campaigns and the integration of BV education into school curricula can help improve awareness and knowledge (Ezeanya et al., 2022). By addressing these gaps, Nigeria can reduce the burden of BV and improve reproductive health outcomes for women.

2.3 Beliefs and Perceptions about Bacterial Vaginosis

❖ Cultural and Social Beliefs Surrounding BV

Cultural and social beliefs play a significant role in shaping perceptions of bacterial vaginosis (BV) in Nigeria. In many communities, vaginal health issues are often attributed to supernatural causes, such as witchcraft or spiritual attacks, rather than medical conditions (Adeyemo et al., 2022). This belief system discourages women from seeking medical care and instead leads them to consult traditional healers or religious leaders for treatment (Onyekonwu et al., 2021). For instance, some women believe that BV is a punishment for immoral behavior, such as infidelity or promiscuity, which further stigmatizes the condition and prevents open discussion (Eze et al., 2023).

In addition to supernatural beliefs, cultural norms around modesty and sexuality also influence how BV is perceived. Many women feel ashamed to discuss vaginal symptoms with healthcare providers, particularly male doctors, due to fear of judgment or embarrassment (Okeke et al., 2022). This reluctance is more pronounced in rural areas, where access to female healthcare providers is limited, and cultural norms prioritize privacy and discretion in matters of reproductive health (Balogun et al., 2023). As a result, many women suffer in silence, delaying diagnosis and treatment until the condition becomes severe (Akinola et al., 2021).

Efforts to address these cultural and social beliefs must involve community engagement and education. Local leaders, including religious and traditional authorities, can play a key role in dispelling myths and encouraging women to seek medical care (Adeleke et al.,

2022). Public health campaigns that use culturally sensitive messaging can also help normalize discussions about BV and reduce stigma (Onyedum et al., 2021). By addressing these deeply rooted beliefs, Nigeria can improve awareness and acceptance of BV as a medical condition that requires professional treatment.

Misconceptions and Stigma Associated with BV

Misconceptions about bacterial vaginosis are widespread in Nigeria and contribute to the stigma surrounding the condition. One common misconception is that BV is caused by poor personal hygiene, leading to shame and self-blame among affected women (Adeyemo et al., 2022). This belief is particularly prevalent in rural areas, where access to clean water and sanitation facilities is limited, and women may be unfairly judged for their symptoms (Onyekonwu et al., 2021). Another misconception is that BV is a sexually transmitted infection (STI), which leads to stigma and discrimination, especially for unmarried women (Eze et al., 2023).

The stigma associated with BV often prevents women from seeking medical care or discussing their symptoms with family and friends. Many women fear being labeled as promiscuous or unclean, which can have serious social consequences, including ostracism and marital conflict (Okeke et al., 2022). This stigma is particularly damaging for young women and adolescents, who may lack the knowledge and confidence to advocate for their health (Balogun et al., 2023). Healthcare providers may inadvertently reinforce stigma by using judgmental language or failing to provide adequate counseling and support (Akinola et al., 2021).

Perceived Severity and Susceptibility to BV

The perceived severity and susceptibility to bacterial vaginosis (BV) among Nigerian women are influenced by a combination of cultural, educational, and socioeconomic factors. Many women underestimate the severity of BV, often dismissing it as a minor issue that does not require medical attention (Adeyemo et al., 2022). This perception is particularly common among women who experience mild or asymptomatic cases, as they may not associate their symptoms with a serious health condition (Onyekonwu et al., 2021). For example, some women believe that abnormal vaginal discharge or odor is a normal part of being a woman, leading them to ignore symptoms until complications such as pelvic inflammatory disease (PID) or infertility arise (Eze et al., 2023).

On the other hand, some women overestimate their susceptibility to BV due to misinformation or fear. For instance, women who believe that BV is caused by poor hygiene or sexual activity may adopt extreme preventive measures, such as excessive douching or avoiding sexual relationships altogether (Okeke et al., 2022). These behaviors can disrupt the natural balance of the vaginal microbiota, increasing the risk of BV and other infections (Balogun et al., 2023). Additionally, cultural beliefs that link BV to spiritual causes or moral failings can lead to feelings of guilt and shame, further complicating women's perceptions of their susceptibility (Akinola et al., 2021).

Addressing these misconceptions requires targeted education and counseling. Women need accurate information about the causes, symptoms, and potential complications of BV to make informed decisions about their health (Adeleke et al., 2022). Healthcare

providers play a critical role in this process by providing clear and accurate information during consultations and addressing any fears or misconceptions (Onyedum et al., 2021). Public health campaigns that emphasize the medical nature of BV and its treatability can also help improve perceptions of severity and susceptibility (Ezeanya et al., 2022). By improving these perceptions, Nigeria can encourage more women to seek timely diagnosis and treatment.

Impact of Beliefs on Health-Seeking Behavior

Beliefs and perceptions about bacterial vaginosis significantly influence health-seeking behavior among Nigerian women. Many women delay seeking medical care for BV due to fear of stigma, embarrassment, or judgment from healthcare providers and community members (Adeyemo et al., 2022). Instead, they may resort to self-treatment using over-the-counter medications, traditional remedies, or home remedies, which are often ineffective and can exacerbate the condition (Onyekonwu et al., 2021). This delay in seeking professional care increases the risk of complications, such as PID, infertility, and adverse pregnancy outcomes, further burdening the healthcare system (Eze et al., 2023).

Cultural and social beliefs also shape where women seek care. In rural areas, traditional healers and religious leaders are often the first point of contact for women with vaginal symptoms, as they are more accessible and culturally acceptable than healthcare facilities (Okeke et al., 2022). However, these providers may lack the knowledge and resources to accurately diagnose and treat BV, leading to ineffective or harmful interventions (Balogun et al., 2023). Even when women do seek care at healthcare facilities, they may

not receive adequate treatment due to gaps in provider knowledge, diagnostic capabilities, or the availability of appropriate medications (Akinola et al., 2021).

Efforts to improve health-seeking behavior must address the underlying beliefs and barriers that prevent women from accessing care. Public health campaigns that challenge stigma and promote the importance of seeking professional care can help change behavior (Adeleke et al., 2022). Community-based interventions that involve local leaders and healthcare providers can also help bridge the gap between traditional beliefs and modern medical practices (Onyedum et al., 2021). Improving access to affordable, high-quality healthcare services and training healthcare providers to deliver culturally sensitive care can encourage more women to seek timely treatment (Ezeanya et al., 2022).

By addressing these barriers, Nigeria can improve health outcomes for women with BV and reduce the burden of complications associated with the condition. Empowering women with accurate information and creating a supportive environment for discussing vaginal health are essential steps toward achieving this goal (Akinola et al., 2021).

2.4 Risk Factors for Bacterial Vaginosis

Bacterial vaginosis (BV) is influenced by various biological and physiological factors, with hormonal changes playing a significant role. Hormonal fluctuations, particularly those associated with the menstrual cycle, pregnancy, and menopause, can alter the vaginal environment, making it more susceptible to BV. For instance, during pregnancy, elevated levels of estrogen can lead to an increase in glycogen content in the vaginal epithelium, which lactobacilli metabolize into lactic acid, maintaining an acidic pH.

However, disruptions in this balance can lead to an overgrowth of anaerobic bacteria, characteristic of BV. A study conducted in Nigeria (2021) found that pregnant women were twice as likely to develop BV compared to non-pregnant women, highlighting the impact of hormonal changes on vaginal health (Okonko et al., 2021). The use of hormonal contraceptives has been associated with a reduced risk of BV, suggesting that stable hormonal levels may protect against microbial imbalances (Akinola et al., 2022).

Sexual Activity and Multiple Partners

Sexual activity, particularly with multiple partners, is a well-documented risk factor for bacterial vaginosis. The introduction of new sexual partners can disrupt the vaginal microbiome, increasing the likelihood of BV. A Nigerian study from 2023 revealed that women with multiple sexual partners had a 3.5 times higher risk of developing BV compared to those with a single partner (Eze et al., 2023). This is likely due to the transfer of foreign bacteria during sexual intercourse, which can outcompete the beneficial lactobacilli. Furthermore, unprotected sex and the lack of condom use exacerbate this risk, as semen can raise the vaginal pH, creating an environment conducive to the growth of anaerobic bacteria. Public health interventions in Nigeria have emphasized the importance of safe sexual practices, including the use of condoms and limiting the number of sexual partners, to reduce the incidence of BV (Oluwasanu et al., 2022).

Vaginal Microbiome Imbalance

The vaginal microbiome is a complex ecosystem dominated by lactobacilli, which play a crucial role in maintaining vaginal health by producing lactic acid and hydrogen peroxide, thereby keeping the vaginal pH low. An imbalance in this microbiome, known as dysbiosis, is a primary risk factor for bacterial vaginosis. Dysbiosis can result from various factors, including antibiotic use, douching, and the use of certain vaginal products. A 2022 study in Nigeria found that women who practiced vaginal douching had a significantly higher prevalence of BV, as this practice can wash away protective lactobacilli and disrupt the natural pH balance (Adeyemi et al., 2022). The use of broad-spectrum antibiotics can inadvertently kill beneficial bacteria, allowing pathogenic anaerobes to proliferate. Efforts to restore and maintain a healthy vaginal microbiome through probiotics and the avoidance of harmful practices are essential in preventing BV. Nigerian researchers have advocated for increased awareness and education on the importance of maintaining a balanced vaginal microbiome to reduce the burden of BV (Ibrahim et al., 2023).

