FACTORS AFFECTING UPTAKE OF HIV COUNSELLING AND TESTING AMONG ADULTS IN BUNKURE LGA KANO STATE

BY

ALIYU IBRAHIM SHEHU
P13 MDCM 8013

A DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES AHMADU BELLO UNIVERSITY ZARIA, NIGERIA IN PARTIAL FULFILLMENT FOR THE AWARD OF THE DEGREE MASTER OF PUBLIC HEALTH IN FIELD EPIDEMIOLOGY

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ATTESTATION

I declare that the work in this dissertation "FACTORS AFFECTING UPTAKE OF HIV COUNSELLING AND TESTING AMONG ADULTS IN BUNKURE LGA KANO STATE, NIGERIA" was performed by me in the Department of Community Medicine under the supervision of Dr. A.A. Abubakar and Dr. A.A. Gobir. The information derived from literature has been duly acknowledged in the text and a list of references provided. No part of this dissertation was previously presented for another degree or diploma at any University.

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Aliyu Ibrahim Shehu Date

CERTIFICATION

This Dissertation entitled " FACTORS AFFECTING UPTAKE OF HIV COUNSELLING AND TESTING AMONG ADULTS IN BUNKURE LGA KANO STATE, NIGERIA" by Aliyu Ibrahim Shehu meets the regulations governing the award of Master degree in Public Health of Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literacy presentation.

……. Date……
Dr. A. A. Abubakar (MBBS, MPH Field Epidemiology, FWACP)
Department of Community Medicine
Ahmadu Bello University Zaria

……. Date……
Dr. A. A. Gobir (MBBS, FWACP)
Department of Medicine
Ahmadu Bello University, Zaria

……. Date……
Dr. A. A. Abubakar (MBBS, MPH Field Epidemiology, FWACP)
H.O.D. Community Medicine
Faculty of Medicine
Ahmadu Bello University, Zaria

……. Date……
Professor Kabir Bala (MBA, Ph.D, FNIOB, MAPM, MCABE, M.Sc)
Dean School of Postgraduate Studies
Ahmadu Bello University, Zaria

DEDICATION

This research work is dedicated to my father Sheikh Aliyu Ahmad Gwarando

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LIST OF ACRONYMS

FGD	-	Focus Group Discussion
FSW	-	Female Sex Workers now called Women that sell sex (WSS)
HIV/AIDS	-	Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome
IDUs	-	Intravenous Drug Users
IEC	-	Information Education and Communication
IBBSS	-	Integrated Biological and Behavioral Sentinel Survey
MARPs	-	Most-at-Risk-Populations
NACA	-	National Action Committee for AIDS Control, SACA at state, LACA at LGA levels
NARHS	-	National HIV/AIDS and Reproductive Health Survey
NDHS	-	National Demographic and Housing Survey
NPP	-	National prevention plan for HIV/AIDS
PEPFAR	-	President's Emergency Plan For AIDS Relief
PMTCT	-	Prevention of Maternal To Child Transmission
UNAIDS	-	Joint United Nations Program on HIV/AIDS
VCM	-	Volunteer Community Mobilizer
WOFAN	-	Women Farmers Advancement Network

SUMMARY

HIV Counseling and Testing play a vital role in HIV prevention and control as an entry point of care and support. Globally > 6,800 people became infected and > 5,700 die from AIDS daily, mostly because they have no access to HIV services. In sub-Saharan Africa, most infection occurs due to heterosexual intercourse leading to mother –to- child transmission. In Nigeria, heterosexual sex remains the primary mode of transmission; 80-95%, yet uptake of HIV Testing services was low in Bunkure; 1.2 % in 2015, only 2 centers for PMTCT , one offers HCT, ART and PMTCT. In 2013, Bunkure was ranked 44 out of 44 LGAs in terms of PMTCT, due to 100% absent of HIV services with prevalence of 3.4% and 354 HIV positive pregnant women. The study aimed at determining individual, community and health facility factors affecting HCT uptake in Bunkure.

A cross sectional descriptive study was used to select 350 adults using multistage sampling technique. Data was collected using a pre-tested interviewer administered questionnaire and analyzed using Epi-info.

Univariate analysis showed age range of 16-62years, mean of 34.5yrs ±10.9, 51.4% were female, about 60% had no formal education, >70% were Hausa farmers and traders, 75% were aware of HCT site in Bunkure, 60% had information through health worker and 79% were willing to do the test although uptake of HCT was 19% due to cultural belief (73%), stigmatization (86%), fear of test (70.5%), location of facility (90.1%), distance (83.1%) and confidentiality (65.2%). Bivariate analysis showed association between uptake of HCT and gender in favor of female (OR 0.3 CI 0.19-0.6 $p<0.05$), education (OR 2.0, CI 1.2-3.4 $p=0.01$), Awareness of HCT site (OR 0.9 CI 2.8-30.7 $p<0.05$), and Willingness to do the test (OR 22.8 CI 3.1-167.6 $p<0.05$), stigmatization (OR 0.2, CI 0.1-0.3 $p<0.05$) and fear of test (OR 0.3, CI 0.2-0.5, $p<0.05$). On

logistic regression, tertiary education/ none (p= 0.02), gender male/female (0.00) knowledge of site of HCT (p=0.0002) and stigmatization (p=0.00) were statistically significant.

Less than a quarter of adults in Bunkure obtained HIV testing services, being female, having attained tertiary level of education and being aware of HCT site enhanced uptake, and although willingness to do the test was high, stigmatization hindered uptake while health facility factors were not likely. The community, Government and supporting agencies should collaborate in creating awareness and funding research to improve HIV uptake from 19% to 40% by the end of 2018 and PEPFAR target of 90-90-90 model for interruption of HIV transmission by the year 2020.

Key words: Factors, uptake, HIV counselling and testing, adults

CHAPTER ONE

INTRODUCTION

1.1 Background Information

HIV Counseling and Testing (HCT) play a vital role in HIV prevention and control. For people with HIV infection, HCT acts as an entry point of care and support as it also provides people with an opportunity to learn about and accept their HIV sero-status early, in a confidential manner backed by counseling and referral for ongoing emotional support and medical care. This measure has been shown to be a successful approach in many countries. Counseling helps HIV discordant couples accept safer sex practices to prevent HIV transmission to the un-infected partner, as such couple counseling on HIV can, thus, be provided as part of premarital counseling. [1] It is disheartening that globally, more than 6,800 people become infected with HIV and more than 5,700 die from AIDS every day, mostly because they have no access to HIV prevention, treatment and care services intervention. [2] In sub-Saharan Africa, most HIV infection occurs due to heterosexual intercourse between couples in a relationship and mother –to- child transmission. [3] In Nigeria, heterosexual sex remains the primary mode of transmission for HIV and accounts for 80-95% of HIV infections in the country.[4]

As there is no effective vaccine and cure for HIV infection, HCT has been used as entrance for change of behavior and accessibility to continue treatment with antiretroviral drugs and subsequently prevention of mother –to- child transmission through use of antiretroviral drugs and modification of infant feeding practices without which mother –to- child transmission occurs in 21-32% of HIV positive pregnancies, therefore there is increased attention on HCT services which provides a high privilege for HIV prevention intervention for African countries, by contributing to the prevention of HIV infection through diminishing heterosexual transmission

between partners and indirectly protects any potential child from contacting the virus.[5] A range of studies conducted in different settings indicate that individual factors such as gender, education, occupation and risk perception are the main determinant factors for seeking HCT uptake, but the results were inconsistent across studies. However further research need to be done to assess the level of HCT uptake and factors affecting uptake, by looking at the individual, community and health facility barriers, so as to institute appropriate HCT services that will help in preventing the spread of HIV in the communities.[6]

1.2 Statement of Problem

Uptake of HIV Counseling and Testing in Bunkure Local Government Area of Kano state was low; facility data showed the Proportion of HCT uptake to be 1.2%. This may be due to multiple factors affecting uptake. In 2015, Bunkure with population of over 170,891, uptake of HCT was 475 in addition to 1626 PMTCT. There were only 2 centers for PMTCT, but only one of the two facilities offered HCT and ART in addition to the PMTCT.[7– 8] In 2013, Bunkure was ranked 44 out of 44 LGAs in terms of preventing maternal –to- child transmission of HIV, due to 100% absent of HIV services in the LGA despite having prevalence of HIV to be 3.4% with 354 HIV positive pregnant women,[9] this was a high burden on the health services and the community, considering the magnitude of HIV infection in the country and worldwide. UNAIDS revealed that, there were approximately 36.7 million people living with HIV/AIDS globally, at the end of 2015. Out of these, 1.8 million were children (<15 years old). An estimated 2.1 million individuals worldwide became newly infected with HIV in 2015.[10] A striking gains have been made towards many of the 2015 targets and elimination commitments, although significant challenges remain [11] that need further research. HIV-related stigma and discrimination persist as major obstacles to an effective HIV response in all parts of the world; national surveys showed

that discriminatory treatment of people living with HIV remained common in multiple facets of life, including access to health care.[11]

According to UNAIDS 2003, every day, about 6000 young people aged 15–24years become HIV-infected which account for half of all new HIV infections.[12] This may have impact on Agriculture and all other sectors of economy. According to the report of Kano state wide rapid health facility assessment 2013, in preparation for elimination of mother –to- child transmission of HIV by the year 2015, the prevalence of HIV in Kano state was estimated to be 3.4% and several impacts of HIV/AIDS have been documented; the number of orphans, widows and widowers has increased because of HIV/AIDS, there is reduced productivity as a result of time spent while in hospital and looking after the orphans and caring for those who are suffering from the disease which can only be prevented if people know their HIV status and take appropriate action early.[9] With all these, factors responsible for this low uptake of HCT in Bunkure are not clear despite some efforts been done to mitigate HIV/AIDs in the LGA. In 2003, WOFAN had conducted HIV awareness campaign through literacy and vocational training to address HIV issues in Bunkure among other selected LGAs in the state, in collaboration with community and religious leaders aimed at reducing HIV transmission in their communities.[13] There is scarcity of data to monitor the progress. Whereas several studies have been carried out on HCT uptake, most were focused on assessing individual factors; on knowledge, attitude and practice in different parts of Nigeria [14-16] and none was conducted in Bunkure. Even the previous studies conducted, most were carried out among a homogenous group such as youths, teachers, drivers and other high risk groups and most of the studies were institutional not community based, as such this study was conducted among adults in the community to explore the individual factors, community as well as Health facility barriers to uptake of HIV Counseling and Testing in

Bunkure communities were the factors responsible are not clear, hence there is need to approach the problem holistically. Public health implication of this study is that it will bring out the picture of the level of HIV services and why such poor uptake and sensitize the community, the policy makers and all other stakeholders whose common goal is to control HIV epidemic.

