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Abstract HIV Testing and Multiple Sexual Partnerships Among Men in Nigeria

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This is to certify that the doctoral study by

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MPH, Manchester Metropolitan University, 2013

BDS, University of Benin, 2000

Doctoral Study Submitted in Partial Fulfillment

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Doctor of Public Health

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Abstract

Low Human Immunodeficiency Virus [HIV] test uptake and multiple partnerships among men in Nigeria are contributing factors to HIV transmission. The purpose of this quantitative cross-sectional study was to examine the relationship between HIV test uptake, sociodemographic characteristics, HIV knowledge, attitude, and multiple sexual partnerships. The health belief model provided the framework for the study. Data were collected from the 2013 Nigerian National Demographic Health Survey, which surveyed 17,359 Nigerian men ages 15-49 years. Chi-square and binary logistic regression analysis showed that sociodemographic variables (age, residence, marital status, religion, wealth status, ethnicity, and educational level), HIV test uptake, HIV knowledge, and attitudes toward negotiating safer sex are significantly associated with multiple sexual partnerships. Findings showed that multiple sexual partnerships were higher among middle-aged men (25-39 years) in Nigeria and lower among Hausa Muslims. Findings showed that HIV testing is a significant predictor of multiple sexual partnerships, those that have been tested are more likely to be engaged in multiple sexual partnerships than those never tested. A well-tailored intervention that will promote follow up with men after HIV test uptake is essential to reduce the practice of multiple sexual partners among them. This may result in positive social change by presenting public health experts, donor agencies, and health teachers with valuable information about how multiple sexual partners and HIV testing can influence sexual risk behaviors among men. This may advance HIV prevention and control practices among men in Nigeria.

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Dedication

My sincerest gratitude goes to the Almighty God for making it possible for me to go this far in my academic pursuit. This doctoral study is dedicated to my lovely wife, Mrs. Meyeyin Dasola, and my children, Samuel, Daniel, and Esther.

Acknowledgments

My profound appreciation goes to my chair, Dr. Albert Terrillion, and committee member, Dr. Amany Refaat. You were always so liberal with your time and knowledge. It was a great privilege learning from you. Let me equally use this opportunity to appreciate other people who contributed to the success of my doctoral study. My heartfelt appreciation goes to Mr. Olasehinde Gbenga, Mr. Attah Adejor, Mr. Kolawole Charles, Prof. Dick Heller, and my wife and children for their support and prayers.

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Section 1: Foundation of the Study and Literature Review

Nigeria has a high burden of HIV with an estimated 3 million people living with HIV (National Agency for the Control of AIDS [NACA], 2015). Nigeria is second only to South Africa for countries with the highest burden of HIV globally (Ibrahim, Ipadeola,Adebayo, &Fatusi, 2013; NACA, 2015). In sub-Saharan Africa, AIDS-related mortality is high among essential service providers such as health care workers, teachers, police, military, and people who drive the economy of the region, which is a threat to the security and economic development of the region (De Cock, Bunnell, &Mermin, 2017). Men 15-49 years old who form a large proportion of the population are sexually active and contribute over 75% of new infections (Ibrahim et al., 2013). In addition, the incidence and prevalence of HIV among men pose serious challenges to public health because of the increase in the number of new infections (Ibrahim et al., 2013; NACA, 2015). Studies have shown that the high incidence of HIV among men in Nigeria can be attributed to factors such as multiple sex partners, youthful exuberance, and low condom use (Awofala&Ogundele, 2018; Ibrahim et al., 2013; World Health Organization [WHO], 2006). Nigeria's main strategy in response to the HIV epidemic is HIV counseling and testing (Ibrahim et al, 2013). For this step in prevention to be effective, HIV counseling and testing (HCT) should be accessible and suitable for men at risk. HCT is used to prevent HIV transmission by identifying individuals' HIV status and giving counsel on how they can develop appropriate measures to minimize or prevent HIV risk behaviors (NACA, 2015).

HCT services enable individuals who tested positive to have access to life-saving treatment with antiretroviral therapy and medical care that allow them to stay healthy and reduce their risk of transmitting HIV to others (Ibrahim et al., 2013). Also, when individuals test negative, they benefit from prevention support systems that will enhance healthy living (Branson, 2010). Though HCT has a lot of benefits, studies have shown low uptake of HCT among men resulting in high incidence among this population (Federal Ministry of Health [FMoH], 2006; Ibrahim et al., 2013; McCauley, 2004; Balogun, Jimoh, & Yahaya, 2010). With about 14,000 people infected with HIV daily in Nigeria and men contributing more than half of the number, low uptake of HCT services among men indicates that higher numbers of infected persons are unidentified, and this can limit the opportunity for prevention, treatment, care, and support services for them (Ibrahim et al., 2013).

The objective of this study was to examine the sociodemographic characteristics associated with multiple sexual partnerships, low HIV test uptake among men in Nigeria, and the relationship between HIV test uptake and multiple sexual partnerships among men in Nigeria. Also, I examined the relationship between knowledge of HIV and attitudes toward safe sex and multiple sexual partnerships. Findings may be of assistance to stakeholders in the health sector to halt the increase of new HIV infections in Nigeria. This study may result in positive social change by presenting public health experts, donor agencies, and health teachers with valuable information on how multiple sexual partners, HIV knowledge, and attitudes toward sex influence sexual risk behaviors among men in Nigeria, which may lead to efficient HIV education policy formulation to advance HIV

prevention and control practices. A well-articulated and implemented HIV policy may reduce the number of orphans, HIV-related deaths, and cost of HIV treatment in Nigeria, and may improve quality of life. The findings may add to the body of knowledge by providing information that may be needed to determine where progress can be made by government officials in partnership with stakeholders in the health sector to bolster the deficient health infrastructure that has hindered HIV prevention and control in Nigeria.

The findings of the study may enhance the planning of a behavioral change program that may have a positive social impact on HIV testing behavior and attitudes toward sexual behavior among men in Nigeria and to reinforce HIV prevention and control programs that target men from different socioeconomic backgrounds. The findings of the study may influence community-based interface with a focus on HIV testing and treatment and may offer supportive information that may be useful in referral programs that can help reduce the HIV epidemic. Also, the findings may provide information about men's sexual health behavior in Nigeria that may be of importance to health planners and public health experts in identifying men's health needs and may mitigate the social and cultural impediments that have resulted in low HIV test uptake among men in Nigeria. Also, findings may provide information about the association between sociodemographic elements and the incidence of new HIV infection in Nigeria. The findings may be useful to researchers and health planners in planning health interventions or programs aimed at HIV reduction through behavioral change in Nigeria, which may result in positive social change among Nigerians because behavioral change is a key component in addressing HIV and its socioeconomic effects.

Problem Statement

The HIV epidemic has posed a serious threat to population health in Nigeria; it has had a negative impact on the health system and has overturned major developmental gains such as the decrease in under-five mortality rates and maternal mortality in Nigeria (NACA, 2014).HIV was first reported in 1985 in Nigeria, and the following year it was reported at the International AIDS Conference (NACA, 2012). Nigeria, with a population of over 168 million, has the second highest population of people living with HIV after South Africa (Avert, 2016b; NACA, 2012; Joint United Nations Program on HIV/AIDS [UNAIDS], 2014; WHO, 2014). Globally, HIV is one of the major public health issues of serious concern, and it remains a threat to human life (UNAIDS, 2011, 2015). Nigeria has the third highest global HIV burden with 9% of the world's HIV positive population (Avert, 2016a; NACA, 2015). With most infected individuals unaware of being HIV positive (Chemaitelly, Cremin, Shelton, Hallett, & Abu-Raddad, 2011; Mucheke, 2016), it is imperative that increased awareness and testing methods are implemented in Nigeria and other parts of sub-Saharan Africa.

HIV testing remains a major and efficient strategy to discover infection. According to the 2013 Nigeria Demographic and Health Survey (NDHS) and Population.gov.ng. (2017), approximately 77% of the total 17,359 men sampled had never been tested for HIV at the time of the survey. Multiple sexual partnerships have been shown to be one of the means by which HIV infection spreads in Nigeria (Dimbuene, Emina, & Sanko, 2014; NACA, 2015; UNAIDS, 2009). Nigerians are sexually active with the median age at sex debut of 19.4 years: 17.6 years for women and

21.1 years for men (Population.gov.ng., 2017; UNAIDS, 2014; WHO, 2014). With 80% of new infections caused by exposed heterosexual sex and low HIV testing uptake of 23% in males and 29% in females (Avert, 2016a; UNAIDS, 2014), it is essential to study the factors responsible for low HIV test uptake in the country. Factors such as stigmatization, inadequate HCT centers, logistics, and complexity in supplying testing kits have been identified as causes of low HIV test uptake in Nigeria (Avert, 2016a; Bloch et al., 2014; NACA, 2014; Pottie et al., 2014). I observed a gap in the literature because the association between HIV test uptake and multiple sexual partnerships had not been well documented. Literature revealed evidence of factors influencing multiple sexual partnerships, use of HBM constructs in determining behaviors associated with HIV testing, and factors associated with low HIV test uptake, but there was a gap on the relationship between HIV testing and multiple sexual partnership in Nigeria. In addition, there was no documented evidence of the behavioral factors motivating men having multiple sexual partners to go for an HIV test.

Researchers examined factors associated with women's testing with little recognition of men's testing behaviors (Stephenson, Elfstrom, & Winter, 2013). Some researchers described the determinants of testing among men in developed nations with a focus on men who have sex with men (Stephenson et al., 2013). Studies on determinants of testing have focused on testing among couples and women seeking antenatal care (Cartoux,Meda, Van de Perre, Newell, De Vincenzi, &Dabis, 2008), but only a few studies focused on men. Dimbuene et al. (2014); Olaniran, Persson, and Oyekanmi (2013); and Udigwe, Adogu, Nwabueze, Ubajaka, &Onwasigwe, 2014) concluded that

poverty, urbanization, modernization, cultural changes, and migration are factors influencing multiple sexual partnerships in Nigeria. In addition,multiple sexual partnerships, low levels of awareness of individual risk, inadequate treatment for sexually transmitted infections, poor access to quality health care services, gender inequality, poverty, stigma, and discrimination are factors promoting the spread of HIV in Nigeria (National Population Commission & ICF International, 2013). However, the lack of study on HIV test uptake and multiple sexual partnerships in Nigeria necessitated this research. The findings of this study may supply information on issues that prompt men to choose HIV testing, which may be of great significance in designing programs that will be useful in reducing the rate of new HIV infection in Nigeria. Also, findings may show if individuals with multiple sexual partners are likely to undergo HIV testing.

Purpose of the Study

The purpose of the study was to examine the low level of HIV test uptake among men with multiple sexual partnerships in Nigeria with the specific objectives to determine the level of Nigerian men's participation in HIV testing, to examine the suitability of the health belief model in understanding and foretelling HIV testing purpose, and to identify the sociodemographic characteristics that are significantly associated with multiple sexual partnerships. I also investigated the relationship between multiple sexual partnerships and knowledge of HIV and attitudes toward sex.

The choice of quantitative methodology was based on the fact that quantitative investigation is in line with inquiry that addresses human behavior and the different habits displayed by people in society (Creswell, 2009). Quantitative methodology was

appropriate for the study because it required objective measurements and the statistical analysis of data collected through surveys. Quantitative methodology requires statistical analysis, which is used to generalize findings (University of Surrey, 2015). Quantitative methodology is used to reduce complex problems to a limited number of variables, to examine the associations between variables, and to identify relationships between variables in controlled circumstances (University of Surrey, 2015). Also, quantitative methodologyis used to test theories or hypotheses in samples that are representative of the population (University of Surrey, 2015).

The findings from this study may be used to evaluate the success and failure of HIV testing in Nigeria. At the level of organizations, findings from the study may be useful to partners in HIV prevention in Nigeria to design programs that will promote HIV testing not only among men in the country, but also in the entire society. At the societal and policy level, the findings may enhance health information systems by providing information on socioeconomic determinants of health and health status, and to help policymakers make evidence-based decisions. Also, findings may be used to build infrastructure by expanding HCT centers, providing adequate logistics, and equipping hospitals with trained personnel, the findings may enhance the incorporation of health behavior theories in programs related to HIV prevention and provide evidence that is scientifically based in solving HIV problems.

Research Questions and Hypotheses

The research questions (RQs) and hypotheses for the study were as follow:

RQ1: To what extent are the sociodemographic characteristics such as age, residence, marital status, religion, ethnicity, wealth status, and educational level significantly associated with multiple sexual partnerships among men ages 15-49 in Nigeria?

H_o1: There is no significant association between sociodemographic characteristics and multiple sexual partnerships among men ages 15-49 in Nigeria.

H_a1: There is significant association between sociodemographic characteristics and multiple sexual partnerships among men ages 15-49 in Nigeria.

RQ2: Is there a statistically significant relationship between HIV test uptake and multiple sexual partnerships among men ages 15-49 in Nigeria?

H_o2: HIV test uptake is not significantly related to multiple sexual partnerships among men ages 15-49 in Nigeria.

H_a2: HIV test uptake is significantly related to multiple sexual partnerships among men ages 15-49 in Nigeria.

RQ3: Is there a relationship between HIV knowledge and attitudes toward negotiating safer sex and multiple sexual partnerships among men ages 15-49 in Nigeria?

H_o3: There is no relationship between HIV knowledge and attitudes toward negotiating safer sex and multiple sexual partnerships among men ages 15-49 in Nigeria

H_a3: There is a relationship between HIV knowledge and attitudes toward negotiating safer sex and multiple sexual partnerships among men ages 15-49 in Nigeria.