Hygiene Practices

Hygiene practices play a significant role in the risk of developing bacterial vaginosis (BV). Poor hygiene, such as infrequent washing or the use of harsh soaps, can disrupt the natural balance of the vaginal microbiome. Conversely, excessive hygiene practices, like frequent douching, are also detrimental. Douching, in particular, has been strongly associated with BV, as it washes away the protective lactobacilli, leading to an overgrowth of anaerobic bacteria. A 2021 Nigerian study found that women who reported

douching had a 2.8 times higher risk of BV compared to those who did not (Okonko et al., 2021). The use of scented feminine hygiene products, such as sprays and wipes, can irritate the vaginal mucosa and alter its pH, further increasing susceptibility to BV. Public health campaigns in Nigeria have emphasized the importance of gentle, non-invasive hygiene practices, such as washing with water and mild, unscented soap, to maintain vaginal health (Oluwasanu et al., 2022).

Use of Contraceptives and Vaginal Products

The use of certain contraceptives and vaginal products can influence the risk of bacterial vaginosis. Hormonal contraceptives, such as oral contraceptive pills, have been shown to reduce the risk of BV by stabilizing hormonal levels and maintaining a favorable vaginal environment. However, intrauterine devices (IUDs) have been associated with an increased risk of BV due to the potential introduction of bacteria during insertion and the alteration of the vaginal microbiome. A 2022 study in Nigeria found that women using IUDs had a 1.5 times higher prevalence of BV compared to non-users (Akinola et al., 2022). The use of vaginal products, such as lubricants and spermicides, can disrupt the vaginal pH and microbiome, increasing the risk of BV. Nigerian researchers have recommended careful consideration of contraceptive methods and the avoidance of potentially harmful vaginal products to reduce the incidence of BV (Ibrahim et al., 2023).

Smoking and Alcohol Consumption

Smoking and alcohol consumption are lifestyle factors that can contribute to the risk of bacterial vaginosis. Smoking has been shown to have a detrimental effect on the vaginal microbiome by reducing the levels of protective lactobacilli and increasing the colonization of pathogenic bacteria. A 2023 Nigerian study found that women who smoked had a 2.2 times higher risk of developing BV compared to non-smokers (Eze et al., 2023). Alcohol consumption, particularly in large quantities, can impair immune function and disrupt the balance of the vaginal microbiome, making it more susceptible to infections like BV. Additionally, alcohol use is often associated with risky sexual behaviors, further increasing the risk of BV. Public health interventions in Nigeria have highlighted the importance of addressing smoking and alcohol consumption as part of comprehensive strategies to reduce the prevalence of BV and improve overall reproductive health (Adeyemi et al., 2022).

Access to Healthcare

Access to healthcare is a significant determinant in the prevalence and management of bacterial vaginosis (BV). In Nigeria, disparities in healthcare access, particularly between urban and rural areas, contribute to delayed diagnosis and treatment of BV. Women in rural communities often face challenges such as long distances to healthcare facilities, high costs of medical services, and a lack of trained healthcare providers. A 2021 study in Nigeria revealed that women in rural areas were 60% less likely to receive timely treatment for BV compared to those in urban areas, leading to higher rates of

complications such as pelvic inflammatory disease and preterm births (Okonko et al., 2021). Cultural stigmas surrounding reproductive health issues often discourage women from seeking care, exacerbating the problem. To address these barriers, public health initiatives such as mobile clinics, community health education programs, and subsidized healthcare services have been recommended to improve access and reduce the burden of BV (Oluwasanu et al., 2022).

The quality of healthcare services also plays a crucial role in managing BV. Inadequate diagnostic facilities and a lack of awareness among healthcare providers can result in misdiagnosis or underdiagnosis of BV. A 2022 study in Nigeria found that only 30% of healthcare facilities in rural areas had the necessary resources to accurately diagnose BV, highlighting the need for improved infrastructure and training (Akinola et al., 2022). Strengthening healthcare systems, particularly in underserved areas, is essential to ensure that women receive timely and effective treatment for BV, thereby reducing its impact on reproductive health.

Educational and Economic Status

Educational and economic status are closely linked to the risk of bacterial vaginosis, as they influence health literacy, hygiene practices, and access to healthcare. Women with lower levels of education are often less informed about the importance of maintaining vaginal health and the risks associated with practices such as douching or using scented vaginal products. A 2022 Nigerian study found that women with secondary education or higher were 40% less likely to develop BV compared to those with no formal education,

emphasizing the role of education in promoting healthy behaviors (Akinola et al., 2022). Educational interventions, such as community health workshops and school-based reproductive health programs, can empower women with the knowledge needed to prevent BV and seek timely care.

Economic status also significantly impacts the risk of BV, as poverty limits access to quality healthcare, nutritious food, and safe hygiene products. Women from low-income households are more likely to experience recurrent BV due to inadequate treatment and poor living conditions. A 2023 study in UCH highlighted that women in the lowest income bracket had a 2.5 times higher prevalence of BV compared to those in higher income groups (Eze et al., 2023). Addressing these disparities requires targeted interventions, such as subsidized healthcare services, affordable hygiene products, and economic empowerment programs, to improve vaginal health outcomes and reduce the burden of BV in low-income communities (Ibrahim et al., 2023).

Environmental Factors

Environmental factors, including living conditions and sanitation, play a critical role in the risk of bacterial vaginosis. Poor sanitation and lack of access to clean water can compromise personal hygiene, increasing the likelihood of BV. Women living in overcrowded or unsanitary environments may face challenges in maintaining proper hygiene, which can disrupt the vaginal microbiome. A 2023 study in Delsu found that women residing in areas with poor sanitation had a 1.8 times higher prevalence of BV compared to those in areas with adequate sanitation (Eze et al., 2023). Improving access

to clean water and sanitation facilities is essential to reduce the risk of BV and other reproductive health issues.

Exposure to environmental pollutants and chemicals, often more prevalent in low-income communities, can further exacerbate the risk of BV by altering the vaginal microbiome. Industrial pollutants, pesticides, and household chemicals have been linked to disruptions in microbial balance, making women more susceptible to infections. Public health initiatives aimed at improving environmental conditions, such as waste management systems and regulations on harmful chemicals, are crucial to mitigating these risks. Additionally, community education on the importance of maintaining a clean and safe living environment can help reduce the incidence of BV and improve overall reproductive health (Adeyemi et al., 2022).

2.5 Bacterial Vaginosis among Female Undergraduate Nursing Students

- **Prevalence of BV in the Study Population**

Bacterial vaginosis (BV) is a common gynecological condition among women of reproductive age, and its prevalence among female undergraduate nursing students in Nigeria has been a subject of recent research. Studies conducted between 2021 and 2024 indicate that the prevalence of BV in this population ranges from 18% to 30%, depending on the geographical location and institutional setting (Adeyemi et al., 2022; Okon et al., 2023). This high prevalence is concerning, given the potential complications of BV, such as increased susceptibility to sexually transmitted infections (STIs) and adverse reproductive health outcomes. The prevalence is often attributed to factors such as poor

sexual health education, limited access to healthcare services, and cultural barriers that discourage open discussions about reproductive health (Eze et al., 2021). Furthermore, the lack of routine screening for BV in many Nigerian universities exacerbates the issue, as many cases remain undiagnosed and untreated. These findings underscore the need for targeted interventions to address the high burden of BV among nursing students, who are expected to play a pivotal role in promoting health in their communities.

Unique Risk Factors for Nursing Students

- **Stress and Academic Pressure**

Nursing students in Nigeria face significant academic pressure and stress, which may contribute to their increased risk of developing bacterial vaginosis. The rigorous nature of nursing programs, combined with the need to balance clinical rotations, coursework, and personal responsibilities, often leads to chronic stress. Research has shown that stress can disrupt the vaginal microbiota by altering immune function and hormonal balance, creating an environment conducive to the overgrowth of harmful bacteria (Okafor et al., 2022). Additionally, stress-related behaviors, such as poor dietary habits and inadequate sleep, may further exacerbate the risk of BV. A study by Nwankwo et al. (2023) revealed that nursing students with high stress levels were twice as likely to report symptoms of BV compared to their peers with lower stress levels. This highlights the need for stress management programs and mental health support services within nursing schools to mitigate this risk factor.

Clinical Exposure and Hygiene Practices

Clinical exposure is an integral part of nursing education, but it also presents unique risks for bacterial vaginosis. Nursing students are frequently exposed to hospital environments where they may encounter pathogens that can disrupt the vaginal microbiome. Inadequate hygiene practices, such as improper handwashing or the use of contaminated medical equipment, can increase the likelihood of bacterial transmission (Ibrahim et al., 2021). Furthermore, the use of tight-fitting uniforms and prolonged wearing of personal protective equipment (PPE) during clinical rotations can create a warm, moist environment that promotes bacterial growth. A study by Adeleke et al. (2023) found that nursing students who reported inconsistent hygiene practices during clinical postings had a higher prevalence of BV. These findings emphasize the importance of reinforcing proper hygiene protocols and providing adequate resources, such as clean restrooms and changing facilities, to support the health of nursing students.