1.3 Justification of the Study

Bunkure is in sub-Saharan Africa where the mode of transmission is heterosexual intercourse and this region contains almost two-third of young people living with HIV. [17]

The study will help in creating community awareness on HIV infection as well as the preventive measure; HIV Counselling and Testing, as many approaches to HIV prevention and care require people to know their HIV status as early as possible. The first line of prevention of mother to child transmission (PMTCT) is preventing HIV infection among prospective parents through HCT which will subsequently protect the new born children and prevent the future adults from acquiring the disease from their parents. HCT has been identified as an effective measure for the prevention and control of HIV in certain African countries targeted for reducing the rate of maternal –to- child transmission of HIV by 90% from 2011-2015. [12]

Nigeria is one of the African countries putting effort to stop Maternal –to- child transmission of HIV according to 2011 United Nation Political Declaration Target 3; elimination of new HIV infections among children by 2015 and substantially reduce AIDS-related maternal deaths by last year 2015, which was not achieved, due to multiple factors that need to be investigated to help the country plan how to achieve such target not very far from last year 2015.[9]

Most studies done on HCT uptake were on Knowledge Attitude and Practice, institutional and among homogeneous group, Therefore there is need to do field study on the likely multiple

factors affecting uptake of HCT among heterogeneous group. This will serve as baseline information to sensitize and redirect the policymakers and international partners to deploy resources on areas where interventions may be most successful for proper planning, implementation and evaluating the effectiveness of the strategies for the prevention of HIV infection among rural underserved communities like Bunkure in north-western Nigeria. [16] The recommendations will help identify areas where interventions may be most successful in increasing the uptake and impact of HCT in Bunkure, so as to reduce the burden of HIV.

1.4 Study questions

1) What individual factors influence uptake of HCT among adults in Bunkure?
2) What is the community's attitude towards uptake of HCT in Bunkure?
3) What are the health facility related barriers to uptake of HCT in Bunkure?

1.5 General and specific objectives

1.5.1 General Objective

To determine factors affecting uptake of HIV counseling and testing among adults in Bunkure Local Government Area of Kano state.

1.5.2 Specific Objectives

i. To determine the individual factors influencing uptake of HCT.
ii. To assess the community factors affecting uptake of HCT.
iii. To identify perceived health facility barriers that affect uptake of HCT.

1.6 Hypothesis

1.6.1 Null hypothesis

i. There is no association between the individual factors and uptake of HCT in Bunkure.

ii. There is no association between the community attitudes and uptake of HCT in Bunkure.

iii. There is no association between the perceived health facility barriers and uptake of HCT.

1.6.2 Alternative hypothesis

i. There is association between the individual factors and uptake of HCT in Bunkure.

ii. There is association between the community attitudes and HCT uptake in Bunkure.

iii. There is association between the perceived health facility barriers and HCT uptake.

CHAPTER TWO

LITERATURE REVIEW

2.1 History of HIV/AIDS

The origin of HIV is unknown, although some Authors postulated an African origin.[18,19] There is still no conclusive evidence that HIV originated in Africa. Findings in favor of an African include the 1986 report that described the earliest serologic evidence of HIV-1 virus in Africa.[20] Other study also revealed that retrovirus HIV-2 was isolated in Africa.[21] Another study conducted in 1983, reported apparent cases of AIDS identified retrospectively in Europe from the 1960s and 1970s and one case as long as 1958.[22] These cases were reported to be in persons probably infected in Africa. In the first decades of AIDS pandemic, cases were reportedly largely from North America, Africa, Europe, Australia and parts of Latin America,[22] In 1981, the first clinical report of AIDS were reported as cases of rare lung infection called Pneumocystic carinii pneumonia found in five young men in Los Angeles,[23] and at the same time a rare neoplasm called Kaposi's sarcoma were reported in a group of men in New York and Califonia from east and west coast of United States of America, affecting mainly homosexual men.[24] Since then, the disease has spread dramatically all over the world. In 1982 AIDS cases were reported from a number of European countries,[25,26,27] in same year Uganda reported cases of unknown fatal wasting disease,[28] while in 1983, France reported discovery of new retrovirus that could be the cause of AIDS.[29] The first reports of AIDS in children hinted that it could be passed via casual contact but this was later ruled out and it was concluded that they had probably directly acquired AIDS from their mothers before, during or shortly after birth which[30] could have been prevented through HCT and ART. In same year, CDC identified all major routes of transmission and ruled out transmission by casual contact, food, water, air or surfaces.[31] The association between

infection with human immunodeficiency virus (HIV) and the development of AIDS was established in 1984, [32] while the first commercial HIV Testing to detect HIV virus by ELISA was commenced in USA in 1985.[33] The virus that causes AIDS was officially called HIV in 1986 instead of HTLV-III/LAV.[34] In 2003, President's Emergency Plan For AIDS Relief (PEPFER) was established with HCT as one of the major strategies for prevention and control of HIV infection,[35] and in 2015, the ambitious 90-90-90 targets which aim for 90% of people living with HIV to be diagnosed using HCT, 90% to be accessing antiretroviral treatment and 90% to achieve viral suppression by 2020 was launched.[36]

Virology and behavioral pattern of HIV virus

The human immunodeficiency viruses 1 and 2 (HIV-1, HIV-2) originated from the simian immunodeficiency viruses (SIVs) of primates. Thus, HIV-1 and HIV-2 each had a zoonotic origin but now spread directly from human to human. HIV-1 was first isolated in 1983 and HIV-2 in 1986 and they represent two different epidemics. The SIV of chimpanzees (SIV) gave rise to HIV-1 in humans, and the SIV of the sooty mangabey monkey (SIV) to HIV-2 in humans. [37] It is still uncertain exactly how the transmission of these SIVs to humans occurred, but it may have been during the hunting and preparation of these primates for food, by the indigenous people of these areas in Central and Western Africa, where these primate species live. [38] Studies using molecular clock evolutionary assumptions have suggested that the ancestor virus for HIV-1 appeared in around 1931 [39] and that of HIV-2 in around 1940. [40] After this initial transmission event, it is likely individuals infected with these primate SIVs then transmitted the human form of the viruses (HIV-1, HIV-2) to other people in their communities, from where it spread, world-wide. HIV, the etiologic agent for HIV infection and AIDS, is a RNA virus within the family of Retroviridae, in the genus of Lentiviruses. Retroviruses have been recognized to be associated

with some malignancies, autoimmune diseases, immunodeficiency syndrome, aplastic hemolytic anaemias, bone and joint diseases and diseases of nervous system.[37] The lentiviruses are celiopathic and destruction of particular target cell being the usual pathology. Viral infection of cells begins with the attachment to a surface receptor, which in HIV infection, it is the CD4-surface molecule. Because CD4-positive T cells and monocytes express high levels of this receptor, they are the primary targets of HIV. After the virus enters the infected cell, the reverse transcriptase makes a DNA copy of the HIV RNA, which is incorporated into the host DNA genome. This pro-viral DNA remains latent until a cellular activation event initiates pro-viral DNA transcription and sequential protein formation. The appropriate complement of viral genomic RNA, processed protein and enzymes are then assembled at the cell surface and subsequently bud from the cell as matured viral particles resulting in clinical manifestations by causing a progressive dysfunction and depletion of infected CD4 cells.[41]

HIV prevention interventions

The HIV prevention field focused on HCT and other interventions that have evolved rapidly over the years. Now numerous interventions to prevent HIV acquisition are available; however, these have not been implemented and utilized in relation to the magnitude of HIV burden in underserved communities. These interventions include comprehensive and effective public health strategies such as programming for behavior change, HIV testing and knowledge of HIV status, harm reduction efforts for injecting substance use, condom use, medical male circumcision and provision of post exposure prophylaxis. Whilst the combination of these HIV prevention packages has the potential to prevent more than 90% of HIV transmission during vaginal and anal sexual intercourse, their use is heavily influenced by multiple factors; individual, community as well as health facility barrier factors that need to be studied.[42,43]