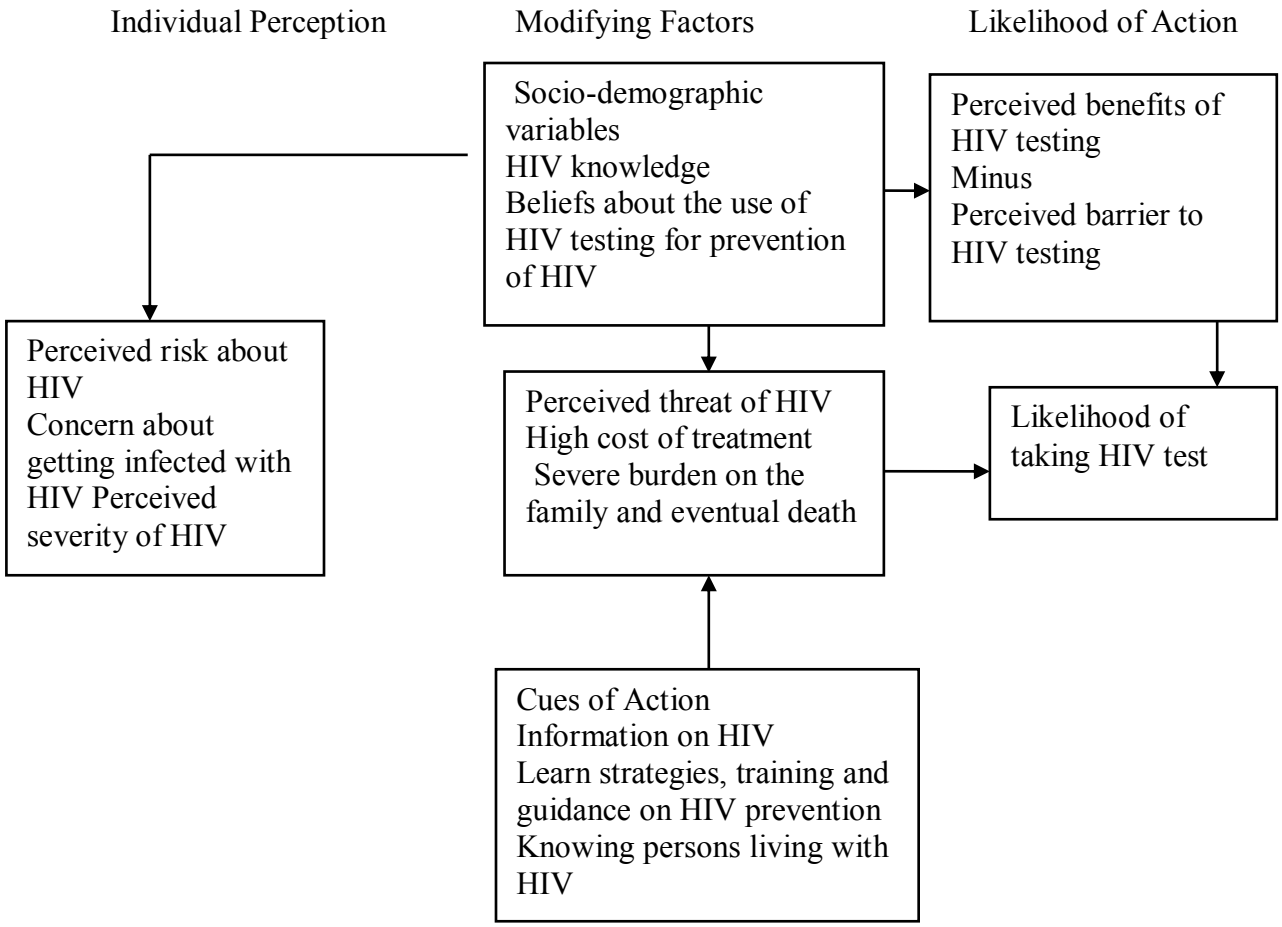
Theoretical Foundation for the Study

In the study of HIV and its prevention, theories and models such as social cognitive theory, the transtheoretical model, the health belief model, and the ecological model have been of great importance. However, in this study my choice of model was the health belief model (HBM). HBM began in the 1950s by the U.S. Public Health Service Department where it was used to explain the failure of public health preventive measures (Glanz, Lewis, &Rimer, 2002; Hochbaum, 1958). The constructs of HBM are perceived susceptibility, perceived severity, perceived benefits, and perceived barriers, and the later addition of cues to action, modifying factors, and self-efficacy (Glanz et al.,2002; Hochbaum, 1958). HBM constructs are the basis of people's readiness to do something and center on the belief that individuals will take helpful action toward their health if they are familiar with consequences of the harmful behavior (ReCAPP, 2016). HBM is a health behavior theory that came into existence in response to the collapse of a free tuberculosis health screening program (Glanz et al., 2002). The poor response of individuals to the tuberculosis health crisis in the 1950s is similar to the present HIV/AIDS epidemic. Perceived risk for HIV infection may drive HIV testing among men and explain disparities in HIV testing (Kabiru, Beguy, & Zulu, 2011).

An assumption of the HBM is that an individual's possibility of exhibiting a certain health behavior is controlled by his or her perceived susceptibility to the health outcome, such as the subjective perception of being infected with HIV; the perceived gravity of the health outcome, such as person's feelings about the socioeconomic cost of living with HIV/AIDS; the perceived benefits of preventive actions, such as getting tested

for HIV; the perceived barriers or consequences of getting involved in a particular health act, such as the stigma associated with being HIV positive; cues to action that drive individuals to act, such as promotion and advocacy that persuade people to do HIV testing; and self-efficacy that prompts individuals to take certain health decisions to lessen a particular health situation (Kabiru et al., 2011).The constructs of the HBM were used in this study to examine why people shun HIV testing. The hypotheses of the study were based on HBM and its constructs used to enhance knowledge of why the rate of HIV testing is low among men in Nigeria and its influence on sexual behavior. The constructs of HBM as it relates to HIV testing are illustrated in Figure 1.

Figure 1. Health belief model



Perceived susceptibility refers to the seriousness of contracting a disease and indicates whether a person feels vulnerable to a difficult health condition (Glanz, Rimer, & Viswanath, 2015; Janz, Champion, & Stretcher, 2002). In this study, perceived susceptibility referred to the person's perception of being infected with HIV. This construct plays a role in encouraging individuals' adherence to health professionals' counsel. If people perceive that they are vulnerable to HIV, they may want to go for HIV screening. In Tanzania, HBM has been used to forecast the intentions of 186 medical students to partake in voluntary counseling and testing for HIV (Vermeer, Bos, Mbwambo, Kaaya, &Schaalma, 2009). HBM construct has been used to looked at students' intentions to test for HIV and findings showed that HBM constructs explained 31% of the variance of intent to partake in HIV testing (Vermeer et al. 2009). Vermeer et al. also observed that perceived susceptibility to HIV, fear of infection, and self-efficacy were the major predictors of an individual's intent to partake in HIV testing and documented that HBM accounted for a small percentage of the explained discrepancy in the students' intention to partake in HIV testing and suggested that the fusion of social and cultural variables to the HBM might enhance its validity in sub-Saharan Africa. People who see themselves as susceptible to HIV are more likely to be conscious of their HIV status (De Wit & Adam, 2008) and are more prepared to agree to HIV testing (De Paoli, Manongi, &Klepp, 2004; Nöthling&Kagee, 2013).

Perceived Severity

Perceived severity refers to the seriousness of the disease a person is suffering from. Perceived severity also entails the impact of the disease on an individual's life

(Turner, Hunt, DiBrezzo& Jones, 2004). For example, the perceived gravity of the health outcome is as person's feelings about the socioeconomic cost of living with HIV/AIDS (Kabiru et al., 2011). In addition, the connection between perceiving HIV infection as severe and receiving HIV testing varies (Nöthling&Kagee, 2013). For instance, perceived severity has been positively linked with plan to partake in HIV testing (De Paoli et al., 2004), but Zak-Place and Stern (2004) argued that no relationship existed between them.

Perceived Benefits

Perceived benefits refer to an individual's perception of the benefits of adopting new behavior and how the behavior may decrease the possibility of being affected by the disease (Turner et al., 2004). In the current study, perceived benefits referred to the belief in the effectiveness of HIV testing to reduce exposure to HIV infection associated with the readiness to partake in HIV testing. Perceived benefits are an essential element in the acceptance of HIV testing by men. If not convinced of the gains of partaking in HIV screening, men may not make themselves available for testing. Also, a strong link between the knowledge of the benefits associated with HIV testing and readiness to consider HCT has been established (De Wit & Adam, 2008; Zak-Place & Stern, 2004).

Researchers have linked access to HIV care, biased individual risk assessment, awareness of means of HIV transmission, encouragement from sexual partners, suitable social support, and reduced HIV-related stigma to the possibility of accepting HIV testing (Bassett et al., 2008; De Wit& Adam, 2008; Gage & Ali, 2005; Mwamburi, DlaDla, Qwana, & Lurie, 2005; Nakanjako, Kyabayinze, Kamya, & Mayanja-Kizza, 2007; Nöthling&Kagee, 2013; Peltzer, Nzewi, & Mohan, 2009). Abebe and Mitikie (2009) used

the HBM to determine the perception and attitude of college students toward voluntary counseling and testing services in Ethiopia and concluded that students with high perceived benefits of HIV testing were likely to have intention to go for HIV testing.

Perceived Barriers

Perceived barriers refer to possible hindrances to taking action; individuals at this stage place priority on the difficulties to be encountered in an attempt to accept a new behavior (Glanz et al., 2015; Turner et al., 2004). In the current study, perceived barriers included the perceived consequences of HIV infections, such as the stigma associated with being HIV positive. Identifying key issues that draw individuals away from HIV testing is important in preventing new HIV infections (Glanz et al., 2015). However, different factors that discourage the possibility of accepting HIV testing have also been acknowledged (Nöthling&Kagee, 2013). These factors include the belief that HIV-positive individuals will die, low perceived risk of HIV infections, fear of stigmatization, fear of losing insurance benefits, fear of discrimination, fear of social separation, concerns about secrecy of testing, and not being psychologically ready for the test (Bassett et al., 2007; Gage & Ali, 2005; Lapidus, Bertolli, McGowan, & Sullivan, 2006; Nuwaha, Kabatesi, Muganwa, & Whalen, 2002; Peltzer et al., 2002; Simbayi, Kalichman, Strebel, Coete, Henda, &Mqeketo, 2007).

Perceived Self-Efficacy

Self-efficacy is the confidence that a person can perform an action effectively. Self-efficacy is the assurance that people will take advice on a particular health behavior (Janz et al., 2005; Turner et al., 2004). For this study, self-efficacy referred to an individual's belief that he or she would participate in HIV screening. Self-efficacy referred to men's perceived vulnerability and how their perception influenced their drive for HIV testing.

Cues to Action

Cues to action are the internal and external factors that could trigger a particular health behavior or force individuals to alter their behaviors (Glanz et al., 2015). Cues to action are the environmental factors that influence individuals' readiness for action (Glanz et al., 2015). The use of jingles, flyers, and billboards to display the consequences of HIV infections can change people's disposition to HIV test uptake. Also, family members, associates, and peer groups may influence men to participate in HIV screening (Simuzoshya, 2009). In the current study, routine HIV testing prescribed for individuals who have access to health care in Nigeria was examined as a cue to exploit HIV testing services among men in Nigeria. Routine screening means testing all patients in a particular location regardless of the risk of any individual patient (Petroll. Galletly, Havens, Kwiecinski, & Pinkerton, 2008). Routine HIV screening will provide more people with information about their status so they can benefit from early diagnosis and treatment, thereby reducing the menace of infecting others (Rucker, 2010). The fundamentals of the 2006 CDC revised proposal for HIV testing are that all patients ages

13−64 years should be screened for HIV in all medical settings without regard to risk, that separate written consent for HIV testing should not be required, and that HIV prevention counseling should not be a prerequisite for HIV testing (CDC, 2017b; Petroll et al., 2008). The CDC (2017b) recommendation for routine HIV testing was important in this study to provide opportunities for testing individuals who may not see themselves as vulnerable to HIV infection and those who may be opposed to participating in HIV testing.

One feature of the recommendation is that it does not stipulate a written or oral consent for HIV testing, but assent for HIV screening. However, testing is voluntary, and patients can turn down the services if they are not interested in participating in HIV testing. Routine HIV screening programs have been successful with blood donors and pregnant women, but this outcome has not been recorded among men. Routine screening of pregnant women has allowed health care professionals to take appropriate prophylactic measures to prevent HIV transmission to infants, such as administering perinatal antiretroviral therapy to women infected with HIV and prophylactic antiretrovirals to newborns. The CDC recommendation has the potential of advancing a yearly testing for HIV among individuals who are sexually active, such as men ages 15-49 years in Nigeria. Also, the recommendation if effectively executed has the capacity to remove barriers of access to HIV testing and treatment for people who lack access to primary health care.

Modifying Factors

Modifying factors are sociodemographic and structural variables that can influence an individual's perception (Kabiru et al., 2011).Education can play a role in

disseminating information on the availability of HIV testing services (Kabiru et al., 2011). Also, HIV knowledge can drive people for HIV screening. The purpose of the current study was to examine the degree to which the constructs of the HBM, such as perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action might forecast acceptability of HIV testing among men in Nigeria.

Nature of the Study

The study was quantitative in nature to examine HIV testing and multiple sexual partnerships among men in Nigeria using secondary data obtained through a cross-sectional survey. The independent variables for the first research question were age, residence, religion, marital status, economic level, and educational level. The dependent variable was the number of multiple sexual partnerships. In the second research question, the dependent variable was the number of multiple sexual partnerships, and the independent variable was HIV testing. In the third research question, the independent variables were HIV knowledge and attitude such as a woman refusing to have sexual intercourse with her husband if she knows he has sex with another woman (Population.gov.ng., 2017), and the dependent variable was the number of multiple sexual partnerships. I defined multiple sexual partners as having had sexual intercourse with more than one partner in the last 12 months prior to the survey (see Dimbuene et al., 2014; Indicator Registry, 2017; Population.gov.ng., 2017).

I conducted the study using secondary data obtained by sampling a population of sexually active Nigerian men ages 15 to 49 years irrespective of current marital status. The population was randomly sampled through multistage sampling by the 2013 Nigeria

Demographic and Health Survey (National Population Commission & ICF, 2014; Population.gov.ng., 2017). The sample was nationally representative and covered the entire Nigerian population residing in noninstitutional dwelling units in the country (Population.gov.ng., 2017). The data set included 17,359 men sampled across the country from the 2013 NDHS (see National Population Commission & ICF, 2014). With the application of HBM, the study may add to knowledge of why the rate of HIV testing is low among men in Nigeria and its influence on sexual behavior.

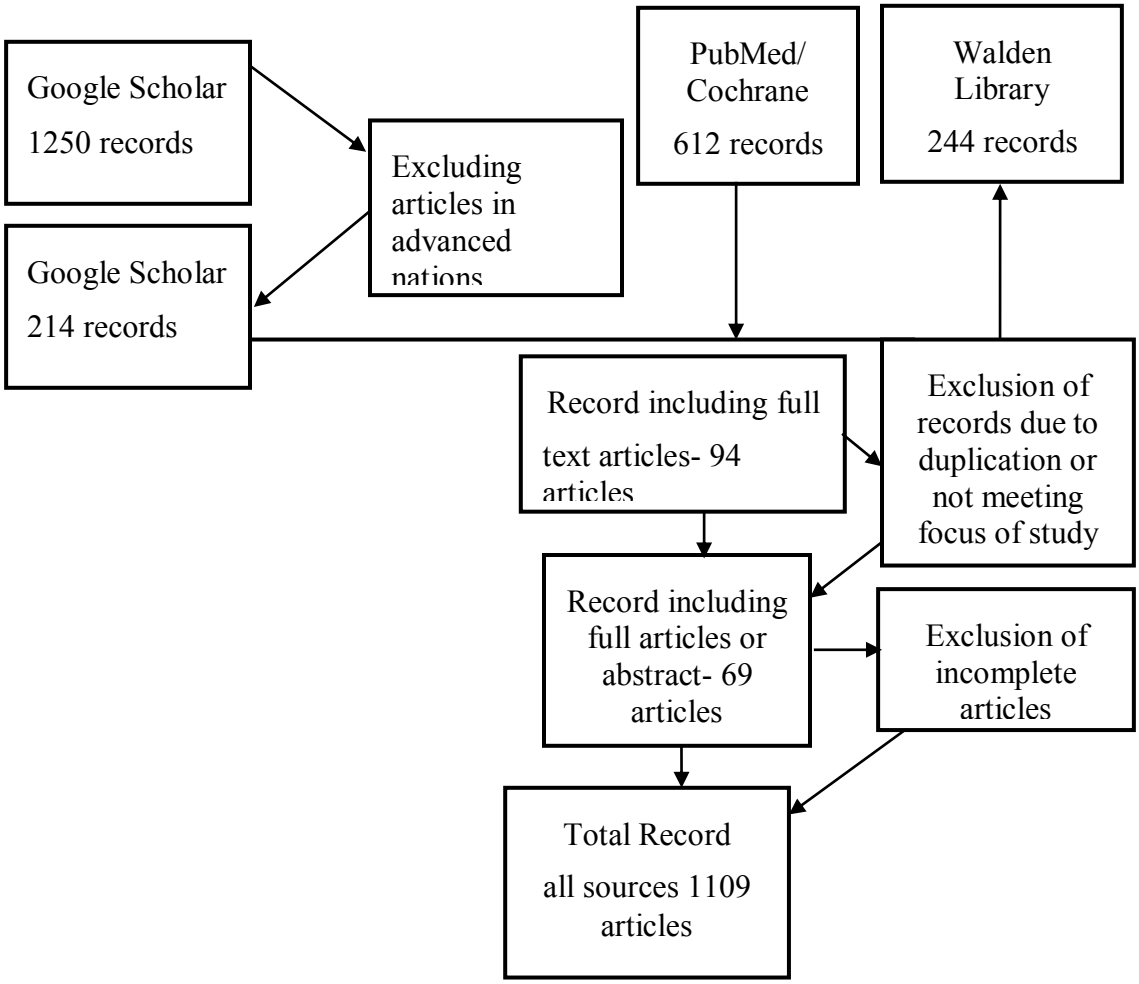
Literature Search Strategy

In the literature search, I employed a systemic search using different databases and search engines for papers published in English between 1981 and 2017. The databases I used to identify relevant peer-reviewed articles included the following:

- Search terms used for Cochrane Library, MEDLINE, PubMed, and EMBASE included *risk behaviors*,HIV/AIDS,HIV attitude, HIV behavior, knowledge, HIV epidemiology, andglobal HIV epidemic.
- The search terms for ProQuest, SAGE Full Text collections, EBSCO host, Lancet, Science Direct, Academic Search Premier, and BioMed Central included HIV in Nigeria, types of HIV testing in Nigeria, religious beliefs, HIV knowledge, HIV attitudes, multiple sexual partnerships, challenges of HIV test uptake,and importance HIV testing.
- Search terms used for Google scholar included multiple sexual partnerships and HIV, problems of HIV,and HIV prevention and intervention.