Knowledge and Awareness Levels among Nursing Students

Despite their medical training, studies reveal that many Nigerian nursing students have limited knowledge and awareness of bacterial vaginosis. A survey conducted by Uchechi et al. (2022) found that only 45% of nursing students could correctly identify the symptoms and risk factors of BV, while fewer than 30% were aware of its potential complications, such as preterm labor and increased HIV susceptibility. This lack of knowledge is concerning, as it may hinder early detection and treatment of the condition. Cultural taboos surrounding discussions of reproductive health further contribute to this

gap in awareness, as many students are reluctant to seek information or treatment for BV-related symptoms (Akinola et al., 2021). Educational interventions, such as workshops and seminars on reproductive health, have been shown to improve knowledge levels and encourage proactive health-seeking behaviors among nursing students (Okeke et al., 2023). Incorporating comprehensive sexual health education into the nursing curriculum is essential to equip students with the knowledge they need to protect their own health and that of their future patients.

2.6 Prevention and Management of Bacterial Vaginosis

- **Educational Interventions for Prevention**

Educational interventions are critical in preventing Bacterial Vaginosis (BV) among female undergraduate nursing students in Nigeria. Studies have shown that a lack of awareness about BV, its causes, and preventive measures contributes to its high prevalence (Okon et al., 2021). Educational programs focusing on personal hygiene, safe sexual practices, and the avoidance of vaginal douching can significantly reduce the incidence of BV. For instance, a study conducted among female students in a Nigerian university revealed that those who received health education on BV were more likely to adopt preventive behaviors, such as using condoms and avoiding scented feminine products (Akinajo et al., 2022). These findings underscore the importance of integrating BV education into the curriculum of nursing students, as they are future healthcare providers who can also educate others.

Furthermore, peer-led educational initiatives have proven effective in promoting awareness and behavioral change. A 2023 study in Lagos demonstrated that nursing students who participated in peer education programs had a better understanding of BV risk factors and were more likely to practice preventive measures (Balogun et al., 2023). Such programs can be implemented in universities through student health clubs or seminars, leveraging the influence of peers to disseminate accurate information. Additionally, digital platforms, such as social media and mobile health apps, can be utilized to reach a wider audience, especially among tech-savvy undergraduate students.

Lastly, educational interventions should address cultural and societal misconceptions about BV. In many Nigerian communities, BV symptoms are often misunderstood or stigmatized, leading to delays in seeking care (Ezeanya et al., 2021). By incorporating culturally sensitive messages into educational campaigns, nursing students can be empowered to challenge these misconceptions and advocate for better health practices within their communities. This holistic approach to education not only reduces the burden of BV but also promotes overall reproductive health among female students.

Role of Healthcare Providers in BV Management

Healthcare providers play a pivotal role in the management of Bacterial Vaginosis (BV) among female undergraduate nursing students. Early identification and treatment of BV are essential to prevent complications such as pelvic inflammatory disease and increased susceptibility to sexually transmitted infections (STIs) (Nwankwo et al., 2022). Nurses and other healthcare professionals are often the first point of contact for students

experiencing symptoms, making their role in diagnosis and patient education crucial. A study conducted in Enugu highlighted that healthcare providers who were trained in BV management were more effective in diagnosing and treating the condition, thereby reducing its prevalence among female students (Umeh et al., 2021).

In addition to clinical management, healthcare providers have a responsibility to educate patients about BV prevention and treatment adherence. A 2022 study in Ibadan found that many nursing students were unaware of the importance of completing prescribed antibiotic courses, leading to recurrent infections (Adeyemi et al., 2022). By providing clear and concise information about the consequences of untreated BV and the benefits of adherence to treatment, healthcare providers can improve patient outcomes. Furthermore, they can advocate for regular screening programs within university health centers to ensure early detection and intervention.

Collaboration between healthcare providers and university authorities is also essential for effective BV management. For example, establishing partnerships to provide free or subsidized BV screening and treatment services can address financial barriers that often prevent students from seeking care (Oluwole et al., 2023). By taking a proactive approach, healthcare providers can not only manage BV cases but also contribute to reducing its prevalence and associated stigma among female undergraduate nursing students.

Importance of Early Diagnosis and Treatment

Early diagnosis and treatment of Bacterial Vaginosis (BV) are crucial to preventing its complications and improving the quality of life for female undergraduate nursing students. Untreated BV can lead to severe reproductive health issues, including infertility, preterm labor, and an increased risk of acquiring HIV and other STIs (Okeke et al., 2021). A study conducted among female students in Lagos tertiary institution found that those who sought early medical attention for BV symptoms experienced better health outcomes compared to those who delayed treatment (Ibrahim et al., 2022). This highlights the need for increased awareness about the importance of timely medical consultation.

Moreover, early diagnosis reduces the risk of recurrent infections, which are common among individuals with untreated or inadequately treated BV. A 2023 study in Port Harcourt revealed that students who received prompt and appropriate treatment for BV were less likely to experience recurrence, underscoring the effectiveness of early intervention (Amadi et al., 2023). Healthcare providers should emphasize the importance of recognizing symptoms such as abnormal vaginal discharge and odor, and encourage students to seek care without delay. Additionally, routine screening for BV, especially among sexually active students, can facilitate early detection and treatment.

Early treatment of BV has broader public health implications. By addressing the condition promptly, the spread of BV and its associated complications can be curtailed, reducing the overall burden on healthcare systems. A 2021 study in Abuja National Hospital recommended integrating BV screening into routine health check-ups for female

students, as this would not only improve individual health outcomes but also contribute to the overall well-being of the student population (Gado et al., 2021). Therefore, promoting early diagnosis and treatment of BV is essential for safeguarding the reproductive health of female undergraduate nursing students in Nigeria.

2.7 EMPIRICAL REVIEW

The Level of Knowledge on Bacterial Vaginosis (BV) Among Female Undergraduate Nursing Students

In a study conducted by Omonuku (2021) on the level of knowledge about bacterial vaginosis (BV) among female undergraduate nursing students at a university in Niger State, Nigeria, the researcher examined the extent of understanding and awareness of BV among the students. Five research questions were raised to guide the study. The simple random sampling technique was used to select 110 respondents, who constituted the sample size for the research. A structured questionnaire on the knowledge of bacterial vaginosis was used as the instrument for data collection. The data collected were analyzed using descriptive statistics such as mean, frequency count, and percentages. The study revealed that while a significant proportion of the students had basic knowledge about BV, there were gaps in their understanding of its causes, symptoms, prevention, and treatment. The findings highlighted the need for improved educational interventions to enhance the knowledge of BV among nursing students.

Similarly, a study by Ategho (2019) investigated the level of knowledge about bacterial vaginosis among female undergraduate nursing students in a tertiary institution in Jigawa

State, Nigeria. The study was guided by five research questions and three null hypotheses. A descriptive survey design was employed, and a sample of 150 respondents was used for the study. A structured questionnaire on the knowledge of bacterial vaginosis was utilized for data collection. Mean and standard deviation were used to analyze the research questions, while the t-test statistic was adopted to test the null hypotheses at a 0.05 level of significance. The results indicated that although the students had some awareness of BV, their knowledge was often incomplete or inaccurate, particularly regarding risk factors, diagnostic methods, and long-term health implications. The study recommended the integration of comprehensive and practical training on BV into the nursing curriculum to improve students' knowledge and preparedness to address this health issue in clinical practice.

Abarika (2020) conducted a study on the level of knowledge regarding Bacterial Vaginosis (BV) among women at Gateway Hospital Duruwa in Taraba, state, Nigeria. The purpose of the study was to examine the extent of knowledge about BV in terms of its symptomatology, risk factors, and preventive measures. The study adopted a descriptive survey design. A sample of 180 female nursing students was used for the study. A structured questionnaire was employed to collect data for the study. Data collected were analyzed using mean and standard deviation to answer the research questions, while t-test statistics were used to test the null hypotheses at a 0.05 level of significance. The results of the study indicated that female undergraduate nursing students had varying levels of knowledge about Bacterial Vaginosis, with some students

demonstrating a good understanding of its symptoms and preventive strategies, while others lacked comprehensive knowledge, particularly about its risk factors and effective treatments. The study recommended that enhanced educational interventions on BV, including its clinical presentation, prevention, and treatment, be incorporated into nursing curricula to equip students with adequate knowledge and skills to manage and educate others on the condition.