Several factors may have contributed to the rapid spread of HIV-1 infection in Sub-Saharan Africa as such "Knowing your epidemic" has been the basis and opportunity for countries to critically assess and match the prevention response intervention to meet the priority needs [44, 45] Whilst these have been useful as a national response and scaled up towards attaining universal access to prevention and treatment including care and support for all, these have failed to address social and economic factors driving the epidemic especially stigma and discrimination, inadequate sexual health education, and inadequate voluntary HIV testing and counseling services as Testing for HIV infection is useful for public health and infection control purposes, for epidemiological monitoring, and for identifying HIV-infected persons who may benefit from early medical intervention. These relationships, together with physiological differences, determine to a great extent an individual's risk of infection and their ability to protect themselves. However, country level HIV data masks diverse, complex and heterogeneous epidemics at sub-national, regional and district level. Furthermore, as new HIV infections continue one or more sub-populations of virus emerge[46,47] resulting in the spread of HIV viral variants. The complexity and heterogeneity of local epidemics evolve with localized differences, highlighting the importance of "locations" and "populations" [48-51] Firstly, the urbanization of Africa with subsequent disruption of the traditional family unit led to an increase in prostitution, a known mode of transmission of HIV in Africa as the overall country level HIV prevalence may mask the true complex nature of the epidemic in relation to key multiple risk factors and populations density as evidenced by district level prevalence and geospatial mapping of HIV; Nigeria like other sub-Saharan African countries, experience significant variability with "hotspots" clustered around truck stops, main transport routes, sex work and further complicated by migration and limited access to health care in certain areas, political changes, and war were

also important in the development of the current HIV epidemic in Africa.[48,50-54] Geospatial mapping is a novel approach that is being used to map HIV infections[50,54] in order to understand geographic variation of the HIV epidemic, its drivers, and for increasing the efficiency of targeted interventions in high HIV burden, resource poor settings. A combination of HIV phylogenetic analyses with the relevant socio demographic and behavioral data provide powerful knowledge on patterns and dynamics of HIV transmission networks across communities, which could guide HIV prevention and intervention strategies.[55-57]

HCT in rural areas need to be given due attention, as for example in the rural area of Botswana, a high proportion of Mochudi clusters were identified among sequences suggesting that the HIV epidemic in that community was dominated by locally circulating viral variants,[55] in Uganda, using locations of self-reported sexual partners, approximately 39% of new viral transmissions occurred within stable household partnerships, and that among those infected by extra household sexual partners, 62% were infected by sexual partners from outside their community.[49] These data provide empirical evidence to understand the dynamic heterogeneity of HIV which to a significant degree is often masked at a country level[48] due to limited research. The HCT which is universal has limitations. Usually antibodies appear within 3-6 months after HIV infection and because an infected person does not develop antibodies immediately, a negative result cannot rule out recent HIV infection. If recent exposure is suspected, HCT must be repeated in 6 months. On the other hand, antibody tests occasionally may be falsely positive even when carried out and interpreted properly.[58] False positive tests are rare, however; and can usually be identified by additional testing.

2.2 Epidemiology of HIV/AIDS Globally and in Nigeria

HIV continues to be a major global public health issue, In 2015, an estimated 36.7(34.0-39.8) million people were living with HIV with 2.1 (1.8-2.4) million people becoming newly infected, claimed more than 35 million lives so far with 1.1 (940 000–1.3 million) million people died in 2015 from HIV-related illnesses globally, the vast majority of this number live in low- and middle- income countries with sub-Saharan Africa been the most affected region, with 25.6 (23.1–28.5) million people living with HIV in 2015 and sub-Saharan Africa accounts for two-thirds of the global total of new HIV infections, with all these it was estimated that only 54% of people with HIV know their status.[59] In 2014, approximately 150 million children and adults in 129 low- and middle-income countries received HIV testing services. The vast majority of them (an estimated 19 million) live in east and southern Africa which saw 46% of new HIV infections globally in 2015,[59] around 40% of all people living with HIV do not know that they have the virus. [60] In 2015, from the roughly 2.1 million worldwide new HIV infections, 150,000 were among children, most of them live in sub-Saharan Africa and were infected via their HIV-positive mothers during pregnancy, childbirth or breastfeeding. [61] Progress in decreasing new HIV infections among adults has slowed in recent years. Since 2010, the annual number of new infections among adults (15+) has remained static at 1.9 million.[59] A comparison of country data shows huge discrepancies in efforts to slow the spread of new infections. Some countries have achieved a decline of 50% or more in new HIV infections among adults over the last 10 years, while many have made no measurable progress. Yet others are experiencing worrying increases in new HIV infections.[59]

Sub-Saharan Africa has the most serious HIV and AIDS epidemic in the world. In 2013, an estimated 24.7 million people were living with HIV, accounting for 71% of the global total [62]

with an estimated 1.5 million new HIV infections and 1.1 million AIDS-related deaths.[62] The HIV prevalence for the region is 4.7%, but varies greatly between regions within sub-Saharan Africa as well as individual countries. For example, Southern Africa is the worst affected region and is widely regarded as the 'epicenter' of the global HIV epidemic. Swaziland has the highest HIV prevalence of any country worldwide (27.4%) while South Africa has the largest epidemic of any country with 5.9 million people living with HIV. By comparison, HIV prevalence in West and East Africa is low to moderate ranging from 0.5% in Senegal to 6% in Kenya.[62]

Various studies have shown that certain states in Nigeria have higher HIV prevalence than the national average of 3.4% thus, considered to have high HIV burden,[63,64] the first official report of HIV/AIDS in Nigeria was in 1986.[63] In 1991, the Federal Ministry of Health (FMOH) conducted the first HIV sentinel surveillance, which estimated the national HIV prevalence to be 1.8%. Additional surveys in 1996, 1999, and 2001 showed national a prevalence of 4.5%, 5.4%, and 5.8% respectively.[63] In 2003, Nigeria saw its first decline in HIV.[63] In 2015, HIV and AIDS estimates in Nigeria showed number of people living with HIV to be approximately 3 500 000 (2 600 000 - 4 500 000); adults aged 15 to 49 prevalence rate 3.1% [2.1% - 3.6%], adults aged 15 and over living with HIV 3 200 000 (2 400 000 - 4 200 000], women aged 15 and over living with HIV 1 900 000 (1 400 000 - 2 400 000), children aged 0 to 14 living with HIV 260 000 (190 000 - 360 000), deaths due to AIDS ,180 000 (120 000 - 250 000), orphans due to AIDS aged 0 to 17 were1 800 000 (1 300 000 - 2 600 000).[65]

According to NACA report of 2013, Nigeria had the third highest burden of HIV and AIDS in the world. The general population survey in 2013 puts the country at an HIV prevalence of 3.4%, lower than 3.6% reported in 2012. About 3.5 million people were estimated to be living with

HIV/AIDS in Nigeria and the estimated number of new infections and HIV/AIDS related deaths was 390,000 and 217,000 respectively in 2013.[66] There was a slightly higher HIV prevalence in the rural areas (3.6%) than in the urban areas (3.2%). The distribution of the epidemic also varies with geographical regions; the HIV prevalence was highest in the South-South zone (5.5%) and lowest in the South East (1.8%). HIV prevalence was generally higher among respondents with primary and secondary education (4.0%) and lowest among respondents that had Qur'anic education only (2.4%), and also higher among the wealthier (3.7%) than the poor (2.9%).[66] NARHS 2012 report showed that River state had the highest prevalence of HIV 15.2%, followed by Taraba 10.5% and Kaduna 9.2% while Ekiti state had the lowest prevalence of 0.2% followed by Zamfara 0.4% and Bauchi 0.6%.[67] Therefore every individual is entitled to do HCT irrespective of his social background as HIV has different ways of transmission not only through sexual contact. The modes of spread include sexual (man-man, heterosexual and oral), parental (blood or blood products recipients, injection drug users and those experiencing occupational injury) and vertical. After exposure the transmission risk is over 90% for blood or blood products, 15-40% for the vertical route, 0.5-1.0% for injection drug use, 0.2-0.5% for genital mucous membrane spread, as such uptake of HIV services had become necessary to avoid accidental contact.[68] Delay in uptake of HCT causes delay not only on adult ART but also affect paediatrics treatment as such paediatrics antiretroviral treatment (ART) coverage remains low, at 12% among children 14 years or younger, despite the fact that children experience a 76 reduction in mortality if ART is introduce before age 12 weeks.[69]

2.3 Basic Concept of HIV Testing and Counselling

The concept; HIV voluntary counseling and testing (VCT) presently known as HIV counseling and testing (HCT) was developed in the mid-1980s as the standard of care for individuals

seeking to know their status. These services are cost-effective interventions that provide opportunities to increase awareness and HIV and prevention practices, and are essential components of HIV prevention programs. It has also emerged as a central prevention strategy in National AIDS control plans in most developing world. HIV testing and counseling is important for both primary and secondary HIV prevention because, the latest communication campaign under the Centers for Disease Control and Prevention's (CDC) Act Against AIDS initiative. Launched today at the 2015 National HIV Prevention Conference, this new national bilingual HIV and AIDS testing campaign, Doing It, emphasizes the importance of HIV testing for all people aged 18–64. HIV testing is the first vital step that links persons living with HIV to medical care and treatment that can help them live longer, healthier lives and reduce the chance of transmitting HIV to their partners. It can help prevent people from becoming infected with HIV, or help people living with HIV avoid transmitting the virus, by discouraging high-risk behavior and reinforcing protective behavior.[70] The knowledge and sero-status may equally lead individuals to avoid engaging in risky behavior and increases abstinence.[71] HIV testing is the gateway to HIV treatment and care and it is critical in the scale-up of universal access to HIV prevention including in the context of male circumcision. HIV counseling pre and post has been an integral part of HIV testing. The term initially was voluntary counseling and testing (VCT) later called HIV counseling and testing (HCT) which has three modalities; client-initiated testing and counseling (CITC) involves individuals actively seeking HIV testing and counseling at a facility that offers such services. The other two modalities being provider initiated testing and counseling (PITC) and HIV self-testing (HIVST). CITC can be done in community or special purpose settings. According to UNAIDS 2015, the new term for HCT is now HIV testing services (HTS) which embrace the full range of services that should be provided together with