I also considered publications from global health organizations and abstracts from international AIDS conferences. HIV statistics and recent developments on HIV prevention and control were searched using the Centers for Disease Control and Prevention, Avert, World Health Organization, and Joint United Nations Program on HIV/AIDS websites, as shown in Figure 2.

Figure 2. Flow chart



Literature Review Related to Key Variables and Concepts

The focus of this study was on factors that impact the completion and effectiveness of HIV testing among men in Nigeria with multiple sexual partnerships. Mtenga, Exavery, Kakoko, andGeubbels (2015) concluded that HIV testing is an important intervention that can promote positive sexual behavior and enhance contact with early treatment, care, and support. Chow et al. (2013) posited that a good understanding of the factors linked to HIV testing uptake among men with multiple sexual partnerships is vital in encouraging HIV testing, that HIV testing is an invaluable strategy in HIV diagnoses, and that HIV testing enhances early identification and timely treatment of infected individuals. Social stigma and undesirable societal attitudes toward HIV-positive individuals have been shown to be responsible for low HIV test uptake among men in Nigeria (Adekeye, 2010; Akhigbe& Bamidele, 2013; Yahaya et al., 2010).In addition, Chow et al. and Shumba, Mapfumo, and Chademana (2011) investigated the model of HIV testing and multiple sexual partnerships among men.

Studies have shown that the high incidence of HIV among men in Nigeria has resulted from factors such as multiple sexual partnerships, youthful exuberance, and low condom use (Ibrahim et al., 2013; WHO, 2006). However, there is no strong evidence suggesting that people change their behavior by engaging in safer sex after knowing their HIV status (Bassett et al., 2007). Weinhardt, Carey, Johnson, and Bickham (1999) conducted a meta-analysis of 27 studies on the impacts of HCT and found that individuals' knowledge of their HIV status had no effect on reducing their number of sexual partners.Carter (2016) and Kalichman, Ntseane, Nthomang, Segwabe, Phorano,

andSimbay (2007) concluded that men with multiple sexual partners were likely to have little or no contact with HIV testing. According to Mhlongo, Dietrich, Otwombe, Robertson, Coates, andGray (2013), there is a need to look at factors associated with HIV testing among men in Nigeria so that sexually active men, especially those with multiple sexual partners, can be available for HIV testing.

The sample for the survey was selected through a stratified three-stage cluster design consisting of 904 clusters, 372 in urban areas and 532 in rural areas (see National Population Commission & ICF, 2014; Population.gov.ng., 2017). The objective of this study was to examine the sociodemographic characteristics associated with multiple sexual partnerships, low HIV test uptake among men in Nigeria, and the relationship between HIV test uptake and multiple sexual partnerships among men in Nigeria. Also, I examined the relationship between knowledge of HIV and attitude toward safer sex and multiple sexual partnerships. In the literature review, I describe the HIV/AIDS epidemic around the world and examine demographic determinants of HIV testing, importance of HIV testing, barriers of HIV testing, multiple sexual partners, culture and religion, HIV knowledge and behavioral change. Later in Section 1, I provide definitions of major terms, study assumptions, scope and delimitations, and the significance of the study. I conclude with a summary.

Outline of the HIV Epidemic Around the World

An estimated 36.7 million people are currently HIV positive globally with a HIV prevalence of 0.8% (Avert, 2017; UNAIDS, 2017). Since the start of the HIV epidemic in 1981, approximately 78 million people have been infected and 35 million have died of

AIDS-related illnesses (Avert, 2017; UNAIDS, 2017). Globally in 2015, there were about 2.1 million new HIV infections at the rate of 5,700 infections per day; 150,000 of infected individuals were children, most of whom got infected by their infected mothers during pregnancy, childbirth, or breastfeeding in sub-Saharan Africa (Avert, 2017, UNAIDS, 2016). Approximately 40% of people globally who live with HIV are not aware of their HIV status (Avert, 2017; UNAIDS, 2016).

Sub-Saharan Africa is home to about 13% of the world's population, and it is the most affected region of the world with about 70% of people living with HIV (Avert, 2017; Kaiser Family Foundation, 2017; UNAIDS, 2017). Though new cases have been reported in all regions of the world, an estimated 25.5 million people living with HIV live in sub-Saharan Africa, where people are more likely to die of HIV-related diseases than any other cause of death (Avert, 2017; UNAIDS, 2017). South Africa has the highest number of people who are HIV positive in the world, while Swaziland has the highest prevalence of 28.8% (Kaiser Family Foundation, 2017).Nigeria has the third highest global HIV burden with 9% of the world's HIV positive population, and most infected individuals are unaware of being HIV positive (Avert, 2016a; Chemaitelly et al.,, 2011; Mucheke, 2016; NACA, 2015).

AIDS was first reported in Nigeria in 1985, and the first diagnosed case occurred in Lagos in a 13 year-old-girl who migrated from one of the West African countries (Awofala&Ogundele, 2016; Eze, 2009; Mafeni&Fajemisin, 2003). The news of the first AIDS case was received with doubt and disbelief by Nigerians. It caused panic among the populace because AIDS was seen as a disease of American homosexuals, and many

youths were cynical about its presence in Nigeria (Awofala&Ogundele, 2018; Eze, 2009). Because the first AIDS victim was a migrant sex worker, many Nigerians believed that AIDS was a foreign disease that could not affect them. This erroneous belief led to neglect, uncertainty, and government denial of the threat posed by the disease (Awofala&Ogundele, 2018; Mafeni&Fajemisin, 2003). Also, the wrong perception of the people about HIV and the deep cultural and religious belief on death as a necessary end to all humans fueled the spread of the disease across the nation (Awofala&Ogundele, 2018; Mafeni&Fajemisin, 2003).

An estimated 3.4 million people in Nigeria are living with HIV, including 34,563 people who do not know they are infected (Avert, 2017; UNAIDS, 2017). In 2013, 4,077,663 people were reported to have been tested for HIV (CDC, 2017a; Nigeria Health Watch, 2017; UNAIDS, 2017). An estimated 120,000 Nigerians died of AIDS-related diseases in 2013, with 220,000 new infections. HIV prevalence among adults ages 15-49 is 3.1% in Nigeria (Avert, 2017; UNAIDS, 2017). In 1991, antenatal care sentinel surveys were adopted to monitor the HIV epidemic, and a sentinel survey was conducted among pregnant women ages 15-49 years who were attending antenatal care to track HIV prevalence (Ibrahim et al, 2013; Nigerian Health Watch, 20017; Population.gov.ng., 2017). The sentinel survey showed an HIV prevalence of 1.8% (National Population Commission and ICF International, 2013; Nigerian Health Watch, 2017) as shown in Appendix A and B.

Overview of HIV Testing

HIV testing is both a preventive step and a compelling tool used to retard HIV epidemic and decrease the rate of new infections (Rucker, 2010). HIV testing provides information on individuals' status and can serve as a way to access treatment that may slow down progression of infection and reduce mortality and serious health consequences (CDC, 2017a). It enhances safe sex practices by infected persons and helps uninfected persons access to preventive measures (Rucker, 2010). HIV testing should be recommended that people between the ages of 13 and 64 years get tested for HIV at least once a year for routine health care and those with risk factors get tested annually (CDC 2017a). In 2013, about 4,077,663 people were reported to have been tested for HIV (CDC, 2017a; UNAIDS, 2017). Annually, about 35,000 people are diagnosed with HIV and 28% of new HIV infections are transmitted by people who are living with undiagnosed HIV. In Nigeria, both the National AIDS and Reproductive Health Survey and National Demographic and Health Survey indicate 94% awareness and 72% willingness go for HIV test across demographic and social status.

The percentage of adults who get tested for HIV has increased globally and despite the concerted effort by stakeholders and the existence of series of HIV testing and counseling services such as voluntary counseling and testing (VCT), couples voluntary counseling and testing (CVCT), mobile testing, and community and home-based testing, the knowledge of HIV status is still disappointingly low among men (WHO, 2009). Knowledge of HIV test determinants among men is essential to support men's health and the fact that women's risk of HIV infection is high in marriage and can help reduce HIV

transmission among sexual partners (Amaro, 1985; Pulerwitz, Izazola-Licea, &Gortmaker, 2001; Stephenson et al., 2013; Smith, 2007). Findings have shown that men have different driving forces for testing than women (Obermeyer & Osborn, 2007). Identifying factors that influences men's testing behaviors is essential in designing HIV testing interventions and tackling gender gaps in HIV testing uptake (Stephenson et al., 2013). Undiagnosed HIV can result in increased morbidity and mortality, increase HIV spread, impacts negatively on national health budget, and impose extra cost on health care providers (O'Connor &Manshi, 2016).

Demographic Determinants of HIV Testing

Men have less acceptance of HIV testing and knowledge of HIV status than their female counterparts (Bassett et al., 2008); Peltzer et al., 2009). There are conflicting studies on age as a forecaster of HIV testing. Brown and his friends (2007) established that men in the age group 24 years old and below are more likely to accept HIV testing than men in the higher age group. Equally, advanced age has been linked with approval of HIV testing and awareness of HIV status (Gage & Ali, 2005; Mwamburi, et al., 2005).

There is correlation between higher education and high HIV testing and awareness of HIV status (Bassett et al., 2008; Peltzer et al., 2009). Also there are conflicting reports on employment as determinant of HIV testing. Kalichman and Simbayi (2003) and De Paoli et al. (2004) argued that employment has no considerable link with the acceptance of HIV testing and counseling, while Nöthling and Kagee (2013) opined that employment and wage have great influence on knowledge of HIV status. In South Africa, race has been identified as a predictor of awareness of HIV status and that

whites are more likely to be aware of their HIV status than blacks (Peltzer et al., 2009). De Paoli et al. (2004) further stated that age has no link with knowledge of HIV status.

Importance of HIV Testing

HIV testing has been shown to effectively reduce HIV infection and advance changes toward safer sex behavior among Nigerian population (NACA, 2015). HIV testing enables people who know they are infected get HIV treatment that can keep them healthy for a long period. Research has shown that people living with HIV benefit from antiretroviral drug, because it lowers the level of HIV in the blood, decreases the rate of spread to others and reduces HIV related illness. Study indicates that taking ART appropriately can reduce infected person's chance of transmitting HIV by 90% (CDC, 2017a). HIV testing helps people who get tested and learn they are negative to make positive decision about sex, drug use, and health care that can protect them from HIV infection. Knowledge of HIV status helps individual to make specific decision about adopting safer sex practice to reduce the risk of contracting or transmitting HIV. It enables people who are HIV positive adopt healthy behavior to protect sexual partners and to access treatment services (CDC, 2017a; Population.gov.ng., 2017).

Types of HIV Tests

In Nigeria, HIV testing employs antibody-detecting techniques such as enzyme-linked immunosorbent assay (ELISA). Though HIV tests are accurate, but the tests cannot detect virus immediately after infection. The type of test used is an important factor in determining how soon a test can detect HIV infections (CDC 2017a). Each test has a window period, which is the time between when a person get HIV and test can

accurately detect HIV (HIV/AIDS Info, 2017). The two types of tests carried out are simple and rapid tests. Rapid tests are fast, simple, and accurate. It takes about 15-30 minutes to perform and can be carried out without laboratories. Simple tests are similar to rapid test and generally based on same principle as ELISA, but takes about 30–35 minutes to conduct (FMoH, 2011). Testing is carried out in both public and private health facilities which include tertiary health facilities such as the teaching hospitals, federal medical centers, and research institutes; secondary health facilities such as general hospitals, and state specialist hospitals; primary health clinics such as community health centers, NGOs, health posts, and mobile clinics (FMoH, 2011). Testing also includes home testing and mobile testing (Kyaddondo, Wanyenze, Kinsman, & Hardon, 2012; Wilbroad, Michelo, Jurgensen, &Fylkesnes, 2010).

Barriers to HIV Testing

Stigmatization, humiliation, inadequate testing centers, difficulty in accessing health centers from rural areas has been identified as barriers to HIV testing (Wiegand, 2012). O'Connor and Manshi (2016), in a literature review of international studies that investigated barriers to early HIV testing from the perspectives of both patients and healthcare professionals identified demographic factors such as age, sex, ethnicity, fear and stigma associated with an HIV diagnosis, individual risk appraisal, structural and organizational barriers within the healthcare system as possible reasons for low HIV uptake globally. These findings were corroborated by Logie et al. (2017) and Wiegand (2012) in separate studies carried out in Jamaica and Zambia respectively where they opined that staff overbearing, lack of privacy, weak infrastructure, shortage of HIV test

kits, weak supply chain, stigma, and low HIV perception are factors responsible for low HIV test uptake. Conversely, access to HIV testing, social support, and awareness of HIV were shown to be key factors advancing increase participation in HIV test (Logie et al., 2017).

Multiple Sexual Partnerships, Culture, and Religion

HIV is strongly linked with multiple sexual partnerships because it's associated with bacteria vaginosis and high incidence of sexually transmitted infections which are risk factors in HIV transmission (CDC, 2011; CDC, 2017a; Terrence Higgins Trust, 2017).The 2013 NDHS indicates that multiple and concomitant sexual partnerships, low level of awareness of individual risk, inadequate treatment for sexually transmitted infections, poor access to quality health care services, gender inequality, poverty, stigma, and discrimination are factors promoting the spread of HIV.Men's multiple sexual partnerships make them vulnerable to HIV infections in sub-Saharan Africa. The dominance of men over women in this region, and their control over economic resources are key promoters of multiple sexual partnerships (Bingenheimer, 2010). To explain the reasons for high HIV prevalence in sub-Saharan Africa, Cohen (2014), Lurie (2006), and Onoya et al. (2014) proposed poverty, migration, untreated sexually transmitted infections, multiple sex partners, and lack of male circumcision as drivers of HIV epidemic.