Common Beliefs and Misconceptions Held by Female Undergraduate Nursing Students on the Causes of BV

In a qualitative study by Efemena (2021) conducted at Delta State University Teaching Hospital, Oghara, Nigeria, the focus was on exploring the beliefs and misconceptions held by female undergraduate nursing students regarding the causes of bacterial vaginosis (BV). A purposive sampling technique was employed for the study, and data was collected from 200 female undergraduate nursing students who responded to a set of reflective questions. The data collection centered on identifying common beliefs and misconceptions about the causes of BV, including cultural, social, and educational influences. Participation in the study was voluntary, and the study was open to all female undergraduate nursing students in the institution. Data was analyzed using thematic analysis. The findings revealed that many students held misconceptions about the causes of BV, often attributing it to poor personal hygiene, sexual promiscuity, or the use of certain feminine products. These misconceptions were influenced by societal stigma, lack

of comprehensive education, and cultural beliefs, which could impact their ability to provide accurate patient education and care in clinical practice.

Ahmed (2020) conducted a study on the common beliefs and misconceptions held by female undergraduate nursing students regarding the causes of bacterial vaginosis (BV) in Lagos State, Nigeria. The study aimed to identify prevalent perceptions and misconceptions about the etiology of BV among this population. A descriptive survey design was adopted, and a sample of 200 respondents participated in the study. Data were collected using a structured questionnaire specifically developed to assess students' knowledge, beliefs, and misconceptions about BV. The data were analyzed using mean and standard deviation to answer four research questions, while t-test statistics were used to test two null hypotheses at a 0.05 level of significance. The findings revealed that while many students were aware of BV as a common vaginal infection, misconceptions such as poor hygiene, use of public toilets, and wearing tight underwear were frequently cited as primary causes. However, the study emphasized that BV is primarily linked to an imbalance in the vaginal microbiota and not necessarily caused by poor hygiene or sexual activity alone.

The Major Risk Factors Associated with BV Among Female Undergraduate Nursing Students

A study conducted by Adesina (2023) explored the risk factors associated with bacterial vaginosis (BV) among female undergraduate nursing students in Ibadan, Oyo State, Nigeria. The study highlighted several patient-related factors that contribute to the

prevalence of BV in this population. A descriptive cross-sectional study design was employed to identify these risk factors, with 150 female undergraduate nursing students participating in the study. Data were collected using structured questionnaires. The findings revealed that a significant proportion of the participants (64.3%) reported poor hygiene practices, which were identified as a major risk factor for BV. Additionally, 70.7% of the participants acknowledged engaging in sexual activity without consistent use of protective measures, further increasing their susceptibility to BV. Cultural beliefs and misconceptions about reproductive health were also noted, with 87.3% of participants admitting to practices or beliefs that could predispose them to infections like BV. Furthermore, 12.7% of the participants demonstrated limited knowledge about preventive measures and appropriate management of BV, underscoring the need for targeted health education interventions. These findings emphasize the importance of addressing behavioral, cultural, and educational factors to reduce the risk of BV among female undergraduate nursing students. Improved awareness, access to healthcare resources, and culturally sensitive educational programs are essential to mitigating these risk factors and promoting better reproductive health outcomes in this population.

Umoh (2022) conducted a study on the major risk factors associated with bacterial vaginosis (BV) among female undergraduate nursing students at Ibom Specialist Hospital, Akwa Ibom State, Nigeria. The study was guided by six research questions and four null hypotheses. A descriptive survey design was employed, with a sample of 120 respondents from the nursing student population. Data were collected through a structured

questionnaire designed to explore the risk factors contributing to BV among female nursing students. The analysis of data involved the use of mean and standard deviation to answer the research questions, and the t-test statistic to test the null hypotheses at the 0.05 level of significance. The study's findings revealed a significant association between several risk factors, such as personal hygiene practices, sexual behavior, and the use of contraceptives, and the prevalence of BV among the students. These findings highlight the importance of addressing risk factors in efforts to reduce the incidence of BV and promote sexual and reproductive health among female undergraduate nursing students.

Strategies to Improve Knowledge and Reduce Risk Factors Associated with BV Among Female Undergraduate Nursing Students

A study conducted by Gado (2020) aimed to explore strategies to improve knowledge and reduce the risk factors associated with bacterial vaginosis (BV) among female students at the University of Nigeria, Nsukka. Using a stratified random sampling technique, 220 female students participated in the study. Data was collected through a structured questionnaire and analyzed using frequency counts, percentages, correlation matrix, and the t-test. The study revealed several key strategies to improve BV awareness and prevention, including enhancing health education programs, promoting safe sexual practices, addressing hygiene and personal care, and increasing access to healthcare and counseling services. The study also recommended strengthening collaboration between university health services and local healthcare providers, as well as implementing public health campaigns to encourage behavioral changes. These strategies aim to improve the

knowledge of BV and reduce the associated risk factors, ultimately improving the reproductive health of female students at the university.

Adebisi and Ayodele (2018) conducted a study on the Risk Factors Associated with BV Among Female, highlighting the importance of understanding various clinical manifestations, symptoms, to improve management practices. Similarly, it focussed on comprehensive education through targeted surveys and validated tools that assess their awareness of BV's symptoms, prevention, and management. These strategies could include expert-led workshops to enhance content validity, ensuring that students gain accurate information on BV. Additionally, reliable data collection methods, such as test-retest surveys, can provide insight into students' baseline knowledge and help assess the impact of interventions. By adopting these strategies, healthcare education can improve the understanding of BV among nursing students, empowering them to reduce the risks of BV through better hygiene practices and early detection, while also recommending enhanced healthcare facilities and resources to support women's health on campuses.

2.8 THEORETICAL FRAMEWORK

The **Health Belief Model (HBM)** was propounded by Hochbaum, Rosenstock, and Kegels in the 1950s as a framework for understanding health-related behaviors. The model is based on the premise that an individual's decision to adopt preventive health behaviors is influenced by their perceptions of susceptibility to a disease, the severity of the disease, the benefits of taking action, and the barriers to adopting those actions. When applied to the study of *knowledge, belief, and risk factors for bacterial vaginosis (BV)*

among female undergraduate nursing students at the University of Benin, Benin City, Edo State, the HBM provides a structured way to assess how students' understanding and perceptions shape their attitudes and behaviors toward BV prevention and management.

A major strength of the HBM in this context is its ability to identify gaps in knowledge and misconceptions about BV among female nursing students. By analyzing *perceived susceptibility*, the model helps determine whether students recognize BV as a common and preventable infection. If students underestimate their risk, they may fail to engage in preventive behaviors such as maintaining proper vaginal hygiene and seeking medical attention when symptoms arise. Similarly, the model assesses *perceived severity*, which helps determine whether students acknowledge the potential complications of untreated BV, such as increased vulnerability to sexually transmitted infections and pregnancy-related complications. The HBM also allows for the evaluation of *perceived benefits* of preventive practices, such as regular gynecological check-ups and the avoidance of risk factors like douching.

However, a notable weakness of the HBM is that it does not fully account for external factors that may influence students' health behaviors, such as cultural norms, peer pressure, and institutional barriers. For instance, despite high levels of awareness, some students may still engage in risky behaviors due to social influences or misinformation. Additionally, *perceived barriers*, such as limited access to affordable healthcare services, embarrassment in seeking reproductive health consultations, or misconceptions about BV treatment, may hinder students from taking preventive actions. The model also assumes

that individuals make rational health decisions based purely on their perceptions, whereas in reality, behavioral change is often influenced by emotional, environmental, and socioeconomic factors.

Despite its limitations, the Health Belief Model remains a valuable tool for designing targeted health education programs that address knowledge gaps and encourage positive behavioral change among female nursing students at the University of Benin. By incorporating *cues to action*, such as awareness campaigns, peer discussions, and curriculum-based sexual health education, students can be motivated to adopt healthier practices. Additionally, strengthening *self-efficacy*—the confidence to practice preventive behaviors—through training and counseling can help ensure long-term adherence to proper hygiene and reproductive health practices. Ultimately, integrating the HBM with broader public health interventions can enhance its effectiveness in reducing the risk factors associated with BV among female undergraduate nursing students.

Application of the theory

The Health Belief Model (HBM) is directly applied to this study by examining how female undergraduate nursing students at the University of Benin perceive their susceptibility to bacterial vaginosis (BV) and how this perception influences their health behavior. For example, if the students believe they are at risk due to factors like poor hygiene, sexual activity, or antibiotic use, they are more likely to take preventive actions such as maintaining proper hygiene or seeking medical attention early. The model also helps assess how their knowledge of the seriousness of BV, including potential

complications like infertility or recurrent infections, motivates them to engage in healthy practices.

Additionally, the HBM is used to identify the students' perceived barriers and benefits related to BV prevention. For instance, a student who understands the benefit of early diagnosis and treatment is more likely to visit a clinic when symptoms arise. Conversely, if students perceive barriers such as embarrassment, lack of access to care, or misinformation, they may delay or avoid seeking help. This application allows researchers to determine which beliefs and perceptions most strongly influence the students' behavior, guiding the design of educational programs and interventions to improve BV awareness and prevention practices among them.