HIV testing. The test should be undertaken within the framework of 5Cs; consent, confidentiality, counseling, correct test results and connection/linkage to prevention, care and treatment. [72]

The overall HIV testing and counselling goal for a national HIV programme is to identify as many people living with HIV as early as possible and link them to prevention, care and treatment services in an appropriate and timely manner, yet majority of Nigerians were not aware of their HIV status. Report showed that percentage of respondents that have ever tested for HIV was low (26.3%) with variations between regions, target populations, sex and age groups with South Eastern Nigeria having the highest percentage of 40% (35% male, 44% female) and least in the North West having the least percentage of 13% (12% in male, 14% female) while adolescent and young people (AYP) aged 15-19 years old that had ever tested for HIV was 12.7% (12.4% male and 13% female). Only about 36% of those that have ever tested took the HIV test less than 12 months prior to the survey, amongst MARPs, HCT uptake in the last 12 months was highest amongst brothel based FSW (54.3%) and least amongst IDUs (27.7%). Willingness to test was high (78%) among those that ever tested; 30% voluntarily requested for a test, 37% were offered an HIV test and they accepted to be tested, 24% took the test because they were mandated to do so and only 62% of males and 61% of females knew where to get an HIV test.[73] The number of health facilities that provide HIV counseling and testing services as of 2012, was 2,624. This is low in relation to over 22,000 health facilities across the nation. A higher proportion of current HCT services are located in secondary and tertiary healthcare facilities and in urban areas. This has implications in terms of accessibility of HIV testing to the rural population (that make-up two-thirds of the population).[73]

2.4 Uptake of HIV Counselling and Testing

HIV Counseling and Testing has been recognized as an integral element of effective HIV public health primary prevention and care programme.[74] It has been described as a confidential dialogue between the counselor and the patient, with the aim of assessing the risk level and encouraging the making of personal decisions to prevent infection or to enable them cope with stress and other problems related to HIV infection.[75] An important step in the control of HIV epidemic is the identification of infected individual, therefore HCT is an important concept developed in this direction. In Africa there is a distinct lack of HIV testing programs. Research conducted in some other countries of Sub-Saharan Africa such as Kenya, Ghana and Uganda equally reported low uptakes of HCT as well. For example, in Kenya, the national HCT uptake was reported to be 20%; in Ghana, the HCT uptake was reported to be 16.9 and 12.7% among women and men respectively; while a regional study conducted among men in Uganda reported an uptake of 23.3%.[76] In South Africa on the other hand, the HCT uptake was reported to have progressively increased from 25.0% in 2002 to 50.0% in 2008 and further increased in 2012. It is among the few countries in the world that has achieved such success with HCT during the past few years. It's neighbour, Botswana, started implementing routine provider-initiated HCT way back in 2004, and by 2008 had achieved near parity between the two sexes (with 61.5% for females and 59.0% for males) in terms of testing for HIV and having received the results of such testing in the last 12 months. Although South Africa started provider-initiated HCT four years later and had very low rates of testing, it is now showing some progress on this indicator: 37.5% among males and 52.6% among females in 2012. Indeed, the national HCT campaign in South Africa has been largely credited for the success in getting over two million people onto ARV treatment to date.[77] Reports from other national and regional studies conducted within the country

corroborate the findings in this study. For example, the 2013 Nigerian Demographic and Health Survey conducted to assess awareness of HIV testing services, respondents were asked whether they knew where to get an HIV test and whether they had ever been tested for HIV. Respondents who reported that they had been tested for HIV were asked whether they received the results of their last test, overall, 60 percent of women and 71 percent of men know a site where they can get an HIV test, an improvement since the 2008 NDHS (when the figures were 49 percent and 65 percent, respectively). Knowledge of a place for HIV testing is highest among sexually active women and men who have never been married (83 percent and 86 percent, respectively) and among urban women and men (77 percent and 81 percent, respectively). Knowledge of where to get HIV testing increases with increasing education and wealth. Across age groups, the youngest female and male respondents (age 15-19) are least likely to know a place where they can go to be tested for HIV (51 percent and 56 percent, respectively). By marital status, never-married women and men who have not yet initiated sexual activity are least likely to know a place to obtain an HIV test (57 percent each). [78] Among the zones, women's and men's knowledge of a place to get tested for HIV is lowest in the North West (39 percent and 55 percent, respectively). Respondents' experience with prior HIV testing and whether they received their results showed overall, one in four women have been tested for HIV and received the result of the last test but among men, the corresponding proportion is 20 percent; one in five. Seven in 10 women and 78 percent of men have never been tested for HIV. Among women and men tested for HIV in the past 12 months, only 10 percent each received their test results. However, this was an improvement of 3 percentage points from the figure recorded in the 2008 NDHS (7 percent each), furthermore, Urban women were more likely than rural women to have been tested for HIV in the past 12 months and to have received the test results (14 percent and 7 percent,

respectively). The proportion of women and men who had been tested in the past 12 months and had received the results of their last test was lowest in the North West and highest in the South-South. Coverage ranged from 4 percent in the North West to 17 percent in the South South among women and from 2 percent in the North West to 17 percent in the South-South among men. Among the states, the percentage of women who had been tested for HIV in the past 12 months and received the results of their last test was highest in Cross River (33 percent) and lowest in Kebbi (1 percent). Among men, the corresponding proportions were 30 percent in Cross River and 1percent in Kebbi and Zamfara. It is noteworthy that the prevalence of HIV testing is very low in Kano, especially among men. Less than 1 percent of men know their status, and none of them reported having been tested in the past 12 months and receiving the results of their last test. No doubt there are still challenges.[78] The proportion of health facilities in the country offering HCT, ART and PMTCT services is still low with more access in urban than rural areas. Also, the proportion of the general population that has ever been tested for HIV is low at 26%. ART coverage for children less than 15 years has witnessed some improvement but remains low at less than 12%. PMTCT coverage has also improved but is still low at 30%. There are still challenges with mobilizing adequate resources as well as infrastructure, human and technical capacity gaps at all levels of the health system particularly at the subnational levels.[78]

2.5 Individual factors affecting HCT uptake

Individual factors such as knowledge of HCT, attitude and perception, affect uptake of HCT; Despite the potential benefits of VCT, uptake is often poor regardless of the availability of the services. Several possible individual contributing factors could be associated with uptake of HCT; socio- demographic characteristics, awareness/knowledge related to HIV/AIDS.[79-81] A descriptive cross sectional study to determine individual attitude and perception among health

workers to routine HIV screening in the North-central Nigeria revealed that majority of the respondents (90%) showed willingness, that HIV screening is necessary and advantageous to couples intending to get married, although more than half of the respondents (56.7%) believed that the screening exercise is associated with some disadvantages, as many as 68.3% were even in support of its enforcement for all couples, many of them (88.3%) would prefer that health facility be used as screening centers, and medical doctors should be the person to reveal the test result. Sixty percent (60%) respondents felt that the decision should be made by the couple. [82, 47] In another study conducted in 2006, on knowledge, attitude and practice of voluntary counseling and testing for HIV/AIDS among undergraduates in a polytechnic in South-western Nigeria, showed that 63.2% of the respondents were aware of HCT with 59.1% having heard of it at least one year prior to the study. Mass media was the highest source of information on HCT, most of the respondents did not know where HCT services could be obtained. However, 69.8% approved the necessity of counseling prior to testing and 64.3% were ready to take a positive result in a good fate. Pre-marital testing was the second commonest reason for taking HIV test; 18.8%. Majority of the respondents; 74.2% were willing to go for HCT. Among those who were willing, the commonest reason given was that they believed they were not infected. [83]

2.4 Community attitudes affecting HCT uptake

There is a range of community attitudes affecting HCT uptake; varying from availability of services, worries about confidentiality, stigmatization and fear of HIV test.[84] Many have described the HIV/AIDS epidemic as an epidemic of ignorance, fear and denial leading to stigmatization of and discrimination against people living with HIV/AIDS and their family members.[85,86] In a study on knowledge of HIV/AIDS and attitude towards voluntary counseling and testing among adults in North-western Nigeria in 2006, showed that majority of respondent

(59%) did not even know the causative agent of AIDS: however knowledge of the route of transmission was high, with 71% and 64% of the participants mentioning sexual activity and unscreened blood transfusion respectively. Overall 27.6%, 38.1% and 34.3% of the respondents had good, fair and poor knowledge of HIV/AIDS respectively. After adjusting for confounders, gender and formal education remained significant predictors of HIV/AIDS knowledge. Reasons for rejection to HCT uptake include fear of stigma, and cost of treatment. Formal education and female gender were significantly predicted positive attitude towards HCT uptake. They concluded that more than half of the respondents had adequate knowledge of HIV/AIDS and majority were willing to have HCT, however, misconceptions, fear, gap in knowledge and limited access to HCT remain prevalent. Their findings suggest the need to provide health education and scale up HCT services in underserved rural areas.[87] Another study conducted in South-western Nigeria, reported that respondents that had never thought of having HIV test done, fear of positive test result (30.9%), not sexually active (24.7%) and perceived exemption from infection (17.3%) were the most reported reasons why respondents thought they did not require HIV test. However, 16% and 11.1% reported fear of stigma and discrimination, and fear of rejection by loved ones as their reasons why they think they did not require HIV test.[71]