Different studies have shown that high HIV incidence and prevalence in sub-Saharan Africa are pushed by high levels of multiple sexual partners (Leclerc-Madlala, 2008; Mah& Halperin, 2008; Morris &Kretzchmar, 2008; Onoya et al., 2014). Multiple

sexual partnerships increase the risk of HIV infections (Althoff, Anderson-Smits, Kovacs, Salinas, Hembling, Schmidit, & Kissinger, 2013).

A study in South Africarevealed that multiple sexual partnerships is more pronounced in men than women with younger men reporting more sexual partners compared with their older counterparts (Onoya et al., 2014). Also, individuals reporting multiple sexual partnerships are more likely to be HIV positive especially among men ages 15–49 years (Cohen, 2014; Onoya et al., 2014). In Nigeria, different factors influencing multiple sexual partnerships include poverty, urbanization, modernization, cultural changes, and migration (Dimbuene et al., 2014; Olaniran et al., 2013 Udigwe et al., 2014).

Polygamy is widely practiced in Nigeria and this has encouraged men to search for multiple sexual partners. Culture and tradition allow men especially the Yorubas in the western part of Nigeria to marry more than one wife; also, in the Muslim dominated northern states and parts of the south, religion allows men to marry more than one wife (Taiwo, 2000). During pregnancy and breast feeding, sex is forbidden in some culture and the attendant effects are that married men are denied of their sexual right by their spouses for a long period of time, which encourages men to search for sex elsewhere (Lawoyin& Larsen, 2002; Taiwo, 2000). Lawoyin and Larsen (2002) in a community-based study conducted using 3,204 married men randomly selected in Nigeria showed that polygamous men, those under 30 years in the urban area, and men with low or no education were more likely to have sex with other women anytime their wives were pregnant. Information on multiple sexual partnerships and practice of protected sex are

important in HIV/AIDS prevention and to monitor programs aimed at halting new infections (National Population Commission and ICF, 2013; Population.gov.ng., 2017).

HIV Knowledge and Behavioral Change

There is a high level of HIV awareness in Nigeria among men ages 15-49 years (National Population Commission and ICF, 2013). An estimated 97% of men have heard of HIV/AIDS and HIV awareness is widespread among urban men, but lower among men in the remote areas (National Population Commission and ICF, 2013; Population.gov.ng., 2017). Since the scale up programs began in 2001, there have been increases in the number of men ages 15-49 who has heard of AIDS as a result of increased government and other stakeholders' efforts at halting the spread of HIV (National Population Commission and ICF, 2013; Population.gov.ng., 2017). In addition, an estimated 74% of men are aware that using condom correctly can reduce the spread of the disease. Also, 85% of men know that having sexual intercourse with only one uninfected partner who does not have any other sexual partner can reduce the likelihood of contracting HIV (National Population Commission and ICF, 2013; Population.gov.ng., 2017). The 2013 NHDS show that men in the cities are more likely to be more informed about HIV prevention program than those in the villages (Population.gov.ng., 2017).

In addition, it is important to state that 67% of women and 75% of men are aware that a good looking person can be HIV positive, and that HIV cannot be transmitted by kissing, sharing food with infected person, and by supernatural means (National Population Commission and ICF, 2013; Population.gov.ng., 2017). HIV education and knowledge are important in the fight against HIV. Lack of knowledge puts sexual

partners at the risk of contracting HIV because majority of people do not know their sexual partners HIV status (Bachanas et al., 2013). It is hoped that a centrally accepted HIV testing will create the opportunity for men to modify their sexual behavior, adopt safer sex practices and identify and act on health needs (Bachanas et al., 2013). There is no strong evidence suggesting that people change their behavior by engaging in safer sex after knowing their HIV status (Bassett, 2002).Weinhardt et al., (1999), in a meta analysis of 27 studies on the impacts of VCT, reported that knowing ones HIV status has no effect on reducing the number of sexual partners. However, it is believed that VCT has the potential to reduce stigma and discrimination for people who go for HIV testing (Bassett, 2002). Because HIV testing is highly stigmatized in Nigeria, it is therefore, necessary to make HIV testing both socially and culturally relevant so that it will not aggravate the existing stigma and discrimination associated with HIV infection (Bassett et al., 2002).

Definitions of Terms

Attitude: Attitude is an inclination or a propensity to act in response positively or negatively towards a certain idea, object, person, or situation. It persuades people's choice of action, and responses to situations. In this context, attitude such as a woman refusing to have sexual intercourse with her husband if she knows he had sex with another woman will be examined (Population.gov.ng., 2017).

HIV and AIDS: HIV means human immunodeficiency virus (HIV) and was first reported in 1981. It is the virus that causes AIDS. The virus infect cells of the immune system, and damage the functions of the immune system which result in weakening and deterioration of the immune system leading to immune deficiency (WHO, 2017). The

immune system is believed to be deficient when it stops functioning as body defense against infections and diseases (WHO, 2017). HIV currently has no cure, therefore, evidence based intervention on prevention are key to halting the spread. On the other hand, AIDS means acquired immunodeficiency syndrome (AIDS). The syndrome describes the complex stages of HIV infections. AIDS is identified by the presence of over twenty opportunistic infections (WHO, 2017). The time taken for those infected with HIV to develop AIDS varies between individuals. In most cases, people infected with HIV develop symptoms of HIV related diseases within 5-10 years, however, the length of time between HIV infection and an AIDS diagnosis is generally between 10–15 years (WHO, 2017).

HIV Counseling and Testing (HCT): HCT is a process. It is practices where people go through counseling that will allow them make informed decision on HIV test. It allows individual access to confidential discussions on HIV risks and gain knowledge on how to handle being HIV positive or negative to prevent the spread of the disease. HCT entails a pre test counseling, post test counseling, and follow up counseling.

Multiple sexual partnerships: Multiple sexual partnerships is a high risk sexual behavior, because it increases the risk of HIV transmission via a sexual network (Shisana, Sinbyi, Rehle, & Zuma, 2009; Zacharie, Jacques, & Osman, 2014). It connotes engaging in sexual actions with more than one person within a particular period.Sexual activity with multiple sex partners can occur in sequence or concurrently and includes sexual activities between individuals of same sex. Teenagers, having, multiple sexual partners is

an indicator used by Centers for Disease Control and Prevention to appraise risky sexual behavior in adolescents (Shisana et al., 2009; Zacharie, et al., 2014).

Assumptions

In any scientific research, making specific assumptions forms a major component. In order to make this study ethical and gain wider acceptance, the following assumptions were made. The study assumed that the organizers of the 2013 NDHS obtained informed consent from the respondents. Also, it was assumed that the questionnaires used to collect data were pre-tested before the commencement of the survey to ascertain its validity and reliability to make the findings credible.

In addition, it was assumed that data collected are credible and valid based on the credibility of the stakeholders involved in the survey. DFID, UNFPA, and USAID have a long standing track record of collecting credible data and carrying out quality research. Assumption was also made based on the fact that the respondent understood questions on the research instrument and that questions were answered appropriately.

Scope and Delimitations

In this study, I used the 2013 NDHS data. The study mirrors the entire Nigerian population because sample was collected from a specific study area that was generalized to the entire population. A sample is a smaller unit of a population collected for the purpose of investigation to determine the truth of such population. A sample must be a representative of the population so that results can be generalizes in the wider population from which it's drawn (Frankfort-Nachmias&Nachmias, 2008). The target population for this study comprises men aged 15–49 irrespective of marital status, ethnicity and

religious. Consequently, after applying weighting factor to the sampling frame in the dataset, a sample size of 17,359 men will be used for the study.Nigeria is divided into 36 states with each state sub-divided into local government areas (Population.gov.ng., 2017). There are 36 states and 774 local government areas in Nigeria. In addition, the 36 states are grouped into six geographical areas called zones.

Particularly in this study I examined the low level of HIV test uptake among men with multiple sexual partnerships in Nigeria with the specific objectives to determine the level of Nigerian men participation in HIV testing, examined the suitability of the HBM in understanding and foretelling HIV testing purpose, and classified the socio-demographic characteristics that are significantly associated with multiple sexual partnerships. Also, I also investigated the relationship between multiple sexual partnerships and knowledge of HIV, religious beliefs, and attitudes toward sex. The delimitations of the study included sexual partners in last twelve months, age at first sexual encounter, attitude towards sex, HIV text, religious beliefs, income, and education level. This study is expected to play a significant role in program planning and implementation of behavior related intervention to advance men participation in HIV uptake in Nigeria.

Significance, Summary, and Conclusion

The outcome of this study may play a significant role in evaluating the success and failure of HIV testing in Nigeria. At the level of organizations, findings of the study may be useful to partners in HIV prevention in Nigeria to design programs that will promote HIV testing not only among men in the country, but also in the entire society. At

the societal and policy level, the findings may enhance health information system by providing information on socio-economic determinants of health, health status, and help policy makers to make evidence based decisions. In addition, it may help to build infrastructure by expanding HCT centers, providing adequate logistics, and equipping hospitals with trained personnel. Similarly, the findings of the study may enhance the incorporation of health behavior theories in programs related to HIV prevention and provide evidence that is scientifically based in solving HIV problems.

The global standard approach to HIV prevention which is referred to as "*Minimum Prevention Package of Intervention (MPPI"* in Nigeria by the National Agency for the Control of AIDS (NACA) has three core areas of delivery: namely, structural, behavioral, and biomedical interventions (NACA, 2012). A sound evaluation of this strategy is critical in order to make informed decision on any program or intervention. The relationship between HIV test uptake (biomedical) and multiple sexual partnerships (behavioral) was examined with a view to understanding the effectiveness of counseling during HIV testing and counseling (HTC) and behavioral change communication (BCC) programs as well as HIV status knowledge in influencing changes in people's sexual behavior (NACA, 2014; NACA, 2015).

In addition, this section reviews HIV infection globally with emphasis on sub-Saharan Africa and Nigeria in particular. It examines HIV testing, types of HIV tests, barriers to testing and importance of HIV testing. Also, the section describes multiple sexual partnerships with focus on causes, effects on HIV transmission, and its socio-demographic characteristics. It also examines the influence of knowing HIV status on

multiple sexual partnerships. The last part discusses the constructs of HBM as it relates to HIV testing behaviors, and number of sex partners. The section revealed that many researchers in Nigeria have focused on the general population who are at low risk of transmitting HIV, or selected risk groups such as commercial sex workers, men who have sex with men, intravenous drug users. Even though, investigation of these selected populations is essential, however, such investigation should be broadened to other high risk groups such as men with multiple sexual partnerships because such behavior fuels the spread of HIV. Nigerians are sexually active with the average age at sex entrance of 19.4 years, 17.6 years for women and 21.1 years for men (Population.gov.ng., 2017; UNAIDS, 2014; WHO, 2014). With 80% of new infections caused by exposed heterosexual sex and low HIV testing uptake of 23% in males and 29% in females (Avert, 2016a; UNAIDS, 2014), it is essential to examine the factors responsible for low HIV test uptake in the country.

HCT is a confidential service rendered to people in order for them to know their HIV status, which could be either positive or negative. HCT is a vital part of HIV/AIDS and without HCT, diagnosing HIV may not be possible except when an individual comes down seriously with some of the known symptoms of the disease (NACA, 2017). In Nigeria, NACA is saddled with the responsibility of using all strategy available to increase HCT uptake. This NACA has done by ensuring that all patients that come in to health facility have free access to HCT services (NACA, 2017). Although there was increase in HCT centers in the last decade, uptake has been continually low. Statistics show that HIV has spread extensively in urban and rural areas of Nigeria. Approximately

77% of the total 17,359 men sampled had never been tested for HIV as at the time of the survey (National Population Commission (NPC) [Nigeria] and ICF International, 2014). In addition, multiple sexual partners fuel HIV spread and have been shown to be one of the means by which HIV infection spreads in Nigeria (NACA, 2015; Dimbuene et al., 2014; UNAIDS, 2009; Fatusi& Wang, 2009). Section 2 will focus on study design, sampling and sampling procedure, methodology, the instrumentation and operationalization of constructs, operationalizaton of variables, data analysis plan, threats to both internal and external validity, and ethical procedure.

Section 2: Research Design and Data Collection

The purpose of this study was to examine the extent to which sociodemographic characteristics such as age, residence, religion, marital status, and economic and educational level are associated with multiple sexual partnerships among men in Nigeria. In addition, I examined the relationship between HIV test uptake and multiple sexual partnerships among men in Nigeria, and also the relationship between knowledge of HIV reduction, attitude such as a woman refusing to have sexual intercourse with her husband if she knows he has sex with another woman (Population.gov.ng., 2017), and number of multiple sexual partners. I used secondary data from the 2013 NDHS.In Section 2, I describe the research design and rationale, population, sampling and sampling procedures, procedure for recruiting participants, data collection, instrumentation and operationalization of constructs, data analysis, validity threats, and ethical procedures.

Research Design and Rationale

I used a quantitative research design to provide insight into factors associated with HIV testing and ways in which Nigerian men ages 15-49 might be encouraged to seek healthy sexual health care. Findings may provide a better understanding of HIV testing practices among men in Nigeria and enhance the strength and reliability of the relationship found in the survey data analysis. The quantitative data were obtained from the 2013 NDHS, a national sample survey that provides up-to-date information on background characteristics of the respondents (Population.gov.ng., 2017). The NDHS was designed to provide data to observe the population and health situation in Nigeria with the aim of providing reliable information about maternal and child health and family

planning services (Population.gov.ng., 2017; World Bank, 2018). The survey is a Nigerian version of the 5-year periodical Demographic and Health Surveys sponsored by the United States AIDS for International Development with technical support by ICF macro. The 2013 NDHS was a cross-sectional method designed to collect information on population and health indicators at the national, zonal, and state levels (Population.gov.ng., 2017). Cross-sectional study makes use of different groups with diverse interest although belonging to the same tribe, educational groups, and socioeconomic groups, and describes the characteristics that are available in a society (Cherry, 2015). Cross-sectional study is cheap and simple to conduct, provides data representative of the population, is used in creating hypotheses, and serves as a snapshot of a population at a point in time (Cherry, 2015).

The quantitative variables such as independent, dependent, and prediction variables were used to formulate the three research questions and six hypotheses. The independent variables for the first research question were age, residence, religion, marital status, economic level, and educational level. The dependent variable was the number of multiple sexual partnerships. In the second research question, the dependent variable was the number of multiple sexual partnerships, and the independent variable was HIV testing. In the third research question, the independent variables were HIV knowledge and attitude such as a woman refusing to have sexual intercourse with her husband if she knows he has sex with other women, and the dependent variable was the number of multiple sexual partnerships. Attitude was measured using the 2013 NDHS attitude subscale in which attitude such as a woman refusing to have sexual intercourse with her

husband if she knows he has sex with another women was evaluated by the 2013 NDHS sexual risk behavior subscale, and knowledge of HIV was evaluated by 2013 NDHS knowledge subscale.

There were limitations in the study. This permission required from different authorities concerned with data collection and obtaining consent to use the data took some time. There may have been impediments to regular data collection particularly in the northern region of Nigeria where religion and insurgency pose a threat to the field officers.

Methodology

Population

Population is a collection of units, and a challenge in statistics is obtaining information about a population without examining every unit in the population (Berkeley Education, 2013). The study area of this research was the Federal Republic of Nigeria. Nigeria is the most populous nations in the world with a population of over 180 million people (National Population Commission, 2014). The country shares borders with the Niger Republic in the North, Cameroun and Republic of Chad in the East, the Republic of Benin in the West, and the Atlantic Ocean in the South. Nigeria covers a total surface area of 923, 768 km and 800 km of coast line and lies within latitudes 4° 1’ and 13º 9’ North and longitudes 2º 2’ and 14º 30’ East (NACA, 2014). Nigeria occupies a total surface area of about 923,768 square kilometers and 800km of coast line.