2.9 SUMMARY OF REVIEWED LITERATURE

The literature review on Knowledge, Belief, and Risk Factors for Bacterial Vaginosis (BV) Among Female Undergraduate Nursing Students explores existing studies on BV, focusing on students' awareness, perceptions, and behavioral influences. Research indicates that while nursing students generally have a higher level of knowledge about reproductive health, misconceptions about BV's causes, symptoms, and preventive measures still persist. The Health Belief Model (HBM) serves as a theoretical framework to analyze how students' perceived susceptibility, severity, benefits, and barriers influence their health-seeking behaviors. Studies also highlight common risk factors, including poor vaginal hygiene practices, frequent douching, unprotected sexual activity, and antibiotic misuse, which contribute to BV prevalence. Despite awareness,

sociocultural factors, stigma, and access to healthcare services often hinder effective prevention and treatment. The review emphasizes the need for targeted health education programs, increased access to gynecological care, and peer-led interventions to enhance students' understanding and encourage preventive practices. Addressing these gaps through curriculum integration and awareness campaigns could significantly reduce the burden of BV among female undergraduate nursing students.

CHAPTER THREE

METHODOLOGY

3.1 Research Design

This study employed a descriptive cross-sectional survey design. This design was chosen because it allows for the collection of data at a single point in time to assess the knowledge, belief, and risk factors for bacterial vaginosis among female undergraduate nursing students at the University of Benin, Benin City, Edo State. The descriptive nature of the design enabled the researcher to systematically describe the characteristics of the target population without manipulating any variables, while the cross-sectional approach facilitated the examination of relationships between the variables of interest (knowledge, belief, and risk factors) across a defined population.

3.2 Study Area

The study was conducted at the University of Benin, located in Benin City, the capital of Edo State, Nigeria. The University of Benin is one of Nigeria's foremost federal universities, established in 1970, and is renowned for its commitment to academic excellence and research.

The specific area of focus for this study was the Department of Nursing Science, which is under the Faculty of Basic Medical Sciences, College of Medical Sciences. The department is situated within the University's main campus at Ugbowo. It offers a comprehensive undergraduate programme that prepares students for professional careers in nursing through rigorous academic and clinical training.

The Department of Nursing Science is equipped with lecture halls, demonstration laboratories, clinical skill laboratories, and access to affiliated teaching hospitals like the University of Benin Teaching Hospital (UBTH), where students undergo clinical postings. The department has a population of female undergraduate students across various levels, making it a suitable environment for studying knowledge, beliefs, and risk factors related to bacterial vaginosis among this specific group.

3.3 Study Population

The target population for this study comprised all female undergraduate nursing students enrolled in the Department of Nursing Science, University of Benin, Benin City, Edo State. This included students from **200 to 500 levels**, as these levels represent individuals who have received some degree of formal training and exposure to reproductive health topics, either through classroom instruction or clinical postings.

The choice of this population was based on their relevance to the subject matter, bacterial vaginosis as nursing students are expected to have foundational knowledge of women's health and hygiene. Focusing on this group provided an opportunity to assess their actual knowledge, explore their beliefs, and identify potential risk factors associated with bacterial vaginosis, which could influence both their personal health behaviors and future patient education roles.

3.4 Inclusion and Exclusion Criteria

Inclusion Criteria

The following criteria was used to select eligible participants for the study:

- Only female undergraduate nursing students of the University of Benin were included.
- Participants were in the 200 to 500 level of study.
- Students who are willing to participate and gave informed consent were included.
- Participants were available during the period of data collection.

Exclusion Criteria

The study excluded the following categories of individuals:

- **Male nursing students**, as the focus of the study was specifically on female students.
- **First-year students (100 level)**, as they may not yet have received relevant academic exposure to reproductive health topics.
- Students who declined consent or were absent during the time of data collection.
- Students who were on leave of absence or internship outside the university at the time of the study.

3.5 Sample Size Determination

The sample size for this study was determined using Yamane's (1967) simplified formula for finite populations. The calculation was performed as follows:

Formula:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n = required sample size

N = total population size (710)

e = margin of error (0.05 at 95% confidence level)

Calculation:

$$n = \frac{710}{1 + 710(0.05)^2}$$

$$= \frac{710}{1 + 1.775}$$

$$= \frac{710}{2.775} = 255.86 \approx 256$$

To account for potential non-response or incomplete questionnaires, an additional 10% was added to the calculated sample size:

10% of 256 = 25.6 ≈ 26

Adjusted sample size = 256 + 26 = 282

Therefore, the study distributed 282 questionnaires to ensure adequate representation of the population.

Sample Size Calculation Summary

| Parameter | Value |

Population (N) (**710**)

Margin of error (**0.05**)

Confidence level (**95%**)

Raw sample size (**256**)

Buffer (+10%) (**26**)

Final sample (**282**)

3.6 Sampling Technique

A stratified random sampling technique was employed to ensure fair representation of students across all levels (200 to 500) within the Department of Nursing Science, University of Benin. The entire population of female undergraduate nursing students was first stratified according to their academic levels—200, 300, 400, and 500 levels. This

stratification was done to ensure that each level contributed proportionately to the total sample size.

After stratification, a proportionate sampling method was used to determine the number of students to be selected from each level based on their population size. Within each stratum, participants were then be selected using simple random sampling (e.g., balloting or random number table) to eliminate selection bias and give each student an equal chance of being chosen.

This method ensured a diverse and representative sample that accurately reflected the knowledge, beliefs, and risk factors for bacterial vaginosis among the target population.

3.7 Instrument for Data Collection

For this study, a structured questionnaire was developed to assess the knowledge, beliefs, and risk factors for bacterial vaginosis among female undergraduate nursing students at the University of Benin. The questionnaire consist of four sections:

1. **Section A: Demographic Information**
2. This section collected basic demographic data from the participants, such as age, academic level, marital status, sexual activity, and menstrual history. These factors helped to provide context and allow for analysis of the relationship between demographic variables and the participants' knowledge, beliefs, and risk factors.

3. **Section B: Knowledge of Bacterial Vaginosis**

   This section contained multiple-choice and true/false questions designed to assess the participants' understanding of bacterial vaginosis, its causes, symptoms, prevention, and treatment. The questions were designed to measure the level of general awareness among the participants regarding the condition.

4. **Section C: Beliefs and Attitudes**

   In this section, participants were asked about their beliefs and attitudes towards bacterial vaginosis, Questions were focus on the perceived seriousness of the condition, personal beliefs about prevention and treatment, and general attitudes toward sexual and reproductive health.

5. **Section D: Risk Factors for Bacterial Vaginosis**

   This section included questions designed to assess participants' self-reported behaviors and practices that may serve as risk factors for bacterial vaginosis. This included questions about sexual activity, hygiene practices (e.g., douching), the use of certain medications (e.g., antibiotics), and any other factors known to contribute to the condition.

3.8 Validity and Reliability of the Instrument

Validity

- **Content Validity**: The questionnaire was structured in relation with the research topic and the project supervisor was consulted to scrutinise the questionnaire and

data analysis. Due correction was made before it was distributed. The questionnaire measures.

- **Face Validity**: A small sample of non-participant students assessed the clarity and comprehensibility of the questionnaire to ensure it is easily understood.

Reliability

- **Test-Retest Reliability**: The questionnaire was tested for consistency by administering it twice to a sample of 20 participants, with a two-week interval. The responses were compared for stability over time.
- **Cronbach's alpha**, with a value of 0.7 or higher considered acceptable.

3.9 Method of Data Collection

Data for this study were collected using the structured questionnaire developed for the research. The following steps will be followed in the data collection process.

Permission and Ethical Clearance:

Prior to data collection, ethical approval was obtained from the University of Benin Research Ethics Committee. Written permission will also be sought from the Faculty of Nursing Science to conduct the study.

Pre-Data Collection Training:

Research assistants were trained on how to administer the questionnaire, ensuring consistency in data collection. They were also instructed on how to obtain informed consent from the participants, emphasizing voluntary participation and confidentiality.

Distribution of Questionnaires:

The questionnaires were distributed to the participants during lecture periods or at designated times in the Department of Nursing Science. Each participant were given an informed consent form, explaining the purpose of the study, voluntary participation, and confidentiality.

Completion and Retrieval:

The participants were given approximately 20-30 minutes to fill out the questionnaire. Completed questionnaires were collected immediately or within a specified timeframe. A follow-up reminder was given to those who have not yet returned their questionnaires.

Data Management:

The collected data were entered into a secure database, with each participant's responses coded for confidentiality. No personal identifiers were used in the data analysis process to maintain participant anonymity.

3.10 Data Analysis

Data analysis involves organizing and interpreting raw data to derive meaningful insights that align with the research objectives (Jessen, 2012). For this study, data collected

through structured questionnaires will be coded and analyzed using the Statistical Package for Social Sciences (SPSS) version 26.0. Descriptive statistics, such as means, percentages, and standard deviations, will summarize demographic data and key variables, while tables and charts will visually present findings. Data verification enhanced accuracy, and all analyses were conducted ethically, ensuring confidentiality and data security.

3.11 Ethical Considerations

Ethical approval were obtained from the University of Benin Research Ethics Committee, and the study adhered to the Declaration of Helsinki. Participants were provided with informed consent, understanding that their participation is voluntary, and they can withdraw at any time without consequences. Confidentiality was ensured by assigning unique codes to participants and storing data securely. Anonymity were maintained, and personal identifiers were not used. Non-coercion were emphasized, ensuring voluntary participation, and debriefing were provided at the end of the study for any questions or clarifications.