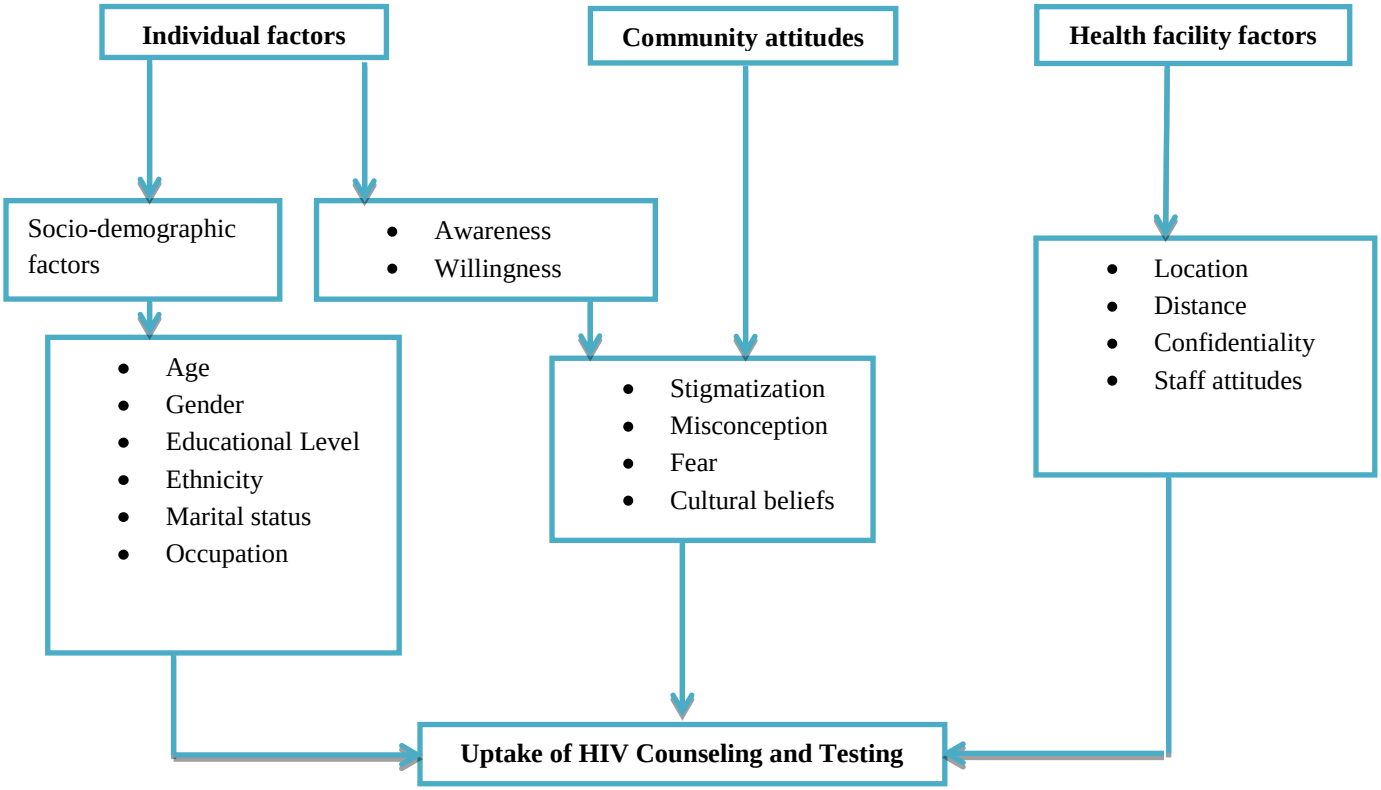
2.5 Health Facility Barriers affecting HCT Uptake

Apart from individual factors affecting uptake of HIV Counselling and Testing, there are several others that are traceable to facilities where HCT are been conducted. Studies of health care utilization repeatedly document the importance of barriers to access, including availability and distance to a facility, cost of services, transportation and time constraints. The fact that these factors may influence the decisions to seek HIV testing as well as the decision to return for results is suggested by global statistics showing low use of testing services, A study conducted in

Nigeria and Zimbabwe similarly revealed that a large proportion of young adults in both countries considered themselves as being not at risk for HIV/AIDS. Nonetheless, those that had at one time or the other thought of having HIV test done indicated lack of access to a screening facility (40.3%), inconvenient testing hours (32.8%) and lack of trust in health care system due to attitude of health care workers in health facilities (13.4%).[88] Scared of results, fear of psychological effects and stigma is in agreement with a study carried out in South Africa that indicated only one in five people who knew about HCT have been tested for HIV however the reasons that South Africans gave for not seeking HIV testing were negative perceptions of testing services. This study explored why there was still low HCT uptake in the district despite the availability of youth friendly services. Adults and young people often did not seek HCT because they fear being seen at a testing site or having health care personnel tell others that they have to be tested. Another study conducted in 2015 found that confidentiality is a major concern affecting HCT uptake and people expressed concerns that the HIV counselor would reveal their HIV status to partners or parents/family.[89] According to another study conducted in Tanzania in 2014, the perceived lack of confidentiality is a primary barrier for low testing rates for HIV testing in developing countries.[90]

2.6 Conceptual frame work of the study

The conceptual frame work of this study adopted and adapted from a study done in Uganda, by Mwenyango [56] shows the Individual, Community and Health facility factors that affect uptake of HCT services among Adults in Bunkure. The individual factors are socio-demographic characteristics; age, gender, educational level, ethnicity, marital status, occupation as well as awareness and willingness to HCT uptake, the community factors; cultural belief, stigmatization, misconceptions and fear of the test and influenced of service delivery; distance, location, confidentiality and health workers attitudes which may negatively influence uptake of HCT. These might result in increased HIV/AIDS morbidity and mortality.



Conceptual frame work of the study

CHAPTER THREE

METHODOLOGY

3.1 Study Area

Bunkure is one of the 44 LGAs in Kano State Nigeria's geopolitical North-west which is the economic and commercial nerve center of the region and the country's most populated state. Despite a relatively low HIV prevalence of 3.4%, a large population size and high fertility rate make Kano State one of the 12+1 states accounting for 70% of the national burden of mother-to-child transmission of HIV (MTCT). It is among the priority states based on the state's huge population and high fertility rate. The state has a total of 1,346 Health Facilities (HF) comprising 2 tertiary, 34 secondary, 1066 Primary and 244 private Health Facilities across the 44 Local.

Bunkure with headquarters in Bunkure town has an area of 487 km^2 and a population of 170,891 at the 2006 census with projected 236,441 population in 2016 and has 10 wards; Barkum, Bono, Bunkure, Chirin, Gafan, Gurjiya, Gwamma, Kulluwa, Kumurya and Sanda. Most of the inhabitants are Hausas, predominantly Muslims and farming is their major occupation. The LGA has only 5 sites that provide ANC services. [11] Data from the LGA M/E unit (2016) show the LGA has 22 health facilities out of which only 2 facilities render PMTCT. Among the 2 facilities only one renders PMTCT, HCT and ART which started in September, 2014. In 2015 Bunkure ward PHC recorded 1539 clients that obtained PMTCT services, 475 obtained HCT services and only 10 people were placed on ART. The second Heath clinic in Gafan ward recorded 87 clients that obtained PMTCT services.[7,8]

3.2 Study Design

The design used in this study was cross sectional descriptive.

3.3 Study Population

Adults (both male and female) between 15 years and above residing in Bunkure LGA

3.3.1 Inclusion criteria

Adults who were residents of Bunkure for over a year

3.3.2 Exclusion criteria

Adults who were residents of Bunkure for over a year but found to be too sick to be interviewed.

3.4 Sample Size Determination

A sample size of 350 was obtained using the hypothesis testing method and based on the following assumptions: 95% confidence level, proportion of uptake of HCT 26.3% from previous study [57] and 5% margin of error. The calculated minimum sample was adjusted by 15% to account for anticipated subject non-response.

$$n = \frac{z^2 pq}{d^2}$$ [58]

Where: n = Minimum sample size

z = Point on the normal distribution curve equivalent to 95% confidence interval =1.96

p = Proportion of HCT uptake (26.3%) obtained from National prevention plan 2014-2015

q = Complementary probability of p; 1-p (1 – 0.263 = 0.737)

d = Degree of precision or margin of error 0.05

NR = Non-response 15% = 0.15

Substituting these values into the formula

$$n = \frac{(1.96)^2 \times 0.263 \times 0.737}{(0.05)^2} = 298$$

Adjusted by15% for non-response = n / (1- NR) = 298/1- 0.15 = 350

3.5 Sampling Technique

Multi-stage sampling technique was used for the selection of respondents. A total of 350 houses were selected from randomly selected settlements in the selected wards.

Stage 1: Selection of 3 wards from the 10 wards in Bunkure LGA by simple random technique

Stage 2: Selection of 2 settlements from the 3 selected wards also by simple random technique making a total of 6 wards, Spinning a pen to determine the starting point in each of the settlement was done at the middle of each of the selected settlement. The house pointed by the head of the pen was first selected and list of households in each house was made.

Stage 3: Selection of household from the list of households was done by simple random technique. Selection of one respondent from each household was done by simple random technique. Samples were proportional to population size.

3.6 Study instruments

The study consists of the following items:

- Questionnaires- English and Hausa translated versions
- Consent forms- English and Hausa translated versions
- Bunkure LGA map
- Writing materials
- Computer laptop for quick data entry.

Data collection instrument was adopted from a study conducted in Uganda by Mwenyango adapted and translated into Hausa language and back to English during data entry.