For administrative purposes, Nigeria is divided into 36 states, the Federal Capital Territory, and 774 Local Government Areas. The states are grouped into six geopolitical

zones as North East, North West, North Central, South West, South East, and South-South (NACA, 2014). There are more than 250 ethnic groups in Nigeria with over 500 indigenous languages (NACA, 2014). Nigeria's official language is English, while Hausa, Yoruba, and Igbo are the three major local languages spoken across the nation (NACA, 2014). The country has been ravaged by the HIV/AIDS epidemic since its emergence in 1981 (USAIDS, 2014).

Sampling and Sampling Procedure

Sample refers to a smaller unit of a population for the purpose of study to ensure that results can be generalized to the wider population from which the sample is drawn (Frankfort-Nachimias&Nachimias, 2008). Gathering information about a population without examining every unit of the population is essential in research (Berkeley Education, 2013). According to the 2013 NDHS survey, the sample consisted of 17,359 men. Using this sample instead of focusing on the entire population enabled the investigators to gather sufficient information on the population at a reduced cost.

Sample size is the number of sample units to be collected and many times sample size and power pose challenges to an investigator (Berkeley Education, 2013). Sample size influences whether the research findings can be generalized for the entire population. A small sample size helps to reduce the cost, time, and resources for collecting data. In quantitative study, correct sample size is important because sample size determines its power and can also be determined mathematically from standard deviation and standard error (Frankfort-Nachmias&Nachmias, 2008). To reduce bias it is important that proper procedure is carried out because poor design can result in bias. A good sampling strategy

has a significant effect on the success or failure of quantitative research because it regulates the decision on which unit comprise the sample. It is vital to the precision and consistency of the results (Frankfort-Nachmias&Nachmias, 2008).

The 2013 NDHS sample used for this study was a stratified sample; the sample was selected independently in three stages from the sampling frame to achieve satisfaction by separating each of the 36 states into rural and urban areas (Population.gov.ng., 2017). The survey sample frame consists of the enumeration areas (EAs), prepared for the 2006 population census of the federal republic of Nigeria (Population.gov.ng., 2017). In the first stage, 893 areas were selected with probabilities proportional to size and with independent selection in each sampling stratum. The second stage has one EA randomly selected from most of the selected areas with equal probability selection (Population.gov.ng., 2017). Larger areas have more than one EA selected and in all 904 EAs were selected. Having selected the EAs, household listing operation was done in all the selected EAs just before the major survey. The household listing was done by visiting each of the 904 selected EAs, drawing a location map and sketching a comprehensive map (Population.gov.ng., 2017). This was followed by recording in the household listing forms all residential households found in the EA, address and name of the head of each household.

The household lists serve as the sampling frame for the selection of households in the third stage. Selection in the third stage consists of a fixed number of 45 households in each rural and urban cluster through equal probability sampling on the newly updated household listing. The sample allocation was characterized by equal size allocation with

little adjustment. The highly populated states of Lagos and Kano were assigned the largest size with 40 clusters each, while the remaining states had 23 or 24 clusters each. There were 372 clusters in urban areas and 532 clusters in rural areas. In all, 40,608 households were sampled consisting of 16,740 in urban areas and 23,940 in rural areas. Considering the large size of Nigeria, population sampling was done for a specific purpose because it is difficult to conduct a research on each element of the target population. A study on the entire Nigeria population would have been costly and locating individuals in the population would have posed a serious challenge. This sample procedure was carried out to ensure that the selected sample size could effectively represent the target population, which is a test for validity.

Sampling is a procedure utilized in a research to select research units such as people and organization from a population of interest so that by studying the sample, result can be generalized back to the population from which they were drawn (Web Centre For Social Research Methods, 2006). Besides, there are two types of sample designs, namely probability and non-probability. Non-probability sampling is a statistical technique where the samples are gathered in a process that does not give all the individuals in the population equal chances of being selected. Samples are usually selected on the basis of their necessity. Non random probability will be useful in my plan because randomization of the men may not be possible (Explorable, 2009). Equally, the procedure for selecting sample units for inclusion may not be difficult to attain.

The sample for the 2013 NDHS was national representative and covers the entire population residing in non- institutional dwellings units in Nigeria. The survey used three

key questionnaires which includes Household Questionnaire, Woman's Questionnaire, and Man's Questionnaires. Because Nigeria has different ethnic groups and languages, for efficient data collection, questionnaires were translated into the three major languages in Nigeria, namely Yoruba, Hausa and Igbo. All participants in the survey filled inform consent form to make sure that the study is in line with ethic principles. The household questionnaire collects information on household and visitors, age, sex, relationship to the head of the household, education, parental survivorship and residence, and birth registration (The DHSProgram, 2014), while the man's questionnaire collects information on age, education, employment status, marital status, media exposure, and place of residence reproduction,knowledge and use of contraception,employment and gender roles, HIV and other sexually transmitted infections and other health issues such as circumcision, injections, use of tobacco, health insurance, and health and care for their children (The DHSProgram, 2014). Permission to use the data for this study was obtained from Opinion Research Corporation (ORC) Macro International Incorporated, Calverton, USA. Equally, the consent for survey procedure and instruments were previously approved by the National Ethics Committee of Federal Ministry of Health, Nigeria and the Ethics Committee of ORC Macro Inc.

Sample size power analysis conducted in G 3.15 and a medium effect size of F= 0.15 were used and total sample size of 17,359 men were successfully obtained by the survey. Multiple linear regressions were used to assess the research questions. The medium effect size was necessary to allow a maximum power level in the detection of any realized effect. In addressing the independent variables an alpha value of 0.05 and

power of 0.80 were used. The level of significance of 0.05 was set at 95% confidence interval and 80% power.

Instrumentation and Operationalization of Constructs

The research instrument used for this study was developed by Scott in 1987 to measure International demographic health survey. The research instrument was designed to help developing nations collect accurate data on issues such as family planning, HIV/AIDS, maternal health, fertility, and child health and to ensure that collection, analysis and evaluation of data is enhanced. In the survey, the application of the instrument ensured partnership and coordination among major stakeholders. The research instrument was questionnaire. Questionnaire is a paper and pencil instrument which is a self report data collection instrument filled by study participants. It is of two types, open ended and closed ended questionnaires. Questionnaire is good for measuring attitudes and can be administered to a group. Because of its high reliability and validity, it eases analysis of data. Also, it is used for both explanation and confirmation of results. Its open ended nature help in providing detailed information and besides it is less expensive. Besides, a questionnaire measure need validation and has non-response to selection bias.

To ensure reliability of data questionnaire needs validation. Questionnaire validation is a procedure where the designer appraises the questionnaire to verify whether it evaluates what it was designed to measure. The stages involved in validating questionnaire includes establishing face validity, do a pilot test and after collecting pilot data, enter response in a spread sheet and clean the data (Methodspace, 2014). This is followed by identifying the basic components using Principal Components Analysis

(PCA) and check for internal consistency by using Cronbach's Alpha (CA). This should be followe by a review the survey based on the information gathered from PCA and CA (Methodspace, 2014). Radhakrishna (2007), opined that the first step in testing a questionnaire involve establishing elements such as the purpose of the study, objective, hypothesis, and research questions. Radhakrishna further stated that identification of variables and questionnaire conceptualization where the theoretical framework or literature review is transformed into questions or statements is the second step.

Reliability of a study is best achieved by looking at the section of the method of the study. This section provides information for researcher working on similar study to repeat it (Frankfort-Nachmias&Nachmias, 2008). This make it necessary for researcher using quantitative research to spell out clearly the sample population, sampling procedure, measurement used and procedure, and measurement instrument (Frankfort-Nachmias&Nachmias, 2008). It is essential to use a measurement that has already been proven to be reliable and valid. This will add strength to the study and making sure sample is representative of the population. It is also important to test the instrument on smaller group prior to the study and frequently reviewing it. In this study, the reliability of the instrument was achieved by the survey pre test on a smaller sample of the target population.

Operationalization of Variables

The first hypothesis in this study sought to examine the association between selected socio-demographic characteristics such as age, residence, religion, marital status, economic level and educational level and multiple sexual partnerships. Equally, the

second hypothesis was to determine the relationship between HIV test uptake and multiple sexual partnerships, while the third hypothesis was to examine the relationship between knowledge of HIV prevention regarding sexual network and multiple sexual partnerships. The dependent variable to be considered is multiple sexual partnerships, while the independent variables are age, residence, religion, marital status, economic level, educational level,HIV test uptake, HIV knowledge, religious beliefs, and attitude.

The variables involved were measured and coded in the NDHS dataset as follows:

1. Age (mv012): this was a ratio scaled variable and was measured as current age of respondents reported in single-year from 15 to 49 years
2. Residence (mv025): this was a nominal scale and was measured as type of place of respondents' residence. It is a dichotomous variable with two options given as "urban" and "rural"
3. Marital status (mv501): marital status was a nominal scaled discrete measurement and was measured as current marital status of the respondents and categorized as "never in union", "married", "living with partner", "widowed", "divorced", and "no longer living together/separated". However, the variable was recorded to bring out the difference between men who were married or living with partner and those who were not. Therefore, the new variable has only three options given as "never in union", "married/living with partner" and "widowed/separated/divorced".
4. Wealth status (mv190): this was a nominal scaled discrete measurement that was measured as "wealth index" and was categorized as "poorest", "poorer",

"middle", "richer" and "richest". The variable was also recoded to avoid empty cells in Chi-square table. The new variable has only three levels given as "poor" (merging poorest and poorer), "middle" and "rich" (merging richer and richest).

5. Education (mv106): education level was an ordinal scaled discrete measurement and was measured as the educational level of the respondents with four levels given as "no education", "primary", "secondary" and "higher".
6. HIV knowledge regarding sexual network (mv754dp): this measured the knowledge of the respondents about prevention of HIV by having only one uninfected partner. It is a dichotomous variable with options given as "yes" and "no"
7. HIV test uptake (mv781): this measured status of ever been tested or screened for HIV in the last 12 months. It is, also, a dichotomous variable with options given as "yes" and "no". The researcher asked respondents if they have ever been tested to see if they have the AIDS virus and get the results of the test.
8. Multiple sexual partnerships (mv766a): this measured the number of sexual partners of the respondents, excluding spouse, in the last 12 months. It was reported in number.
9. Religion (mv130): measured with options given as "Catholic", "other Christians", "Islam", "Traditional", and "others". The variable was recorded

as “Christianity” (merging Catholic and other Christians), “Islam”, and “Traditional & others”.

10. Attitude toward safer sex negotiation (mv633b): this was measured as the opinion of men about the right of women to refuse sex when she knows the husband has sex with other women. It is a dichotomous-response question with options giving “yes” and “no”.
11. Ethnicity (mv131): measured with option given as ‘‘Hausa’’, ‘‘Fulani’,’ ‘Yoruba’’, ‘‘Igbo’’, and ‘‘Kanuri’’.

Data Analysis

The analysis of the data obtained from the 2013NDHS will be performed with STATA version13 statistical package. The analytical procedure involved three levels of data analyses which are: univariate, bivariate and multivariate levels. The statistical analytical techniques employed were frequency tabulation, Chi-square and Logistic Regression. Data analysis techniques are shown in Table 1

Table1

Research Questions, Variables Measured, and Statistical Tests

Research questions	Variables as measured in DHS	Statistical tests
To examine the independence between selected socio-demographic characteristics and multiple sexual partnerships	The socio-demographic characteristics selected are: age(mv012), residence(mv025), marital status(mv501), religion(mv130), ethnicity(mv131), wealth index (mv190) and educational level(mv106) are independent variables, while the dependent variable is multiple sexual partnerships(mv766a)	Chi-square test
To determine the relationship between HIV test uptake and multiple sexual partnerships	HIV test uptake (mv781) is independent variable, while dependent variable is multiple sexual partnerships(mv766a)	Chi-square test
To examine the relationship between knowledge HIV prevention regarding sexual network, attitude toward safer sex negotiation and multiple sexual partnerships	HIV knowledge regarding sexual network(mv754dp) and attitude toward safer sex negotiation (mv633b) are independent variables; while the dependent variable is multiple sexual partnerships(mv766a)	Chi-square and Binary Logistic Regression. The dependent variable will be recoded as dichotomous: Normal sexual behavior=1, multiple sexual partnership=0

Univariate Analysis

At the univariate level of analysis, the distribution of respondents according to socio-demographic variables, multiple sexual partnership, knowledge of and test for HIV were presented using frequency and percentage tabulation.

Bivariate Analysis

The bivariate level dwells on the comparisons of outcome variables and some selected explanatory and socio-demographic variables were made by cross-tabulation and chi-square tests were run where the variables are categorical.

Multivariate Analysis

The multivariate regression method was employed to further analyze the relationship between independent and dependent variables, intervening variables and dependent variable, and combined effect of independent and intervening variables on dependent variable. Binary logistic regression model was used in this study. The model is used when the dependent variables are dichotomous and the independent variables are of any type.

The general logistic regression model used for this study according to Newman (2001) is: $P(Y = 1/\beta) = \frac{e^{\beta_0+\beta_1X_1+.....+\beta_nX_n}}{1+e^{\beta_0+\beta_1X_1+.....+\beta_nX_n}}$

Which computes the probability that the response variable Y is equal to1 subject to the covariate vector: X = ($x_i \ldots x_n$) and parameter vector and parameter vector β = ($\beta_{i.....}\beta_n$). Logistic regression does not predict the value of the dependent variable; it rather gives the expected probability that the dependent variable is unity subject to the settings of the covariates and their estimated parameters. The logistic regression model is also expressed as:

$\text{Log}[y/1-y] = a + b_1X_1 + b_2X_2 + \ldots + b_nX_n + e$, where;

y = multiple sexual partnership

a = the y-intercept of the curve

bs = are the slopes of the curve

X_1 to X_n = are the independent variables in the model and

e = error term which is assumed to sum up to zero

The dependent variable is multiple sexual partnerships. The variable was re-coded by assigning a code of 1 if a man reported more than one sexual partner and 0 if otherwise. The following models were developed to test the relationship at multivariate level of analysis using binary logistic regression:

Model I: showing relationship between multiple sexual partnership and HIV test uptake.

$$\text{Log}[y/1-y] = a + b_1X_1 + b_2X_2 + \ldots + b_nX_n \quad (1)$$

Where;

y = multiple sexual partnership

a = the y-intercept of the curve

bs = are the slopes of the curve

X_1 to X_n= are multiple sexual partnerships and HIV test uptake, while holding sociodemographic variables such as age, residence, religion, marital status, occupation, wealth status and educational level constant.

Model II: Model involving socio-demographic variables

$$\text{Log}[p/1-p] = a + b_1X_1 + b_2X_2 + \ldots + b_nX_n \quad (2)$$

Where;

y = multiple sexual partnerships

a = the y-intercept of the curve

bs = are the slopes of the curve

X_1 to X_n= are the independent variables such as age, religion, ethnicity, residence, marital status, occupation, wealth status, and educational level.

Model III: model controlling for intervening variables

$$Log[y/1-y] = a + b_1X_1 + b_2X_2 + \ldots + b_nX_n \quad (3)$$

Where;

y = multiple sexual partnership

a = the y-intercept of the curve

bs = are the slopes of the curve

X_1 to X_n = are the independent variables such as age, residence, religion, marital status, occupation, wealth status, educational level, HIV test, while holding intervening variables (attitude towards safe sex and knowledge that multiple sexual partners can cause HIV infection) constant. All the analyses were performed at 0.05% significant level (p-value <= 0.05).