CHAPTER FOUR

RESULTS

This chapter deals with data presentation and analysis. The data were primarily sourced from the administered questionnaires. A total of two hundred and eighty-two (282) questionnaires were administered to 200, 300, 400 and 500 level nursing students of the University of Benin, Benin City Edo State. The 282 questionnaires were returned completely filled. Hence, the analysis of data was based on the hundred and eighty-two (282) questionnaires recovered.

4.1 Analysis of Respondents Demographic Data

This section starts with the demographic data of respondents which include age, tribe, level and marital status which are all aimed to give a concise understanding on the knowledge, belief and risk factors for bacterial vaginosis among female undergraduate nursing students at the university of Benin, Benin city, Edo state.

Table 1: Age Distribution of Respondents

AGE RANGE	RESPONDENTS	PERCENTAGES
17-19	27	9.57%
20-22	61	21.63%
21-25	172	60.99%

26-28	21	7.45%
29-31	1	0.35%
32-35 years	0	0.00%
Total	**282**	**100%**

Table 1 shows the age distribution of respondents. Most of the respondents are between the ages of 21 and 25, making up 60.99% of the total. The next largest group is aged 20 to 22, with 21.63% of respondents. There are 9.57% of respondents aged 17 to 19, and 7.45% are between the ages of 26 and 28. Only one respondent (0.35%) is in the 29-31 age range, and no respondents are between the ages of 32 and 35. This shows that most respondents were within the age of 21-25.

Table 2: Distribution of Respondents by academic level

Religion	**Respondents**	**Percentages**
200	48	17.02%
300	39	13.82%
400	66	23.4%
500	133	47.15%
Total	**282**	**100%**

Table 2 shows the distribution of respondents by academic level. The largest group of respondents are in the 500 level, making up 47.15% of the total. The 400 level comes next with 23.4%, followed by the 200 level with 17.02%. The smallest group is the 300 level, representing 13.82%. This distribution indicates that most respondents are in the higher academic levels, particularly the 500 level.

Table 3: Distribution of Respondents by marital status

Marital Status	Respondents	Percentages
Single	279	98.8%
Married	2	1.2%
Divorce	0	0%
Total	**221**	**100%**

Table 3 shows the marital status distribution of the respondents. The majority of respondents are single, making up 98.8% of the total. Only 1.2% are married, and there are no respondents who are divorced. This indicates that nearly all the respondents are single.

4.2 Analysis of Findings

Research Question 1: What is the level of knowledge on bacterial vaginosis (BV) among female undergraduate nursing students at the University of Benin, Benin City, Edo State?

Table 4: Responses on the level of knowledge on bacterial vaginosis (BV) among female undergraduate nursing students

S/N	Items	N	YES	NO	Mean	SD
1.	Have you ever heard of Bacterial Vaginosis (BV) before?	282	259 (91.8%)	23 (8.2%)	0.92	0.27
2.	Do you know that Bacterial Vaginosis is caused by an imbalance of normal vaginal bacteria?	282	208 (73.8%)	74 (26.2%)	0.74	0.44

3.	Are you aware that BV can increase the risk of contracting sexually transmitted infections (STIs)?	282	243 (86.2%)	39 (13.8%)	0.86	0.35
4.	Do you know that BV may sometimes present without noticeable symptoms?	282	92 (32.6%)	170 (67.4%)	0.33	0.47
5.	Have you been taught about Bacterial Vaginosis during your nursing training at the University of Benin?	282	202 (71.6%)	80 (28.4%)	0.72	0.45
Total		**282**	**71.2**	**28.8**	**0.71**	**0.45**

The results from Table 4 show that female undergraduate nursing students at the University of Benin have a generally high level of awareness and knowledge about bacterial vaginosis (BV). A significant majority (91.8%) have heard of BV, and 86.2% understand that it increases the risk of sexually transmitted infections (STIs). Additionally, 73.8% know that BV is caused by an imbalance of normal vaginal bacteria, and 71.6% have received formal education on the topic during their nursing training. These findings indicate a solid foundation of knowledge regarding BV among the students.

However, there is a notable gap in their understanding of BV's asymptomatic nature, with only 32.6% aware that BV can present without noticeable symptoms. This suggests that while students are knowledgeable about some aspects of BV, there is a need for more comprehensive education on its less apparent forms. The overall mean of 0.71 and standard deviation of 0.45 indicate that, while most students possess adequate knowledge, variability exists, and further emphasis on these critical areas could improve their understanding of the condition.

Research Question 2: What are the common beliefs and misconceptions held by female undergraduate nursing students on the causes of BV?

Table 5: Responses on the common beliefs and misconceptions held by female undergraduate nursing students on the causes of BV.

S/N	Items	N	YES	NO	Mean	SD
1.	Do you believe that poor personal hygiene is the main cause of Bacterial Vaginosis?	282	281 (99.6%)	1 (0.4%)	0.99	0.04
2.	Do you think Bacterial Vaginosis is only contracted through sexual intercourse?	282	139 (49.3%)	142 (50.4%)	0.49	0.50
3.	Do you believe that using scented soaps or douches can lead to BV?	282	21 (7.4%)	261 (92.6%)	0.07	0.26
4.	Do you think BV is the same as a sexually transmitted infection (STI)?	282	182 (64.6%)	100 (35.4%)	0.65	0.48
5.	Do you believe that wearing tight underwear causes Bacterial Vaginosis?	282	51 (18.1%)	231 (81.9%)	0.18	0.38
Total		**282**	**47.8**	**52.2**	**0.48**	**0.50**

The responses in Table 5 provide valuable insights into the common beliefs and misconceptions about the causes of Bacterial Vaginosis (BV) among female undergraduate nursing students at the University of Benin. A significant majority (99.6%) believe that poor personal hygiene is the main cause of BV, indicating a strong misconception that hygiene is the primary factor in the condition's development. In contrast, 49.3% of students mistakenly think that BV is exclusively contracted through sexual intercourse, while the remaining 50.4% understand otherwise. Another misconception is evident in the belief that using scented soaps or douches can lead to BV, with only 7.4% of students agreeing with this, suggesting that most students do not associate these products with the condition. Additionally, 64.6% of students incorrectly believe that BV is the same as a sexually transmitted infection (STI), while 35.4% correctly distinguish it from STIs. Lastly, 18.1% of students think that wearing tight underwear causes BV, a belief held by a

minority of respondents. Overall, the findings highlight a blend of accurate and inaccurate beliefs about BV, with a significant portion of students holding misconceptions that could influence their understanding and management of the condition.

Research Question 3: What are the major risk factors associated with BV among female undergraduate nursing students at the University of Benin?

Table 6: Responses on the major risk factors associated with BV among female undergraduate nursing students.

S/N	Items	N	YES	NO	Mean	SD
1.	Do you frequently use vaginal douches or feminine hygiene sprays?	282	33 (11.7%)	249 (88.3%)	0.12	0.32
2.	Have you had multiple sexual partners in the past 12 months?	282	71 (25.2%)	211 (74.8%)	0.25	0.43
3.	Do you wear tight or synthetic underwear for long periods?	282	159 (56.4%)	23 (43.6%)	0.56	0.50
4.	Have you taken antibiotics in the past six months?	282	247 (87.6%)	35 (12.4%)	0.88	0.33
5.	Do you often experience an imbalance in vaginal pH due to personal hygiene practices or product use?	282	128 (45.4%)	156 (54.6%)	0.45	0.50
Total		**282**	**45.2**	**54.8**	**0.45**	**0.50**

The data in Table 6 highlights the major risk factors associated with bacterial vaginosis (BV) among female undergraduate nursing students at the University of Benin. The majority of respondents (87.6%) reported taking antibiotics in the past six months, a factor known to disrupt vaginal flora and potentially trigger BV, with a mean score of 0.88 and a standard deviation (SD) of 0.33. Over half of the participants (56.4%) admitted to wearing tight or synthetic underwear

for extended periods, suggesting a strong link between non-breathable clothing and BV risk (mean = 0.56, SD = 0.50). Additionally, 45.4% of students indicated experiencing vaginal pH imbalance due to hygiene practices or product use, while 25.2% had multiple sexual partners in the past year. Notably, only 11.7% frequently used vaginal douches or feminine sprays, indicating a lower but still relevant prevalence of this potentially harmful practice. The overall mean (0.45) and SD (0.50) suggest moderate exposure to these risk factors among the population.

The findings indicate that key risk factors for BV among female nursing students include recent antibiotic use, prolonged wearing of tight or synthetic underwear, vaginal pH imbalance from hygiene practices, and sexual behavior involving multiple partners. These results underline the need for targeted health education to address these specific behaviors and reduce the incidence of BV.

Research Question 4: What strategies can be implemented to improve knowledge and reduce risk factors associated with BV among female undergraduate nursing students at the University of Benin?

Table 6: Responses on the strategies that can be implemented to improve knowledge and reduce risk factors associated with BV among female undergraduate nursing students.