The pre-tested semi-structured questionnaire consists of:

Opening introduction (preamble)

Section A: Socio-demographic data

Section B: Individual factors affecting uptake of HCT

Section C: Community factors affecting uptake of HCT

Section D: Health facility barriers affecting HCT uptake

Appreciation

3.7 Data collection methods

Advocacy visit to LGA and community leaders was done to explain purpose of the study, procedure and the benefits, to elicit their support. Eight research assistants were selected from Bunkure health facilities and trained for three days on manner of approach, how to administer a structured, interviewer administered questionnaire containing both open and closed-ended questions, as well updating their knowledge on HIV related issues. After writing a pre-test and post-test, six were selected for the field work.

The content of the questionnaire was translated into Hausa local language for easy response. Three teams were formed each team was made up of a male and female so as to facilitate access to female respondents in purdah. Informed consent was obtained from prospective respondents prior to commencement of interview. The questionnaire was pre-tested in a Barkum, one of the

wards in Bunkure LGA which was not among the randomly selected wards. Appropriate modifications were made and then data collection commenced in the 6 selected settlements. Supportive supervision on administration of questionnaires was made by the researcher and some minor issues were clarified throughout the period of data collection.

The questionnaires were checked thoroughly for completeness and errors before living the field. Data collected was immediately entered into Epi-Info® 6.0 statistical software package (CDC Atlanta, GA) in the Researcher's personal computer.

3.8 Data management

3.8.1 Measurement of variables

- **Dependent variables**: Uptake of HIV counselling and testing
- **Independent variables:**
    - Individual factors; age, gender, marital status, educational level, ethnicity, occupation, awareness of site of HCT and willingness to do HCT.
    - Community attitudes: cultural belief, stigmatization, fear of test and misconception.
    - Health facility barriers: location, distance, confidentiality and attitudes of health workers.

3.8.2 Statistical analyses

The data was analyzed using the Epi-Info® 6.0 statistical software package (CDC Atlanta, GA). Results were presented as follows:

Univariate analysis was carried out and descriptions of respondents made: Quantitative data; age was presented numerically in range, mean and standard deviation, while qualitative data; age

categories, gender, ethnicity, marital status, educational level, occupation in frequency and proportion presented on simple table while knowledge of HCT site and willingness to do HCT as well as previous HCT uptake were presented in graphs. Other community and health facility factors were also presented as frequency and proportions in tables.

Bivariate analysis was done for associations between independent factors (individual, community and health facility barriers) and dependent variable (uptake of HCT). Odds ratios and chi-square tests were used to determine the associations at 95% confidence interval. Chi square test was used to assess significance association between independent variables (individual factors, community attitudes and health facility barriers) and the dependent variable (uptake of HCT).

Multivariate analysis was applied to variables that were significant after bivariate analysis; Logistic regression was used to identify the significant factors affecting uptake of HCT with the level of significance set at $P<0.05$ so as to reject or fail to reject Null hypothesis. Results were presented in form of text, numerical values, tables and graphs.

3.8 Ethical Consideration

Ethical approval was obtained from Kano State Ministry of Health Ethical committee that the study will be beneficial and will not cause any harmful effect. Permission from health department Bunkure LGA was obtained after explaining the purpose of the study and the benefits.

An informed consent from respondents was obtained and assurance given. For justice, the participants have the right to voluntarily accept or reject to participate and also to skip any distressing questions if they wish.

For confidentiality of data storage, a pass word was used in the computer. Confidentiality maintained throughout the study and non-personal identifiers were used during data entry and analysis.

3.8 Limitations of the study

Participants were uncomfortable with giving the true information about certain questions, as HIV is a sensitive topic, however the research assistants assured the respondents that the information obtained is confidential and the respondent's names were not indicated.

Despite reassurance some options were still not answered.

The study lack scientific means of verifying how truth is the information given by the respondents in this study.

The study consider only a few factors affecting uptake of HCT as there are more other important factors such as socio-economic status, peer group and partner's influence that were not considered, as such the researcher narrowed his conclusions to few selected factors, therefore further analysis and more research may be helpful.

CHAPTER FOUR

DATA ANALYSIS

4.1. Socio-demographic characteristics

Table 1: Socio-demographic characteristics of the respondents for HCT uptake in Bunkure

Variables		Frequency	Percentage
Age range:	15-24	63	18.00
	25-34	129	36.80
	35-44	85	24.29
	45-54	55	15.71
	55-64	18	05.14
Gender:	Male	170	48.57
	Female	180	51.43
Marital status:	Divorced	03	0.86
	Separated	05	1.43
	Married	301	86.00
	Single	41	11.71
Highest educ. Level:	None	200	57.14
	Primary	109	31.54
	Secondary	12	9.14
	Tertiary	09	2.57
Ethnicity:	Fulani	25	7.14
	Hausa	314	89.71
	Others	11	3.14
Occupation:	Farming	179	51.14
	Trading	68	19.43
	Cattle rearing	11	3.14
	Civil servant	10	2.86
	Full term housewife	60	17.14
	Others	22	6.29

Age range of respondents 25-34 years, had the highest proportion (36.8%), with female (51.4%) more than male (48.6%), majority (86.0%) were married with more than 50% had no formal education, and however, majority were Hausa (88.71%) farmers (>50%).

Age range: 16 – 62years **Mean age**: 34.5years **Standard deviation:** 10.9

4.2. Specific objective 1: Individual factors affecting HCT uptake among adults

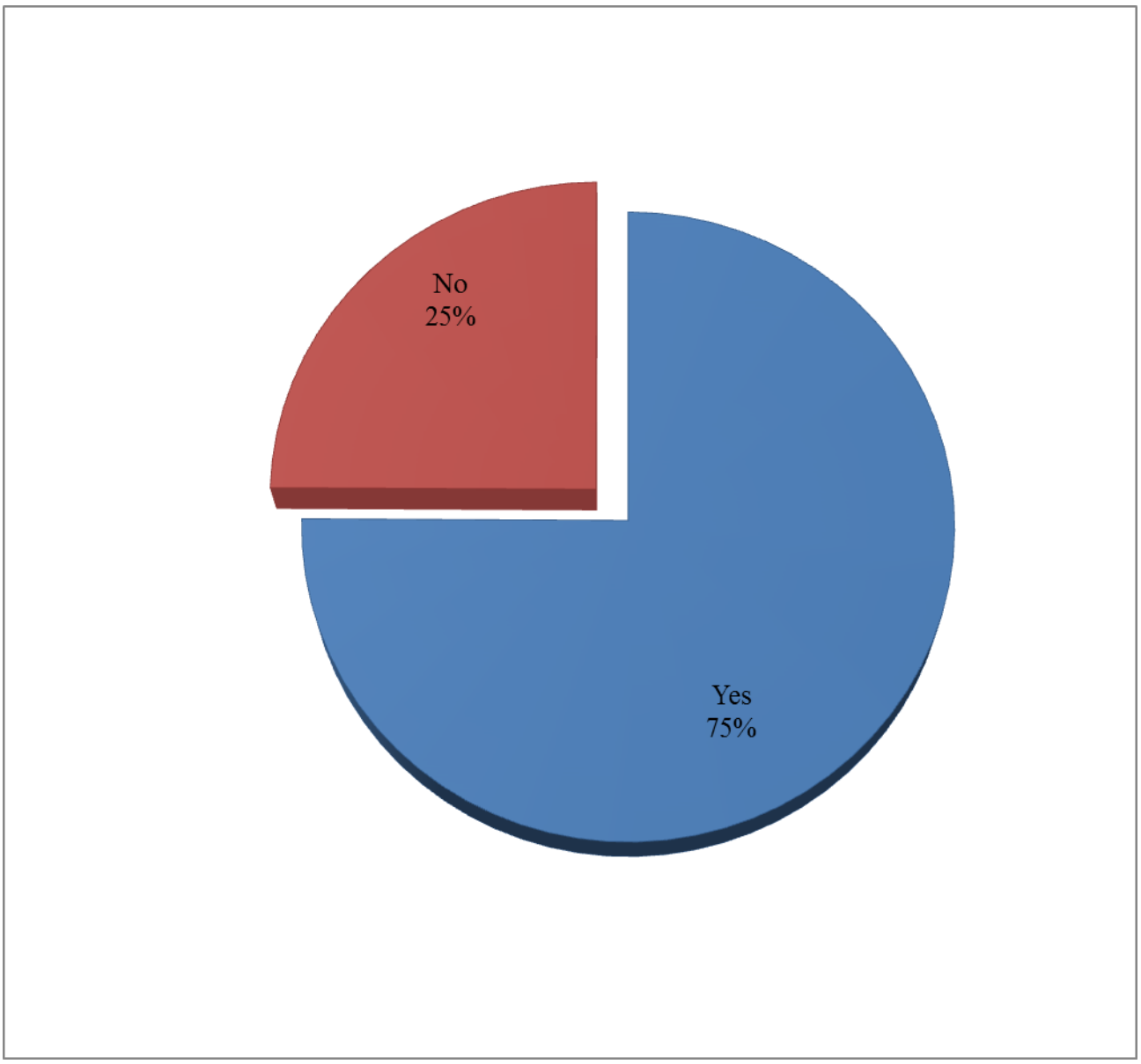


Figure 1: Proportion of respondent's awareness of HCT site in Bunkure, 2016

Majority of respondents (75%) were aware of HCT site in Bunkure while 25% were not