Threats to Validity

Validity means the level to which a study maintains the proposed conclusion drawn from the outcome (Brainmass, 2015). Validity is the accuracy with which an instrument or test appraises what it is supposed to evaluate (Fain, 2008). The focus of validity is that research question should be correctly and confidently understood. Validity plays an important role in research design and measurement. Researchers use validity to establish whether a study measures what it proposed to measure and to estimate the reliability of the outcomes (Explorable, 2015).

Threats to External Validity

The essence of external validity is generalization. It measures to what extent an effect in a study can be generalized. In addition to generalization to population, generalization to treatment and measurement variables are equally important. There are various threat to external validity that can make generalization impossible. These factors are selection biases, constructs, methods and confounding, and history effects and maturation.The threat to external validity in this study is irregular measures, which is a threat to construct validity. Construct validity assess the validity of the measurement procedure such as the instrument used to measure a given construct. It includes other forms of validity such as content validity, convergent and divergent validity, and criterion validity that help in the assessment of such construct validity. Reducing different levels of measurement of construct will affect the level of generalization of result (Laerd Dissertation, 2012) and to limit the effect of irregular measures in this study the researchers used a pre-tested instrument to collect data.

Threats to Internal Validity

Internal validity explores the principle of cause and effect. It makes sure that a research design pursues the law of cause and effect and degree to which a research minimizes biases. There are different threat to internal validity such as history effects, maturation, testing effects, instrumentation, statistical regression, selection biases, experimental mortality, causal time order, and imitation of treatments, compensation, compensatory rivalry, demoralization, experimenter effects and subject effects (Laerd Dissertation, 2012). These threats are concerned with the degree of control of the study

design. The presence of confounding variables minimizes internal validity. In this study there is no visible threat to internal validity.

Ethical Procedures

The role of ethics in research is crucial because ethics acts as a link between value and policy. Research ethics should not be an addendum, but ethics should be built into the research process. It is, therefore, important that when planning how to tackle ethical issues and challenges in research, consider the research strategy that you have adopted and the impact this will have on these ethical issues and challenges.Structured and well-defined characteristics of quantitative research designs allow researchers to plan much of the research process before it starts. Data aggregation in quantitative data analysis techniques helps to protect the anonymity of respondents in some cases. Surveys should be designed before the research process starts and since the research method used closed questions where respondents must choose from pre-defined options, most of the potential answers to questions are known in advance. From the perspective of ethics, getting informed consent from respondents becomes easier because the features of the survey process are clear.

This study commenced after obtaining approval from Walden University Institutional Review Board (IRB). This was in accordance with Walden University guidelines on doctoral study. In line with ethical principle, the study was not in any way harmful to the participants. They were equally not put in a position of discomfort. One of the principles of research ethics is the idea of informed consent. Informed consent was obtained from the participants before the study commences. Participants were informed

of their participation in the research and were told what the study requires of them. The purpose of the study, the possible outcome, possible inconveniences was discussed with the participants. Also, the participants were volunteers who were not cajoled into taking part in the study

In addition, the anonymity and confidentiality of participant's data were maintained in the study. Besides, sensitive information can only be obtained from participants if only they are sure that such information will be kept in confidence. The National Population Commission process and store the data. They ensure that the public does not have access to the data and dissemination of data was strictly on permission.

Summary

In this section, I explained in detail how the study will be carried out. An outline of the research design and rationale, methodology, and the role of the researcher for this study were discussed. Equally, I discussed participant selection process, strategies used for selecting participants, the instruments used to collect data. Data collection and data analysis procedures were comprehensive to present a general idea of how data were collected and used to answer the research questions. Employing quantitative research method and a cross sectional design based on a secondary data from 2013 NHDS, I examined the determinants of low HIV text uptake among men in Nigeria. The cross-sectional design was chosen for this study to investigate relationship between target variables, finding the incidence of the target observable fact, and the expected outcome. Secondary data was preferred because of limited resources to conduct a primary data that will be representative of a highly populated country like Nigeria. This study was

conducted in line with conventional ethical standards, and with the permission from IRB. In the next session, Section 3, the result of the study will be presented.

Section 3: Presentation of the Results and Findings

The purpose of this study was to examine the low level of HIV test uptake among men with multiple sexual partnerships in Nigeria and the suitability of health belief model in understanding and predicting HIV test uptake. I also examined the sociodemographic characteristics that were associated with multiple sexual partnerships, and the association between multiple sexual partnerships and knowledge of HIV and attitudes toward sex. The quantitative methodology included objective measurements and statistical analyses of data collected through surveys. The purpose of quantitative methodology is to conduct statistical analysis to generalize findings. Quantitative methods were used to examine the associations between the variables in this study (see University of Surrey, 2015). Also, quantitative methods were used to test the HBM and the three hypotheses in this study.

I analyzed data from the 2013 NDHS. Data were analyzed to determine the association between variables among men ages 15-49 years in Nigeria. The first hypothesis addressed the association between sociodemographic characteristics such as age, residence, religion, ethnicity, marital status, wealth status, and educational level, and multiple sexual partnerships. The second hypothesis addressed the association between HIV test uptake and multiple sexual partnerships, and the third hypothesis addressed the association between knowledge of HIV prevention regarding sexual network and multiple sexual partnerships.

Chi-square was used to evaluate the association between the sociodemographic characteristics such as age, residence, religion, ethnicity, marital status, wealth status, and

educational level, and multiple sexual partnerships. Chi-square was also used to evaluate the association between HIV test uptake and multiple sexual partnerships, and to evaluate the association between knowledge of HIV prevention regarding sexual network and multiple sexual partnerships. Chi-square was used to determine whether there was a significant association between the variables. Binary logistic regression was used to determine whether sociodemographic characteristics, HIV test uptake, knowledge of HIV prevention, and attitude towards safe sex influenced multiple sexual partnerships. Because chi-square is a descriptive test and not a modeling technique, binary logistic regression was used to define the dependent variable and model determinants to make predictions. STATA 15.0 statistical software was used to perform the analyses. Section 3 includes the purpose of this study, research questions and hypotheses, and the time frame for data collection. I also present the research findings.

Research Questions and Hypotheses

RQ1: To what extent are the sociodemographic characteristics such as age, residence, marital status, religion, wealth status, ethnicity, and educational level significantly associated with multiple sexual partnerships among men ages 15-49 in Nigeria?

H_o1: There is no significant association between sociodemographic characteristics and multiple sexual partnerships among men ages 15-49 in Nigeria.

H_a1: There is a significant association between sociodemographic characteristics and multiple sexual partnerships among men ages 15-49 in Nigeria.

RQ2. Is there a statistically significant association between HIV test uptake and multiple sexual partnerships among men ages 15-49 in Nigeria?

H_o2: HIV test uptake is not significantly associated with multiple sexual partnerships among men ages 15-49 in Nigeria.

H_a2: HIV test uptake is significantly associated with multiple sexual partnerships among men ages 15-49 in Nigeria.

RQ3: Is there an association between HIV knowledge and attitudes toward negotiating safer sex and multiple sexual partnerships among men ages 15-49 in Nigeria?

H_o3: There is no association between HIV knowledge and attitudes toward negotiating safer sex and multiple sexual partnerships among men ages 15-49 in Nigeria.

H_a3: There is an association between HIV knowledge and attitudes toward negotiating safer sex and multiple sexual partnerships among men ages 15-49 in Nigeria.

Data Collection of Secondary Data Set

The 2013 NDHS data were appropriate for this study because the quantitative variables such as independent and dependent variables were well captured in the survey. The independent variables captured in the survey were age, residence, religion, ethnicity, marital status, wealth status, educational level,HIV testing, HIV knowledge, and attitude towards safer sex, while the dependent variable was multiple sexual partnerships. These variables were needed to answer the research questions. The data were a stratified sample selected independently in three stages. The survey included information on the awareness and attitudes regarding HIV/AIDS among men in Nigeria. The sample consisted of 17,359 men. The target groups were men ages 15-49 years in randomly selected

households across Nigeria. The survey sample frame consisted of the enumeration areas (EAs) prepared for the 2006 population census of the Federal Republic of Nigeria. In the first stage, 893 areas were selected with probabilities proportional to size and with independent selection in each sampling stratum (Population.gov.ng, 2017; World Bank, 2014).

The second stage had one EA randomly selected from most of the selected areas with equal probability selection. Larger areas had more than one EA selected and in all 904 EAs were selected. Having selected the EAs, household listing operation was done in all of the selected EAs before the major survey (Population.gov.ng, 2017; World Bank, 2014). The household lists served as the sampling frame for the selection of households in the third stage. Selection in the third stage consisted of a fixed number of 45 households in each rural and urban cluster through equal probability sampling on the newly updated household listing. The sample allocation was characterized by equal size allocation with little adjustment. In all, 40,608 households were sampled consisting of 16,740 in urban areas and 23,940 in rural areas (Population.gov.ng, 2017; World Bank, 2014). The sample for the 2013 NDHS was nationally representative and covered the entire population residing in noninstitutional dwellings units in Nigeria.

The 2013 NDHS included three key questionnaires: Household Questionnaire, Woman's Questionnaire, and Man's Questionnaires (World Bank, 2014). The Household Questionnaire consisted of the household schedule and household characteristics. The household schedule was used for this study because it was designed for members of the household and visitors who were respondents in the study. It included information on

household, visitors, age, sex, relationship to the head of the household, education, parental survivorship and residence, and birth registration (Population.gov.ng, 2017; World Bank, 2014). The Man's Questionnaire included information on age, education, employment status, marital status, media exposure, place of residence reproduction,knowledge and use of contraception,employment and gender roles, HIV and other sexually transmitted infections, and other health issues such as circumcision, injections, use of tobacco, health insurance, and health care for their children (Population.gov.ng, 2017; World Bank, 2014).

The fieldwork was launched in six geopolitical zones which enables close effective monitoring of all team members. Fieldwork for the survey was executed by 37 interviewing teams, each team comprised of a supervisor, a field editor, four female interviewers, two male interviewers, and two drivers. Fieldwork was conducted from February 15, 2013, to the end of May, while the teams in Lagos and Kano completed fieldwork in June the same year because of the large size of the two states (Population.gov.ng, 2017;The World Bank, 2014).

Results

Descriptive Statistics

The weighted total sample of Nigerian men in the 2013 NDHS was 17,359. Their ages ranged from 15 years to 49 years with a mean age of 29 years and standard deviation of 10 years. The distribution of the men by age group indicated that more than a third were young adults aged between 15 years and 24 years (37.5%), about two-fifths were in the age group 25–39 years (42.3%); while the oldest category of men aged 40 years and

above were only a fifth of the total men sampled (20.2%). Also, the analysis revealed that more than a half of the men were residing in the rural areas (56.1%) and the remaining 43.9% were dwelling in the urban areas. A third were poor (33.7%), two in five were in the middle wealth class (41.3%); while a quarter were richer (25.0%). Information on marital status showed that a little less than a half were never married (48.3%) and exactly a half were married or living with spouse (50.2%) respectively. Those who were widowed, divorced or separated were only 1.5%. In addition, disaggregation by ethnicity indicated that a third was Hausa, Fulani and Kanuri (34.4%), Yoruba (13.5%) and Igbo (13.4%) were of equal proportions of the sample; while men from other ethnic groups were 38.7%. Also, classification by religious affiliations showed that 47.4% were Christians, a half were Islamic faith adherents (51.6%), and the remaining 1.0% were practicing African traditional religion and other religions. Information on educational level attainment indicated that less than half of the men had attained high school level of education (47.7%), while 16.7% and 14.3% had attained primary school and university levels of education respectively. However, one-fifths had no formal education (21.3%). A summary of respondents' age, types of resident, wealth status, ethnicity, religion, education level, and marital status is presented in Table 2.

Table 2

Sociodemographic Characteristics of Respondents

Characteristics	Frequency *N* =17,359	Percentage (%)
Age of respondents		
15 - 24 years	6,511	37.5
25 - 39 years	7,347	42.3
40 years and older	3,501	20.2
Type of residence		
Urban	7,611	43.9
Rural	9,748	56.1
Wealth status		
Poor	5,854	33.7
Middle	7,172	41.3
Rich	4,332	25.0
Marital status		
Never married	8,378	48.3
Married/living with spouse	8,723	50.2
Widowed/divorced/separated	258	1.5
Ethnicity		
Hausa/Fulani//Kanuri	5,963	34.4
Igbo	2,330	13.4
Yoruba	2,341	13.5
Other	6,724	38.7
Religion		
Christianity	8,195	47.4
Islam	8,907	51.6
African traditional religion/others	178	1.0
Educational level		
No education	3,685	21.3
Basic	2,907	16.7
Secondary	8,281	47.7
Tertiary	2,486	14.3

Sexual Relationships, HIV Knowledge, and HIV Testing

Table 3 shows the sampled men's sexual relationships, attitude towards safer sex negotiation, HIV knowledge, and testing. Grouping the men into categories of HIV

knowledge regarding sexual network showed that majority (93.5%) had the knowledge about prevention of HIV by having only one uninfected partner. Only about one in every twenty had no knowledge about this (6.5%). More than three in every four had never been tested (76.2%), while less than a quarter had ever been tested for HIV (23.8%). One in every five of the men sampled was engaging in sexual activities with more than one woman (21.1%), but more than three-quarters were not engaging in multiple sexual partnerships (78.9%). Similarly, one-fifths was negatively disposed to attitude towards safer-sex a negotiation (23.2%) by raising objection to the opinion that wife is justified to refuse husband sex if husband has other sexual partners. In contrary, more than three-quarters showed positive attitude towards safe-sex negotiation (76.8%).

Table 3

Nigerian Men's Sexual Relationships and HIV Knowledge and Testing

Characteristics	Frequency *N* =17,359	Percentage (%)
HIV knowledge regarding sexual network		
No knowledge	1,022	6.5
Have knowledge	14,700	93.5
HIV testing		
Ever been tested	3,742	23.8
Never been tested	11,976	76.2
Multiple sexual partnerships		
Not multiple	78.9	78.9
Have multiple	21.1	21.1
Attitude towards safer sex negotiation (based on the opinion of men on whether wife is justified refusing husband sex if husband has other women)	3,554	23.2
Negative attitude	11,797	76.8
Positive attitude		

Research Question 1

The chi-square test of association between age and multiple sexual partnerships indicated that the practice of multiple sexual partnerships is statistically associated with age of respondents (χ^2 =458.65, p<0.005). Multiple sexual partnerships were more practiced by younger men (15-24 years=37.5%, 25-39 years=42.3%) than the older men aged 40 years and above (20.2%). Also, multiple sexual partnerships were more prevalent among men who reside in the urban areas (56.1%) than those in the rural areas (43.9%). There is a significant association between types of residence and multiple sexual partnerships among Nigerian men (χ^2 =101.12, p<0.005). The practice of multiple sexual partnerships tends to increase along the way up the ladder of wealth class. The rich were

practicing multiple sexual partnerships the most (29.9%) compared to the men in the average wealth class (24.7%) and those who are poor (8.8%). At both higher classes of wealth status, prevalence of multiple partners triples that of the poor class. Overall, there is a statistically significant association between wealth status of men and practice of multiple sexual partnerships (χ^2 =675.47, p<0.005).