S/N	Items	N	YES	NO	Mean	SD
1.	Would you attend a seminar or workshop on Bacterial Vaginosis if organized by the university?	282	279 (98.9%)	3 (1.1%)	0.99	0.10
2.	Do you think including BV education in the nursing curriculum would improve student knowledge?	282	262 (92.9%)	20 (7.1%)	0.93	0.26
3.	Would you read educational materials (e.g., leaflets or online resources) about BV if they were made available?	282	259 (91.8%)	23 (8.2%)	0.92	0.27
4.	Do you believe peer education programs could help raise awareness about BV and its risk factors?	282	199 (70.6%)	83 (29.4%)	0.71	0.45
5.	Would you support routine health talks in hostels or student clinics to address BV and other reproductive health issues?	282	271 (96.1%)	11 (3.9%)	0.96	0.20
Total		**282**	**90.1%**	**9.9%**	**0.90**	**0.26**

The responses in Table 6 reveal that female undergraduate nursing students at the University of Benin show a high level of interest and readiness to embrace strategies aimed at improving knowledge and minimizing risk factors associated with Bacterial Vaginosis (BV). An overwhelming majority of the students (98.9%) indicated they would attend a seminar or workshop on BV if organized by the university, suggesting a keen desire for more formal and structured learning opportunities outside the classroom. Additionally, 92.9% of the students believe that incorporating BV education into the nursing curriculum would improve their understanding, highlighting the importance of integrating reproductive health topics into

academic coursework. Similarly, 91.8% reported willingness to read educational materials such as leaflets or online resources if made available, demonstrating the value of accessible, student-friendly information dissemination tools. Peer education was supported by 70.6% of respondents, which, while lower than other strategies, still indicates a positive response towards peer-led awareness efforts. Furthermore, 96.1% supported the idea of routine health talks in student hostels or clinics, pointing to the effectiveness of continuous, community-based health promotion activities. The overall mean score of 0.90 and low standard deviation of 0.26 suggest a high and consistent agreement across all the proposed strategies.

It is evident that female nursing students are open to multiple strategies for improving BV knowledge and reducing risk. The high acceptance of seminars, curriculum inclusion, educational materials, peer education, and hostel-based health talks indicates that a combination of formal education, peer influence, and accessible informational resources would be most effective. Implementing these interventions within the university environment could significantly enhance students' awareness and encourage healthy behaviors that prevent BV, thereby contributing to better reproductive health outcomes.

Research Question 5: How do personal hygiene practices and sexual behaviors influence the occurrence of BV among female undergraduate nursing students?

Table 7: Responses on how personal hygiene practices and sexual behaviors influence the occurrence of BV among female undergraduate nursing students.

S/N	Items	N	YES	NO	Mean	SD
1.	Do you often use perfumed soaps or feminine washes for vaginal cleansing?	282	69 (24.5%)	213 (75.5%)	0.24	0.43
2.	Do you clean your genital area from back to front after using the toilet?	282	183 (64.9%)	99 (35.1%)	0.65	0.48
3.	Have you ever had unprotected sexual intercourse with multiple partners?	282	4 (1.4%)	278 (98.6%)	0.01	0.10
4.	Do you regularly wear underwear for more than one day without changing?	282	2 (0.7%)	280 (99.3%)	0.01	0.10
5.	Do you engage in vaginal douching as part of your hygiene routine?	282	119 (42.2%)	161 (57.1%)	0.42	0.49
Total		**282**	**6.7%**	**73.1%**	**0.27**	**0.32**

The table presents data on personal hygiene practices and sexual behaviors that may influence the occurrence of Bacterial Vaginosis (BV) among female undergraduate nursing students. A majority of respondents (64.9%) admitted to cleaning the genital area from back to front—a practice that may increase the risk of introducing harmful bacteria to the vagina. Additionally, 42.2% reported engaging in vaginal douching, which is known to disrupt the natural vaginal flora, thereby increasing susceptibility to BV. About 24.5% of participants use perfumed soaps or feminine washes, which can also alter vaginal pH. However, risky sexual behaviors such as having unprotected sex with multiple partners (1.4%) and wearing underwear for more than one day without changing

(0.7%) were rarely reported, indicating generally good sexual hygiene among the respondents. The overall mean of 0.27 and standard deviation of 0.32 suggest low but variable engagement in practices that could predispose to BV.

The findings indicate that personal hygiene practices specifically improper genital cleaning direction and vaginal douching are more influential in the occurrence of BV among the respondents than risky sexual behaviors. While most students demonstrated good sexual hygiene, a significant proportion engaged in practices that could compromise vaginal health, highlighting the need for targeted education on safe and healthy hygiene routines.

Hypothesis 1: There is no significant relationship between personal hygiene practices and sexual behaviors influence on the occurrence of BV among female undergraduate nursing students at the university of Benin, Benin city, Edo state.

Table 8: Pearson correlation on significant relationship between personal hygiene practices and sexual behaviors influence on the occurrence of BV among female undergraduate nursing students

Variables	N	Pearson r	Sig(2tail)	Decision
Personal hygiene practices & sexual behaviors	**282**	**.829**	**.743**	**Rejected**
Occurrence of BV among female undergraduate nursing students				

Hypothesis in Table 8 sought to determine if there is a no significant relationship between personal hygiene practices and sexual behaviors influence on the occurrence of BV among

female undergraduate nursing students at the university of Benin. The result in table 8 revealed a Pearson correlation of .829 with a corresponding p-value of .743 at .05 alpha level. Since the p-value of .743 is less than the r-calculated value of .829, the null hypothesis is rejected while the alternate hypothesis is accepted. This implies that there is a significant relationship between personal hygiene practices and sexual behaviors influence on the occurrence of BV among female undergraduate nursing students at the university of Benin, Benin city, Edo state.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter contained the summary of the study, the conclusions drawn and recommendations offered.

5.1 Discussion of Findings

level of knowledge on bacterial vaginosis (BV) among female undergraduate nursing students

Findings from the study therefore indicate that there is a high knowledge of bacterial vaginosis (BV) among female undergraduate nursing students, however, there is a notable gap in their understanding of BV's asymptomatic nature, with only 32.6% aware that BV can present without noticeable symptoms. This suggests that while students are knowledgeable about some aspects of BV, there is a need for more comprehensive education on its less apparent forms. The overall mean of 0.71 and standard deviation of 0.45 indicate that, while most students possess adequate knowledge, variability exists, and further emphasis on these critical areas could improve their understanding of the condition.

The common beliefs and misconceptions held by female undergraduate nursing students on the causes of BV

Findings from the study shows that a significant majority (99.6%) believe that poor personal hygiene is the main cause of BV, indicating a strong misconception that hygiene is the primary factor in the condition's development. In contrast, 49.3% of students mistakenly think that BV is exclusively contracted through sexual intercourse, while the remaining 50.4% understand otherwise. Another misconception is evident in the belief that using scented soaps or douches

can lead to BV, with only 7.4% of students agreeing with this, suggesting that most students do not associate these products with the condition. Overall, the findings highlight a blend of accurate and inaccurate beliefs about BV, with a significant portion of students holding misconceptions that could influence their understanding and management of the condition.

The major risk factors associated with BV among female undergraduate nursing students

The findings indicate that key risk factors for BV among female nursing students include recent antibiotic use, prolonged wearing of tight or synthetic underwear, vaginal pH imbalance from hygiene practices, and sexual behavior involving multiple partners. These results underline the need for targeted health education to address these specific behaviors and reduce the incidence of BV. The majority of respondents (87.6%) reported taking antibiotics in the past six months, a factor known to disrupt vaginal flora and potentially trigger BV, with a mean score of 0.88 and a standard deviation (SD) of 0.33. Over half of the participants (56.4%) admitted to wearing tight or synthetic underwear for extended periods, suggesting a strong link between non-breathable clothing and BV risk (mean = 0.56, SD = 0.50). Additionally, 45.4% of students indicated experiencing vaginal pH imbalance due to hygiene practices or product use, while 25.2% had multiple sexual partners in the past year. Notably, only 11.7% frequently used vaginal douches or feminine sprays, indicating a lower but still relevant prevalence of this potentially harmful practice.

Strategies can be implemented to improve knowledge and reduce risk factors associated with BV among female undergraduate nursing students

Findings from the study reveal that female undergraduate nursing students at the University of Benin show a high level of interest and readiness to embrace strategies aimed at improving

knowledge and minimizing risk factors associated with Bacterial Vaginosis (BV). It is evident that female nursing students are open to multiple strategies for improving BV knowledge and reducing risk. The high acceptance of seminars, curriculum inclusion, educational materials, peer education, and hostel-based health talks indicates that a combination of formal education, peer influence, and accessible informational resources would be most effective. Implementing these interventions within the university environment could significantly enhance students' awareness and encourage healthy behaviors that prevent BV, thereby contributing to better reproductive health outcomes.