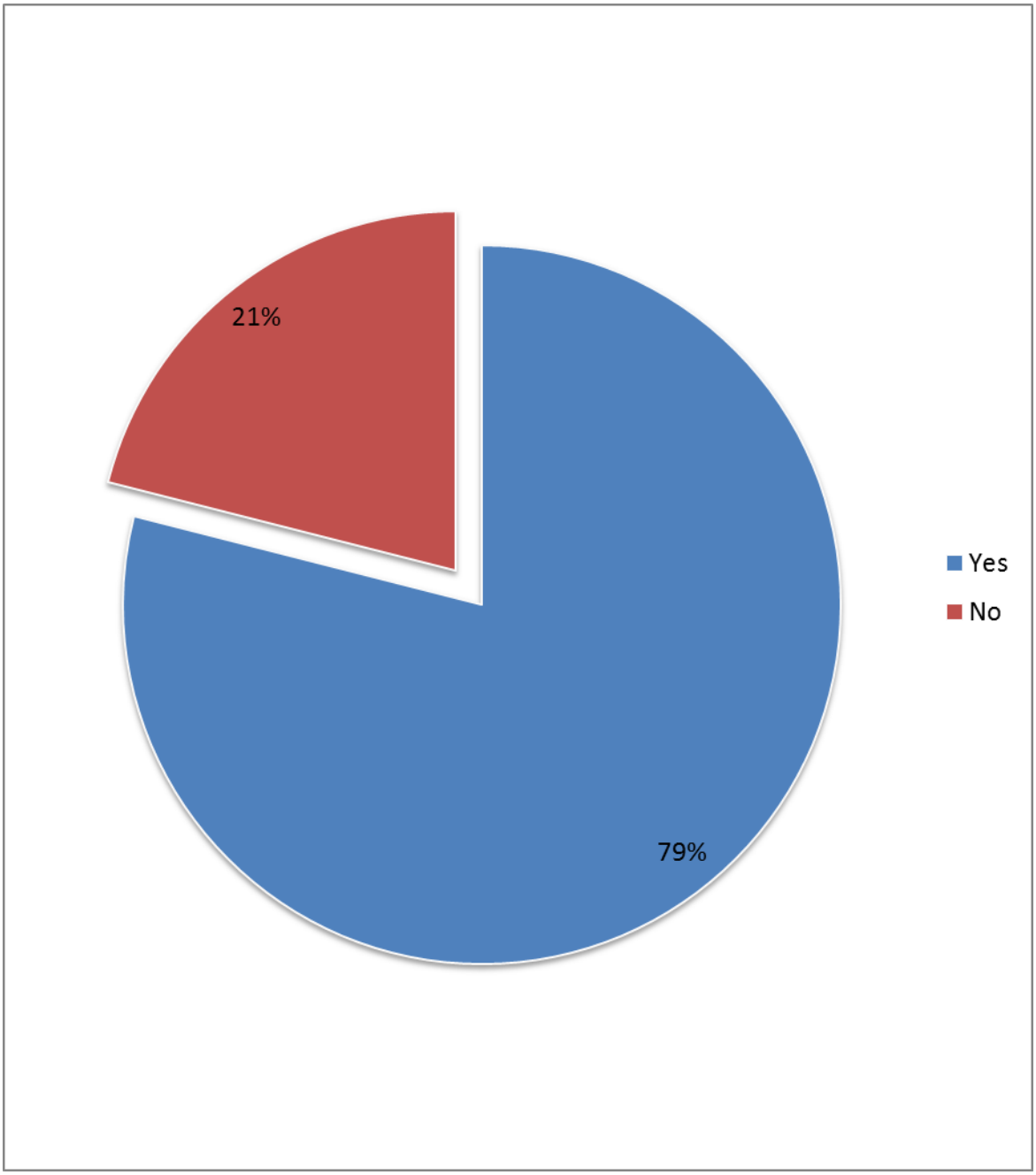
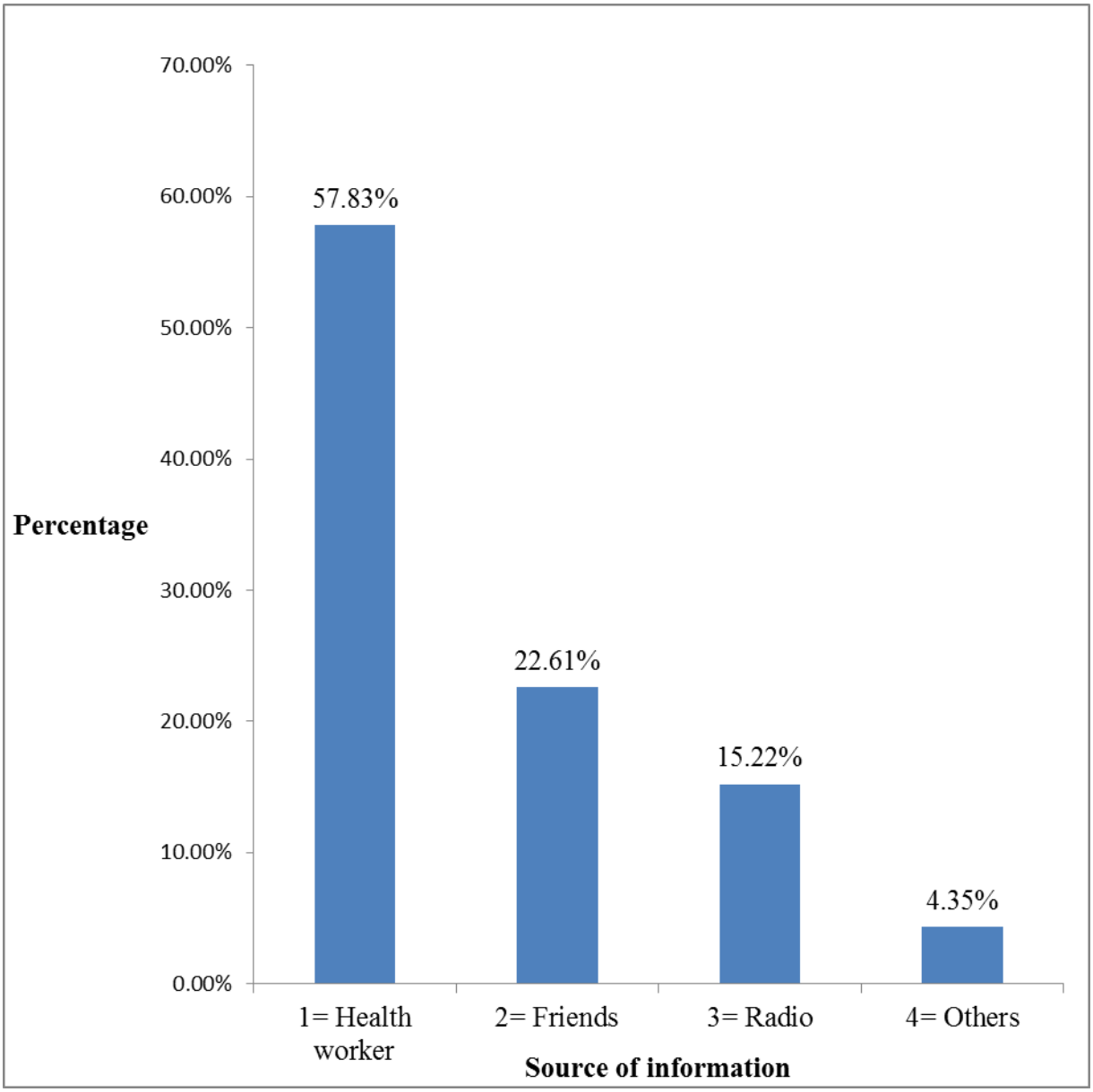


Figure 2: Proportion of respondent's willingness to HCT uptake in Bunkure 2016

Majority of the respondents (79%) were willing to do HCT while 21% were not



*Others: Relatives, partner, religious leader

Figure 3: Source of information about site of HIV Counseling and Testing in Bunkure 2016

Majority of the respondents (57.83%) hard about the site of HCT uptake in Bunkure through health workers, some through friends (22.61%) and radio (15.22%)