Ethnicity showed a significant association with multiple sexual partnerships (χ^2 =2140.34, p<0.005). Among the ethnic groups in Nigeria, the Hausa men were relatively fair in the practice of multiple sexual partnerships compared to the Igbo (30.9%), the Yoruba (31.5%), and the other ethnic groups (29.2%), which are ten times higher in each than the level among the Hausa men. The association between ethnicity and multiple sexual partnerships is found to be significant (χ^2 =1490.51, p<0.005). Similarly, the prevalent of multiple sexual partnerships among the Christian men (33.6%) is more than triple that of the Muslim men (9.0%). Also, the level is more than twice among the men who were practicing African traditional religion and others (21.5%). Overall, there is a statistically significant association between religion and multiple sexual partnerships (χ^2 =1389.75, p<0.005). The analysis indicated that prevalence of multiple sexual partnerships keeps increasing with higher educational level. Relative to the men who had no education (3.9%), the prevalence was more than five times higher among those who had attained primary education (16.6%) and more than 8 times higher among those who had secondary school education (25.9%). It was about ten times higher among men who had attained tertiary level of education (31.4%). The association between educational level and multiple sexual partnership is significant (χ^2 =797.81, p<0.005). The analysis

showing the association between sociodemographic characteristics and multiple sexual partnerships is presented in Table 4.

Table 4

Chi-Square Analysis Showing the Association Between Sociodemographic Characteristics and Multiple Sexual Partnerships

Socio-demographic characteristics	Multiple sexual partnerships		OR (95%CI)
	Not multiple	Have multiple	
Age of respondents			
15 – 24 years	4,058 (75.9)	1,287 (24.1)	
25 – 39 years	5,069 (74.7)	1,718 (25.3)	
40 years and older	2,976 (92.5)	242 (7.5)	
Type of resident			0.67(0.62-073
Urban	5,309 (75.3)	1,746 (24.7)	
Rural	6,794 (81.9)	1,502 (18.1)	
Wealth status			
Poor	4,334 (91.2)	420 (8.8)	
Average	4,931 (75.3)	1,615 (24.7)	
Rich	2,838 (70.1)	1,213 (29.9)	
Marital status			
Never married	4,531 (63.4)	2,616 (36.6)	
Married/living with spouse	7,442 (93.5)	522 (6.5)	
Widowed/divorced/separated	131 (54.3)	110 (45.7)	
Ethnicity			
Hausa/Fulani//Kanuri	4,904 (96.9)	157 (3.1)	
Igbo	1,500 (69.1)	671 (30.9)	
Yoruba	1,487 (68.5)	683 (31.5)	
Other	4,213 (70.8)	1,737 (29.2)	
Religion			
Christianity	4,961 (66.4)	2,516 (33.6)	
Islam	6,983 (91.0)	688 (9.0)	
African traditional religion/others	107 (78.5)	29 (21.5)	
Educational level			

No education	2,733 (96.1)	111 (3.9)
Primary	2,139 (83.4)	427 (16.6)
High school	5,580 (74.1)	1,955 (25.9)
University	1,651 (68.6)	755 (31.4)

Research Questions 2 and 3

In Table 5, the chi-square analysis shows that there is no significant association between HIV knowledge regarding sexual network and multiple sexual partnerships (χ^2 =0.025, p>0.905). This may result from the fact that chi-square analysis does not need normal distribution. The men did not differ about multiple sexual partnerships across categories of HIV knowledge regarding sexual network. However, there is a significant association between attitude towards safe-sex negotiation and multiple sexual partnerships (χ^2 =202.19, p<0.005). It showed that married men who had no sexual relationship with their wives felt more justified. Also, HIV testing showed significant association with multiple sexual relationships (χ^2 =301.40, p<0.005). Therefore, with preliminary analysis, knowledge of HIV testing was associated with multiple sexual partnership.

Table 5

Chi-Square Analysis Showing the Association Between Nigerian Men's Sexual Relationships, HIV Knowledge and Testing, and Multiple Sexual Partnerships

Variable	Multiple sexual partnerships		OR(95%CI)	χ^2	p-value
	Not multiple	Have multiple			
HIV knowledge regarding sexual network			10.1(8.6,12.0)	0.03	0.91
No knowledge	787 (78.6)	214 (21.4)			
Have knowledge	1,100 (78.9)	3,034 (21.1)			
Attitude towards safer sex negotiation			0.5(0.5,0.6)	202.19	0.00
Negative attitude	2,449 (70.3)	1,055 (29.7)			
Positive attitude	9,604 (81.4)	2,193 (18.6)			
HIV testing			0.5(0.4,0.5)	301.40	0.00
Ever been tested	2,527 (68.7)	1,153 (31.3)			
Never been tested	9,576 (82.1)	2,095 (17.9)			

Multivariate Analysis

The binary logistic regression analysis confirms the significant association earlier established between age and multiple sexual partnerships when chi-square test was performed (OR=4.2, $p<0.05$). Adolescents were 4.2 times more likely to practice multiple sexual partnerships. Being married (OR=0.046, $p<0.05$) and being windowed/divorced/separated (OR=0.62, $P<0.05$) are 96.4% and 38.0% less likely than being never married (RC) for men in Nigeria to engage in multiple sexual partnerships. Relative to being a Hausa man (RC), being an Igbo (OR=4.9, $p<0.05$), being a Yoruba

(OR=10.1), and being a man from the other ethnic groups (OR=7.6, $p<0.05$) are more likely for a Nigerian man to engage in multiple sexual partnerships. Similarly, attaining any educational level is more likely than having no formal education at all for men to be engaged in multiple sexual partnerships, although the association is not significant with secondary education, it is, however, significant for all other level of education.

In addition, relative to being poor as referent category (RC), being average in wealth class (OR=1.38, $p<0.05$) and being rich (OR=1.30, $p<0.05$) are each 1.3 times more likely for men to engage in multiple sexual partnership. Being an Islamic faith adherent (OR=0.56, $P<0.05$) is 44.0% less likely for a man in Nigeria than being a Christian (RC) to be engaged in multiple sexual partnerships. Having positive attitude towards safer-sex negotiation (OR=0.78, $p<0.05$) is 22.0% less likely for men to engage in multiple sexual partnership than having negative attitude, which is the referent category (RC). Equally, ever tested for HIV (OR=1.76, $p<0.05$) is 1.8 times more likely than never been tested (RC) for Nigerian men to be engaged in multiple sexual partnerships. The results remain statistically unchanged when socio-demographic characteristics and the intervening variables were held constant in Models I and II. The binary logistic regression analysis of the effects of independent variables on multiple sexual partnership is presented in Table 6.

Table 6

Binary Logistic Regression Testing the Effect of the Selected Independent Variables on Men's Multiple Sexual Partnership in Nigeria

	MODEL 1	MODEL 2	MODEL 3
Multiple sexual partnerships			
No	RC	RC	RC
Yes	1.9(1.7-2.1)*	1.8(1.6-2.0)*	1.8(1.6-2.0)*
Age			
Adolescent		RC	RC
25-39 years		2.3(2.0-2.6)*	2.3(2.0-2.6)*
≥ 40 years		2.2(1.9-2.7)*	2.3(1.9-2.7)*
Marital status			
Never married		RC	RC
Married/living with spouse		2.3(2.0-2.7)*	2.4(2.1-2.7)*
Widowed/divorced/separated		2.0(1.5-2.7)*	2.0(1.5-2.8)*
Ethnicity			
Hausa/fulani/kanuri		RC	RC
Igbo		3.9(3.2-4.7)*	4.0(3.3-4.9)*
Yoruba		1.6(1.3-1.9)*	1.7(1.4-2.0)
Others		2.5(5.1-2.9)*	2.5(2.2-3.0)*
Types of residence			
Urban		RC	RC
Rural		1.0(0.9-1.1)	1.0(0.9-1.1)
Educational level			
No education		RC	RC
Primary		2.4(1.9-3.0)*	2.4(1.9-3.0)*
Secondary		4.1(3.3-5.2)	4.1(3.3-5.1)
Tertiary		13.9(11.1-17.4)*	13.7(10.89-17.1)*
Wealth status			
Poor		RC	RC
Average		1.2(1.0-1.4)*	1.2(1.1-0.9)*
Rich		1.7(1.5-2.0)*	1.8(1.5-2.1)*
Religion			
Christianity		RC	RC
Islam		0.8(0.7-0.9)*	0.8(0.7-0.9)*
African traditional religion/others		0.7(0.5-1.1)	0.7(0.5-1.1)
Sexual network			
No knowledge			RC
Has knowledge			1.1(0.9-1.3)
Negotiation for safer sex			
Negative			RC
Positive			1.3(1.2-1.4)*

Note. Data are given as odds ratio (95% Confidence Interval). Statistical significance (*P<0.05)*:*

Three models were developed to test the relationship at multivariate level of analysis using binary logistic regression. Model I test for the relationship between multiple sexual partnership and HIV test uptake. Model II controls for socio-demographic variables such as age, religion, residence, marital status, occupation, wealth status, educational level and ethnicity. Model III controls for intervening variables such as attitude towards safe sex and knowledge that multiple sexual partnerships can cause HIV infection. Models I and III illustrates odds of association of the selected independent variables to men's multiple sexual partnership after controlling for confounding variables and intervening variables. Odds ratio and *P-values* were observed with slight differences across the models after controlling for confounding and intervening variables. Analysis did not show any negative or positive confounding.

In model 1, there was a statistically significant relationship between multiple sexual partnerships and HIV uptake (OR:1.89, *P<0.05*). After controlling for socio-demographic variables in model II, there was a statistically significant difference between multiple sexual partnerships and HIV uptake (OR: 1.77, *P<0.05*) and when controlled for socio demographic variables and intervening variables, statistical significance remained unchanged (OR:1.79, *P<0.05*). Therefore, the significant relationship between multiple sexual partnership and HIV test uptake remains unchanged after controlling for socio demographic variables and intervening variables. Statistical analysis, therefore, showed

that men who engage in multiple sexual partnerships are 1.79 times more like to get tested for HIV compared to those who have one of less sexual partner ($P<0.05$).

In all, statistical analysis showed significant association between socio-demographic characteristics, HIV test uptake, and attitudes toward negotiating safer sex and multiple sexual partnerships among men (ages 15-49) in Nigeria, but no association between HIV knowledge and multiple sexual partnerships, therefore, two of the three null hypotheses were rejected in favor of the alternate hypotheses.

Hypothesis 1. In hypothesis I, outcomes of chi-square and binary logistic regression analysis showed that the socio-demographic characteristics (age, residence, marital status, religion, wealth status, ethnicity, and educational level) were significantly associated with multiple sexual partnerships among men (ages 15-49) in Nigeria.

Hypothesis 2. In hypothesis 2, outcomes of chi-square and binary logistic regression analysis showed that there is a significant statistical association between HIV text uptake and multiple sexual partnerships among men (ages 15-49) in Nigeria.

Hypothesis 3. In the third hypothesis, outcomes of chi-square and binary logistic regression analysis showed that there is an association between attitudes toward negotiating safer sex and multiple sexual partnerships among men (ages 15-49) in Nigeria, but there is no association between HIV knowledge and multiple sexual partnerships among men (ages 15-49) in Nigeria. At the multivariate level, employing the three model of the binary logistic regression, results indicated that the examined socio-demographic variables (age, residence, marital status, religion, wealth status, ethnicity, and educational level), HIV test uptake, HIV knowledge and attitudes toward negotiating

safer sex are statistically significant predictors of multiple sexual partnerships among men (ages 15-49) in Nigeria.

Summary

This quantitative study was conducted to determine the association between socio-demographic characteristics, HIV test uptake, HIV knowledge, and attitudes toward negotiating safer sex and multiple sexual partnerships among men (ages 15-49) in Nigeria. The study used variables from the 2013 NDHS. The statistical tests used for analysis support the rejection of two of the three null hypotheses tested for in this study. In addition, binary logistic regression analysis showed that socio-demographic variables (age, residence, marital status, religion, wealth status, ethnicity, and educational level), HIV test uptake, HIV knowledge and attitudes toward negotiating safer sex are significantly associated with multiple sexual partnerships. In addition, binary logistic regression analysis showed that multiple sexual partnerships and HIV test uptake are significantly associated after controlling for socio demographic variables and intervening variables. Section 4 will discuss the interpretation of my findings, study limitations, recommendations, theoretical implications, and talk to professional development and implications for social change.

Section 4: Application to Professional Practice and Implications for Social Change

This study addressed the low level of HIV test uptake among men with multiple sexual partnerships in Nigeria. The study also addressed the suitability of the HBM in understanding and foretelling HIV testing purpose, and the sociodemographic features that may be significantly associated with multiple sexual partnerships. Finally, I investigated the association between multiple sexual partnerships and knowledge of HIV and attitudes toward sex. The literature indicated evidence on factors influencing multiple sexual partnerships, use of HBM constructs in determining behaviors associated with HIV testing, and factors associated with low HIV test up take, but there was a gap in the literature on the relationship between HIV testing and multiple sexual partnership in Nigeria. In the previous studies, researchers examined factors associated with women's testing with little recognition of men's testing behaviors (Stephenson et al., 2013). Studies on determinants of testing focused on testing among couples and women seeking antenatal care (Cartoux et al., 1998; Jereni & Muula, 2008) with only a few focusing on men.

The study was conducted to describe HIV testing and multiple sexual partnerships among men in Nigeria using secondary data obtained through a cross-sectional survey. The independent variables for the first research question were age, residence, marital status, ethnicity, wealth status, and educational level, and the dependent variable was the number of multiple sexual partnerships. In the second research question, the dependent variable was the number of multiple sexual partnerships, and the independent variable was HIV testing. In the third research question, the independent variables were HIV

knowledge and attitude, and the dependent variable was the number of multiple sexual partnerships.

The study was conducted by using secondary data obtained from a sampling of sexually active Nigerian men ages 15-49 irrespective of current marital status. The population was randomly sampled through multistage sampling in the 2013 NDHS (National Population Commission & ICF, 2014). The sample was nationally representative and covered the entire Nigerian population residing in noninstitutional dwelling units in the country. The data set, which included 17,359 men sampled across the country, was extracted from the 2013 NDHS and analyzed for the study.

Interpretation of the Findings

I examined HIV testing and multiple sexual partnerships among men ages 15-49 years in Nigeria with a view toward understanding the association between sociodemographic characteristics and multiple sexual partnerships, determining the relationship between HIV test uptake and multiple sexual partnerships, and analyzing the association between HIV knowledge and attitudes toward negotiating safer sex and multiple sexual partnerships. The 2013 NDHS data set was used for this study. Descriptive and inferential statistical tools were used: the descriptive analyses showed that the men's ages ranged between 15 and 49 years, and the mean age was 29 years. Men ages 25-39 years made up the majority (5,069) of the sample. This indicated that the Nigerian population is young, which was consistent with the position of the World Population Pyramid that the Nigerian population age structure is progressive (Population Pyramids, 2018). This findings also showed that the rural population was still dominant

in the country with 50% of the men sampled living in rural areas. One out of three of the men was poor, and half of the men were married or living with a spouse. Hausa/Fulani were the major ethnic groups, and Islam was the most practiced religion. Most of the men had attained a basic level of education, but illiteracy was still an issue of concern as 1 in every 5 never had formal education.

Research Question 1

The first research question addressed the association between sociodemographic characteristics and multiple sexual partnerships among Nigerian men. The research question was answered by employing a chi-square test and binary logistic regression analysis at both bivariate and multivariate levels. The tests were performed at 5% level of significance. The results of the chi-square test and the binary logistic regression analysis showed that the selected sociodemographic characteristics of men were significantly associated with multiple sexual partnerships. The prevalence of multiple sexual partnerships was associated with age, education, wealth status, marital status, ethnicity, religion, and education.