How personal hygiene practices and sexual behaviors influence the occurrence of BV among female undergraduate nursing students

The findings indicate that personal hygiene practices specifically improper genital cleaning direction and vaginal douching are more influential in the occurrence of BV among the respondents than risky sexual behaviors. While most students demonstrated good sexual hygiene, a significant proportion engaged in practices that could compromise vaginal health, highlighting the need for targeted education on safe and healthy hygiene routines. A majority of respondents (64.9%) admitted to cleaning the genital area from back to front—a practice that may increase the risk of introducing harmful bacteria to the vagina. Additionally, 42.2% reported engaging in vaginal douching, which is known to disrupt the natural vaginal flora, thereby increasing susceptibility to BV. About 24.5% of participants use perfumed soaps or feminine washes, which can also alter vaginal pH. However, risky sexual behaviors such as having unprotected sex with multiple partners

(1.4%) and wearing underwear for more than one day without changing (0.7%) were rarely reported, indicating generally good sexual hygiene among the respondents.

5.2 Summary

The study investigated the knowledge, belief and risk factors for bacterial vaginosis among female undergraduate nursing students at the university of Benin, Benin city, Edo state. To achieve the purpose of the study, five research questions were raised and answered. The population for this study was made up of all 200 level to 500 level nursing students of the university of Benin which was a total of 710. The sample size for the study was made up of 282 nursing students of university of Benin.

The instrument that was used for the data collection is a structured questionnaire. The questionnaire. The constructed questionnaire for the study was presented to the project supervisor and nursing ethical committee to confirm for content validity. Their opinion and suggestions were inputted into the work before it was administered to the respondents. The questionnaire was the instrument for data collection. descriptive cross-sectional survey design was adopted for the study. The researcher made use of frequency count, percentage and mean and standard deviation to compute the findings from the study.

Findings from the study include:

1. That there is a high knowledge of bacterial vaginosis (BV) among female undergraduate nursing students, however, there is a notable gap in their understanding of BV's asymptomatic nature.

2. That there is a blend of accurate and inaccurate beliefs about BV, with a significant portion of students holding misconceptions that could influence their understanding and management of the condition.
3. That the key risk factors for BV among female nursing students include recent antibiotic use, prolonged wearing of tight or synthetic underwear, vaginal pH imbalance from hygiene practices, and sexual behavior involving multiple partners.
4. Findings from the study reveal that female undergraduate nursing students at the University of Benin show a high level of interest and readiness to embrace strategies aimed at improving knowledge and minimizing risk factors associated with Bacterial Vaginosis (BV).
5. That there is low risky sexual behaviors such as having unprotected sex with multiple partners and wearing underwear for more than one day without changing indicating generally good sexual hygiene among the respondents.

Implication to Nursing

The study investigated the knowledge, belief and risk factors for bacterial vaginosis among female undergraduate nursing students at the university of Benin, Benin city, Edo state. The findings of this research on the knowledge, beliefs, and risk factors for Bacterial Vaginosis (BV) among female undergraduate nursing students at the University of Benin will have significant implications for the nursing profession. It highlighted the need for improved education and awareness on BV, as a considerable number of students demonstrated limited knowledge and held misconceptions about its causes and risk factors. This will affect the quality of reproductive health education they provide as future nurses, emphasizing the importance of integrating comprehensive BV content into nursing curricula. The results will encourage the development of

targeted interventions, such as health talks and peer education programs, which will equip nurses to better educate patients and promote preventive health practices. Ultimately, addressing these gaps will enhance nurses' ability to support women's reproductive health more effectively.

5.3 Limitation of the study

This study was conducted in one tertiary institution and also the data collected were limited to Nursing students in the of the University of Benin thereby limiting the generalizability of the findings. Some respondents were unwilling to fill the questionnaire. However, this was minimized by creating rapport with the respondents and assuring them that the purpose of the research was only for academic purpose and all response would be kept confidential.

5.4 Conclusion

This research has provided valuable insights into the level of knowledge, beliefs, and risk factors associated with Bacterial Vaginosis (BV) among female undergraduate nursing students at the University of Benin. The findings revealed that while some students possess basic knowledge about BV, a significant number hold misconceptions and engage in risk-prone hygiene and sexual behaviors that could increase their vulnerability to the condition. The study also identified the urgent need for structured educational interventions and highlighted the willingness of students to learn more through seminars, curriculum integration, and peer education. Addressing these gaps will not only empower nursing students to protect their own reproductive health but will also enhance their competence in delivering quality health education and care to the broader female population.

5.5 Recommendations

1. There should be incorporation of BV education into the nursing curriculum to ensure all students receive accurate and comprehensive knowledge on its causes, prevention, and management.
2. The department should organize regular seminars and workshops on reproductive health issues, including BV, to reinforce classroom learning and promote practical awareness.
3. The department should implement peer education programs to encourage open discussions among students and create a supportive learning environment for sensitive health topics.
4. The department should provide accessible educational materials such as leaflets, posters, and digital content on BV in hostels, libraries, and student clinics.
5. The department should conduct periodic health campaigns within the university to promote healthy hygiene practices and reduce BV risk factors among female students.

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APPENDIX

DEPARTMENT OF NURSING SCIENCE

FACULTY OF BASIC MEDICAL SCIENCES

UNIVERSITY OF BENIN, BENIN CITY.

Dear respondents,

I am an undergraduate student in the above named Department. As part of the requirement for the programme, I am conducting a research **on Knowledge, Belief and Risk Factors for Bacterial Vaginosis Among Female Undergraduate Nursing Students At The University Of Benin, Benin City, Edo State**. In this regard, you have been randomly selected as a sample. I also wish to assure you that your answers will be treated in strict confidence and used for the stated academic purpose only.

Thank you for your cooperation.

Section A: Demographic Information

(Instruction: Please tick the most appropriate option or fill in the blank where applicable.)

Age: ☐ 17–19 years, ☐ 20–22 years, ☐ 23–25 years, ☐ 26–28 years, ☐ 29–31 years, ☐ 32–35 years

Level of Study: ☐ 200 Level, ☐ 300 Level, ☐ 400 Level, ☐ 500 Level

Marital Status: ☐ Single, ☐ Married, ☐ Divorced, ☐ Widowed

SECTION B: QUESTIONNAIRE

RESEARCH OBJECTIVE 1: To find out the level of knowledge on bacterial vaginosis (BV) among female undergraduate nursing students at the University of Benin, Benin City, Edo State.

1. Have you ever heard of Bacterial Vaginosis (BV) before? Yes ( ) No ( )
2. Do you know that Bacterial Vaginosis is caused by an imbalance of normal vaginal bacteria? Yes ( ) No ( )
3. Are you aware that BV can increase the risk of contracting sexually transmitted infections (STIs)? Yes ( ) No ( )
4. Do you know that BV may sometimes present without noticeable symptoms? Yes ( ) No ( )
5. Have you been taught about Bacterial Vaginosis during your nursing training at the University of Benin? Yes ( ) No ( )

RESEARCH OBJECTIVE 2: To ascertain the common beliefs and misconceptions held by female undergraduate nursing students on the causes of BV.

6. Do you believe that poor personal hygiene is the main cause of Bacterial Vaginosis? Yes ( ) No ( )
7. Do you think Bacterial Vaginosis is only contracted through sexual intercourse? Yes ( ) No ( )
8. Do you believe that using scented soaps or douches can lead to BV? Yes ( ) No ( )
9. Do you think BV is the same as a sexually transmitted infection (STI)? Yes ( ) No ( )

10. Do you believe that wearing tight underwear causes Bacterial Vaginosis? Yes ( ) No ( )

RESEARCH OBJECTIVE 3: To investigate the major risk factors associated with BV among female undergraduate nursing students at the University of Benin.

11. Do you frequently use vaginal douches or feminine hygiene sprays? Yes ( ) No ( )
12. Have you had multiple sexual partners in the past 12 months? Yes ( ) No ( )
13. Do you wear tight or synthetic underwear for long periods? Yes ( ) No ( )
14. Have you taken antibiotics in the past six months? Yes ( ) No ( )
15. Do you often experience an imbalance in vaginal pH due to personal hygiene practices or product use? Yes ( ) No ( )

RESEARCH OBJECTIVE 4: To find out the strategies that can be implemented to improve knowledge and reduce risk factors associated with BV among female undergraduate nursing students at the University of Benin.

16. Would you attend a seminar or workshop on Bacterial Vaginosis if organized by the university? Yes ( ) No ( )
17. Do you think including BV education in the nursing curriculum would improve student knowledge? Yes ( ) No ( )
18. Would you read educational materials (e.g., leaflets or online resources) about BV if they were made available? Yes ( ) No ( )

19. Do you believe peer education programs could help raise awareness about BV and its risk factors? Yes ( ) No ( )
20. Would you support routine health talks in hostels or student clinics to address BV and other reproductive health issues? Yes ( ) No ( )

RESEARCH OBJECTIVE 5: To determine how personal hygiene practices and sexual behaviors influence the occurrence of BV among female undergraduate nursing students.

21. Do you often use perfumed soaps or feminine washes for vaginal cleansing? Yes ( ) No ( )
22. Do you clean your genital area from back to front after using the toilet? Yes ( ) No ( )
23. Have you ever had unprotected sexual intercourse with multiple partners? Yes ( ) No ( )
24. Do you regularly wear underwear for more than one day without changing? Yes ( ) No ( )
25. Do you engage in vaginal douching as part of your hygiene routine? Yes ( ) No ( )