Findings showed that age was a significant predictor of multiple sexual partnerships among men in Nigerian. Middle-age men (25-39 years) had higher odd for involvement in multiple sexual partnerships and were 4 times more likely to practice multiple sexual partnerships than young men ages 15-24 years. This finding was consistent with a study by Onoya et al. (2014) in South Africa, who documented that multiple sexual partnerships were more pronounced in men than women, and younger men reported more sexual partners compared to their older counterparts. This makes

having more than one sexual partner higher among younger adults. This was supported by the findings on marital status at the multivariate level that men who never married stood a greater chance of practicing multiple sexual partnerships than married men and those who had been widowed, divorced, or separated.

In addition, Nigerian men who are from the Hausa ethnic group are less likely to engage in multiple sexual partnerships than all other ethnic groups. This could be explained from the analysis of religion, which showed that men who were Islamic faith adherents were less likely to engage in multiple sexual partnerships. In support of the analysis on ethnic groups, Hausa men are predominantly Islamic faith adherents, which may explain their reduced likelihood of engaging in multiple sexual partnerships. According to the data analysis, education was a significant predictor of multiple sexual partnerships. Multiple sexual partnerships prevalence increased with men's level of education. This could be explained by the social context of high level of exposure associated with higher education. Men who are illiterate are less sexually exposed than those who have attained higher levels of education.

Educated men are aware that using condoms consistently and correctly can reduce the risk of HIV infection (National Population Commission & ICF, 2014). Therefore, educated men may engage in multiple sexual partnerships more often relying on their knowledge of HIV prevention. Also, there was a rural-urban difference in the prevalence of multiple sexual partnerships among Nigerian men as indicated by the chi-square analysis. More men in urban areas engaged in multiple sexual partnerships than their counterparts in rural areas. However, multivariate analysis showed that type of residence

was not a significant predictor of multiple sexual partnership. The possible reason for this is that infiltration of culture in the rural areas is more prominent in Nigeria through increase in the migration rate. The modern ways of life in the urban areas have now been replicated in the rural areas. These findings confirmed earlier studies that indicated that urbanization, modernization, religion, and culture influence multiple sexual partnerships (Dimbuene et al., 2014; Olaniran et al., 2013; Taiwo, 2000; Udigwe et al., 2014).

Research Question 2

In the second research question I examined the association between HIV test uptake and multiple sexual partnerships. This research question was answered by employing both chi-square test and binary logistic regression analysis. At the bivariate level, the results of the chi-square test indicated that there are differences in multiple sexual partnerships across the categories of HIV testing. The prevalence of multiple sexual partnerships among those who had ever been tested was almost double the prevalence among those who had never been tested for HIV. Also, the result of the binary logistic regression showed that HIV testing is a significant predictor of multiple sexual partnerships. Equally, those that have been tested are more likely to be engaged in multiple sexual partnerships than those never tested. This result contradicts the work of Arthur et al. (2007), Bentley et al. (1998), and Kabiru et al. (2010) where it has been documented that HIV test uptake has resulted in a decrease in multiple sexual partnerships. However, the result is compatible to Bassett et al. (2002) and Weinharot et al. (1999) report that knowledge of HIV status has no effect on reducing the number of sexual partners. The probable reasons for this may be explained in the context of

orientation change as a result of sustenance of negative status after having sexual affairs with more than one sexual partner over a long period of time. It is possible that men who have multiple sexual partners continue in their sexual recklessness after testing negative. They may tend to change their belief about the reality of HIV/AIDS after testing negative irrespective of their previous sexual recklessness, hence the urge to keep their multiple sexual partners.

Research Question 3

In the third research question I analyzed the association between HIV knowledge and attitudes toward negotiating safer sex and multiple sexual partnerships. The research question was answered by utilizing chi-square and binary logistic regression. The result of the chi-square test indicated that the categories of HIV knowledge regarding sexual network do not differ in the prevalence of multiple sexual partnerships. Hence, there is no statistically significant relationship between HIV knowledge regarding sexual network and multiple sexual partnerships, therefore, at the bivariate level, the variable was dropped from the binary logistic model.

On the other hand, the chi-square test indicated a significant association between attitude towards safer-sex negotiation and multiple sexual partnerships. The prevalence is higher among the men who are negatively disposed to the opinion that wife is justified to refuse husband sex if the husband has other sexual partners than those who showed positive attitude to this. In addition, the result of the binary logistic regression analysis affirmed that attitude towards safer-sex negotiation is a predictor of multiple sexual partnerships. This can be explained in the context of the patriarchal social setting of the

Nigerian society in which men dominate all family matters including sex. Men who dictate sexual matters and force their sexual decisions on women tend to have liberty in engaging in multiple sexual partnerships. The result is compatible to previous studies. Cohen (2014) and Bingenheimer (2010) reported that men dominance over women in sub-Saharan Africa and their control over economic resources are key promoters of multiple sexual partnerships.

Interpretation in the Context of the Health Belief Model

HBM applies to behaviors with the potential to reduce risks of developing disease as well as the effect of existing disease. as shown in the study. Men who were negatively disposed to the opinion that wife is justified to refused husband sex if husband has other partners, were practicing multiple sexual partnerships (29.7%) more than those who showed positive attitude (18.6%) indicating a perceive susceptibility to HIV. Aligning with the general assertion of the HBM is that people are likely to engage in health behavior if they are susceptible to a health condition. The model clearly states that health beliefs collectively affect behavior. Equally, an assumption of HBM is that demographic factors may affect beliefs and indirectly influence health behaviors (Glanz et al., 2015). Findings showed that education, age, ethnicity can alter susceptibility, severity, benefits and barriers, which are the core constructs of HBM. However, for a better understanding of health behavior there is the need to combine the constructs of HBM with constructs from other theories.

Limitations of the Study

In this study, my target participants are men ages 15-49 years. In Nigeria and other parts of Africa HIV affects every strata of the society. Having analyzed data from a fraction of the society (men ages 15-49 years), it may be difficult to generalized the result of the findings to Nigerian population. Also, the study used a secondary data collected in 2013, it is possible for the variables to have changed if the survey is to be conducted in 2018. This may have significant effect on the validity of the study. Secondary data at times are not absolutely accurate and this may have a serious effect on the external validity. The factors mitigating HIV infection and multiple sexual partnerships are multidimensional; hence a study on men ages 15-49 years would not have exhausted all factors. In addition, the study does not examine religious beliefs and cultural factors that are important in HIV test uptake. Encouraging further research on role of cultural factors and religious beliefs will help in understanding the study better. A key limitation of the study is that the measure of HBM was not well established in the variables used for analysis. The full ranges of factors that may influence behavior are not considered and this may affect validity.

Recommendations

This study established various socio-demographic characteristics of men that are strongly associated with multiple sexual partnerships. Development partners, government, and other policy makers should step up interventions that will enhance increase rate of HCT uptake among men ages 15 to 49 years. Future research should look at variables such as level of education, wealth status, knowledge of HIV that can be

controlled and examine their effects as determinants of multiple sexual partnerships among men. Therefore, this study recommends that it is important to control associated socio-demographic characteristics that can be manipulated to discourage the practice of multiple sexual partnerships among men. For instance, wealth status is found to be one of the significant predictor of multiple sexual partnerships among men in Nigeria.

In addition, the poverty level in the country is high. This implies that the rich men more than the poor have resources to exchange for sex in the society. To strive for economic survival, many poor women were prepared to engage in transactional sex with the rich men. Consequently, the rich are more involved in such practice than the poor. It is recommended that the poverty level in the country should be alleviated in favor of the women. This will enable women who may be earning income from sexual engagement with the rich men to have an alternative means of earning a decent living. Women empowerment is a public health approach that can result in improved women health outcomes. Men must support changes to behaviors to reduce the transmission of HIV and other sexually transmitted infections. Empowering women, will discourage the enlarged transactional sex market thereby making it difficult for men to have high number of sexual partners.

The patriarchal social setting in Nigeria has negatively affect women decision making as far as sexual and reproductive health are concerned (Lawoyin & Larsen, 2002;Taiwo, 2000). Women should be legitimately recognized as having the capacity to individually and collectively participate effectively in decision-making processes that will shape their lives and the society. If women's voices remain unheard in family

decision-making process such as in decision to consent on husband sex demand even when the women have knowledge that their husbands are having sexual affairs with other women outside the marital setting will encourage men to further engage in multiple sexual partnerships undeterred. This study recommends that social programs that can change the orientation of men in Nigeria is highly needed in order to encourage the involvement of women in the domestic decision-making process and the right to reject or consent to husband's sexual demand. Equally, culturally relevant and customized interventions that incorporate culture with modified evaluation instruments are needed. In addition, more HIV research and prevention efforts should be targeted at Nigerian men ages 15-49 years of age.

It is important to advance the negative effects of multiple sexual partners in HIV prevention program in the country. This is necessary to keep men with multiple sexual partners informed on the reality of HIV/AIDS even when they are tested negative after long period of sexual recklessness. The counseling component of the program should be strengthened to involve strong advocacy to engage men on the need for a positive change in sexual behaviors. There is the need to do a follow-up on those who tested negative to monitor and re-emphasize the reality of HIV/AIDS and its attendant effects on individual, family, and the society. This study, therefore, recommends accessible and well coordinated post-HIV test monitoring and evaluation for men.

Implications for Professional Practice and Social Change

Professional Development

The findings of the study may add to the body of knowledge by providing information that may be needed to determine specific area where progress can be made by public health professionals to advance innovative programs to assist in halting new HIV infections in Nigeria. Intervention such as an accessible and well coordinated post-HIV test monitoring of men will help reduce the rate of new infections. Equally, the findings of the study may give a clue to men sexual health behavior in Nigeria that may be of importance to health planners and public health experts in identifying men's health needs that may assist in providing remedy for the social and cultural impediments that could have resulted in low HIV uptake and high multiple sexual partners among men in Nigeria. Also, it may provide a clue to the association between socio-demographic elements and the incidence of new HIV infection in Nigeria. In planning health interventions or programs aimed at HIV reduction through behavioral change in Nigeria, the findings of this study may be useful to researchers and health planners which may result in positive social change among Nigerians since behavioral change is a key element in addressing HIV and its socio-economic effects. Another significant implication of the study is the need to appreciate the impact of ethnicity on individual beliefs system in HIV transmission. Efforts should be made to modify existing models to meet individual cultural needs.

Individual

Those who are living with HIV/AIDS are constituent of the society. The findings of this study may result in reduction of discrimination against HIV positive patients in employment opportunities especially if such individuals are used as counselors and as hero in HIV interventions/programs. The findings of this study may improve the life of individuals living with HIV/AIDS and those taking care of them in Nigeria. Equally, behavioral change among men may change Nigerian perspective for HIV testing. Once men get the issue of HIV right, their children, spouses, and the entire family will be educated on HIV preventive measures since our culture recognize men as the head of the family. This study may be a wakeup call for men to discourage the habit of having many sexual partners especially when tested negative.

Policy

This study may result in positive social change by presenting public health experts, health care managers, and donor agencies with valuable information on how multiple sexual partners, HIV test uptake, HIV knowledge, and attitudes toward sex influence sexual risk behaviors among men in Nigeria. The study may result in formulation of an efficient and affordable HIV testing policy. Policy that may be a positive step towards effective HIV prevention and control practices in Nigeria. It is important that future HIV/AIDS education is tailored to specific culture in Nigerian. A well tailored and implemented HIV policy on HIV testing will reduce the rate of new infections, HIV related deaths, cost of HIV treatment, and improve human life in Nigeria.

Society

At the society level, the findings of the study may encourage health infrastructural development such as provision of more HCT centers across the country that may lead to increase HIV test uptake. New coalitions and alliances may emerge among community organizations to address HIV/AIDS issues. The local hotels and commercial sex houses may adopt HIV testing policy and besides openly debate HIV/AIDS issues in public meetings. Appreciating that this study was carried out among sexually active men has insightful implications for HIV prevention since sexual networks in Nigeria have usually been controlled by male sexual behaviors. Therefore, positive change in men sexual behavior could considerably reduce sexual networks in an astonishing way. Although this study does not provide detailed analysis on sexual networks, its findings may pay attention to the rapid changes in men sexual behaviors and emphasize the need for more AIDS awareness and prevention in various communities (Yingying, Smith, & Suiming, 2011).

Conclusion

Culturally relevant interventions, as well as research that incorporate culturally meaningful concepts are essential to promote positive sexual behaviors among men in Nigeria (Yingying et al., 2011). In addition, more HIV research and prevention efforts shouldbe targeted at Nigerian men ages 15-49 years of age. Scaling-up HIV testing efforts among men is a priority for effective HIV prevention since men 15-49 years of age are sexually active individuals likely to pose a considerable threat in transmitting HIV to other groups in Nigeria. Health promotion programs targeted at removing

obstacles to HIV testing and multiple sexual partnerships should be expanded among men in Nigeria.

The HBM suggests that individuals are less likely to move to action if the barriers to disease overshadow the benefits (Glanz et al., 2015). The study may give a clearer picture of the state of HIV test uptake and practice of multiple sexual partnerships among men in Nigeria. It may present HIV testing as a preventive tool to reduce the rate of new HIV infections in Nigeria. Further research on prevention efforts that include culturally meaningful concepts should be conducted. Equally, further research to examine the role of religious belief on HIV transmission and its impact on multiple sexual partnerships among men aged 15-49 years in Nigeria should be conducted. Stakeholders should emphasize the merits of HIV testing and reduce the barriers connected with HIV test uptake. Programs and intervention must be customized towards increasing the rate of HIV test uptake, increase HCT centers, and makes HCT affordable and accessible to men.

Finally, analysis revealed that multiple sexual partnerships is pronounced among middle-aged men in Nigeria and low among Hausa Muslims. Uptake of HIV test promotes occurrence of multiple sexual partners. In addition, educated men residing in urban areas are more exposed to multiple sexual partnerships than their illiterate counterparts.

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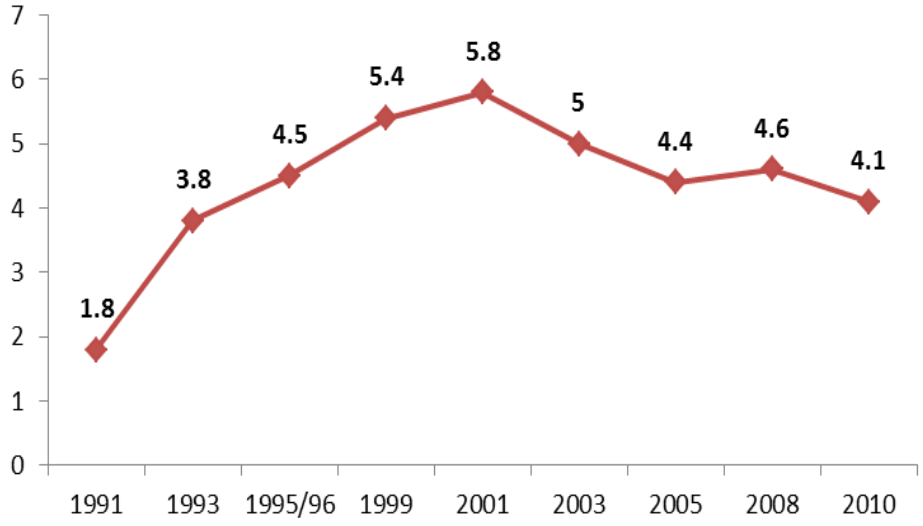
Appendix A: National Median HIV Prevalence Trend in Antenatal Clinic in 1991-2010



Appendix B: HIV Prevalence in Nigeria