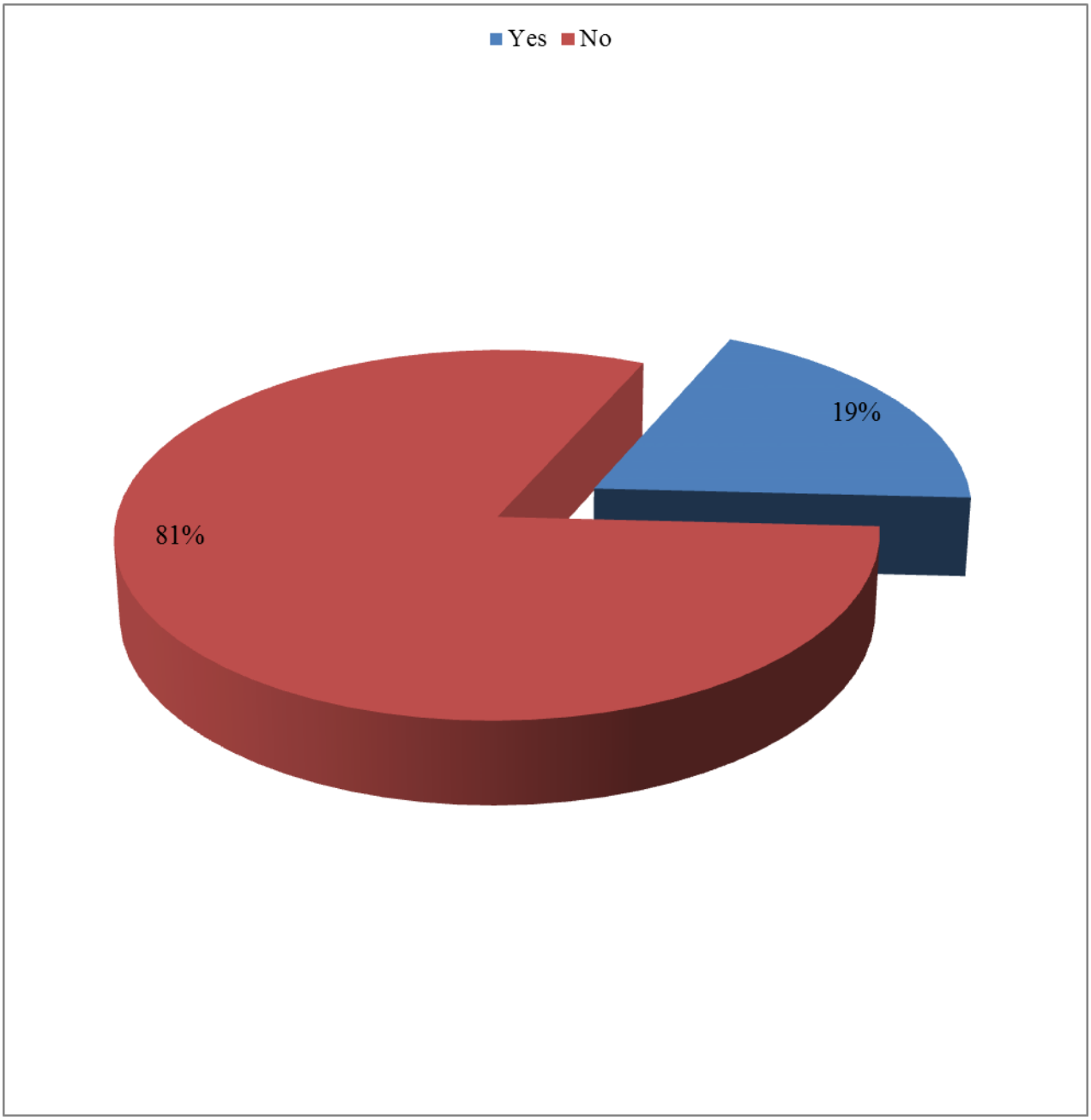


Figure 4: Proportion of respondent's previous uptake of HCT from Jan, 2015 – Jan. 2016

HCT uptake in Bunkure was low, as only 19% of the respondents had previously tested for HIV

4.3 Specific objective 2: community attitudes affecting HCT uptake

Table 2: Distribution of responses to community attitudes towards HCT uptake by respondents

Community factors	Yes Frequency/percentage	No Frequency/ percentage	Total
Cultural belief	258 (73.71%)	92 (29.29%)	350 (100%)
Stigmatization	304 (86.86%)	46 (13.14%)	350 (100%)
Fear of test	247 (70.57%)	103 (29.43%)	350 (100%)
Misconception	40 (11.43%)	310 (88.57)	350 (100%)

Majority responded that cultural belief (73.71%), stigmatization (86.86%) and fear of test (70.57%) were community factors affecting uptake of HCT in Bunkure.

4.4 Specific objective 3: health facility barriers affecting HCT uptake

Table 3: Distribution of responses to health facility barriers to HCT uptake by respondents

Health facility barriers	Yes Frequency/proportion	No Frequency/ percentage	Total
Location of facility	245 (90.07%)	27(9.9%)	272 (100%)
Distance to nearest unit	226 (83.09%)	46 (16.91%)	272 (100%)
Confidentiality issues	167 (65.23%)	89 (34.77%)	256 (100%)
Staff attitudes	36 (14.52%)	212 (85.48%)	248 (100%)

Majority responded that location of facility (90.07%), distance (83.09%) and confidentiality issues (65.23%) were health facility barriers to uptake of HCT in Bunkure.

4.5 Bivariate analysis of specific objective 1

Table 4: Individual factors associated with uptake of HCT at bivariate analysis

Variable	Tested Frequency/percentage Yes	No	OR	95% CI	P- Value
Age: young adults (15-24yrs)	13(20.6)	50(79.4)	1.1219	0.5694-2.3104	0.7396
Adults (≥25yrs)	54(16.0)	283(84.0)			
Gender: Male	19(11.2)	151(88.8)	0.3460	0.1987-0.6182	0.0002
Female	48(26.7)	132(73.3)			
Marital status: Married	62(20.6)	239(79.4)	2.2828	0.8686-5.9996	0.0863
Not married	5(10.2)	44(89.8)			
Educ. status: Formal educ	38(25.3)	112(74.7)	2.0006	1.1672-3.4290	0.0108
No formal education	29(14.5)	171(85.5)			
Occupation: Farmers	31(17.3)	148(82.7)	0.7855	0.4605-1.3397	0.3747
Non-farmers	36(21.1)	135(78.9)			
Ethnicity: Hausa	62(19.7)	252(80.3)	1.5254	0.5699-4.0831	0.3976
Non- Hausa	5(13.9)	31(86.1)			
Awareness of HCT site: Yes	63(28.3)	160(71.7)	0.9318	2.8305-30.6769	0.00001
No	5(6.8)	69(93.2)			
Willingness to do HCT: Yes	66(24.1)	208(75.1)	22.8462	3.1139-167.6164	0.00006
No	3(4.1)	70(95.9)			

HCT uptake was significantly associated with gender in favor of female twice (26.7%) the no. of male (11.2%) that previously tested (OR 0.3 CI 0.1983-0.6182 p = 0.0002), having formal education (OR 2.0, CI 1.1672-3.4290 p= 0.0108), awareness of HCT site (OR 0.9 CI 2.8305-30.6769 p=0.00001), and willingness to do the test (OR 22.8 CI 3.1139-167.6164 p= 0.00006).

4.6 Specific objective 2: Bivariate analysis of perceived community attitude towards HCT uptake

Table 5: Community factors associated with low uptake of HCT at bivariate analysis.

Variable		Tested Frequency/percentage Yes	No	OR	95% CI	P- Value
Culture belief :	Yes	51(19.8)	207(80.2)	1.1703	0.6295-2.1757	0.6182
	No	16(17.4)	76(82.6)			
Stigmatization:	Yes	44(14.5)	260(95.5)	0.1692	0.0874-0.3276	<0.00001
	No	23(50)	23(50)			
Fear of test:	Yes	33(13.4)	214(86.6)	0.3129	0.-1805-0.5427	0.00002
	No	34(33)	69(67)			
Misconception :	Yes	9(22.5)	31(77.5)	1.2614	0.5695-2.7937	0.5663
	No	58(18.7)	252(81.3)			

Low HCT uptake was significantly associated with stigmatization (OR 0.2, CI 0.0874-0.3276 p=<0.00001) and fear of test (OR 0.3, CI 0.1805-0.5427, p=0.00002)

4.7 Specific Objective 3: Bivariate analysis of Health service barrier associated with uptake of HCT

Table 6: Health facility factors associated with low uptake of HCT services at bivariate level

Variable		Tested Frequency/percentage		OR	95% CI	P- Value
		Yes	No			
Location :	Yes	63(25.7)	182(74.3)	1.9904	0.6627-5.9781	0.2122
	No	5(18.5)	22(81.5)			
Distance:	Yes	65(31.1)	144(68.9)	4.2582	0.9701-18.954	0.4339
	No	2(9.5)	19(90.5)			
Confidentiality:	Yes	42(25.1)	125(74.9)	1.1592	0.6310-2.1297	0.6339
	No	20(22.5)	69(77.5)			
Staff attitude :	Yes	6(16.7)	30(83.3)	0.5709	0.2255-1.4452	0.2321
	No	55(25.9)	157(74.1)			

There was no significant association between HCT uptake and health facility factors ($p > 0.05$)

4.8 Multivariate analysis

Table 7: Logistic regression analysis:

Variable	OR	95% CI	P- Value
Educational level:			
Primary/ None	1.2046	0.5797-2.5033	0.6174
Secondary/None	0.4621	0.1255-1.7019	0.2458
Tertiary/None	7.0340	1.3406-36.9056	0.0211
Gender:			
Male/ Female	5.1043	2.3728-10.9803	0.0000
Awareness of HCT site:			
Yes/No	16.7840	3.7908-74.3111	0.0002
Willingness to do HCT			
Yes/No	4.6828	0.5449-40.2409	0.1595
Stigmatization:			
Yes/No	17.0285	5.6770-51.0775	0.0000
Fear of test:			
Yes/No	1.9073	0.9359-3.8868	0.0755

There was Significant relationship exist between uptake of HCT and tertiary education (p=0.0211), gender in favor of female (0.0000) awareness of site of HCT (p=0.0002) and stigmatization (p=0.0000).

CHAPTER FIVE

DISCUSSION

The socio-demographic characteristics result showed that the age range of the respondents was between 16-62years, with 16years as the minimum age, this was in conformity with the average marriage age for female in Northern Nigeria, as 48% of Hausa-Fulani girls were married by age of 15yrs.[94] Age range revealed that those between 25-34years had the highest proportion of 36.8% and the mean age was 34.5years ± 10.9. Gender proportion showed more females than males, this may be because male youths were hardly found at home during the survey because they were either on the farms or schooling away from home. Majorities were married and the level of formal education was low which might have contributed to low uptake of HCT. The respondents were predominantly Hausa farmers and traders typical of Northern Nigeria. Awareness of HCT was higher than the national value reported in 2013,[63] which showed only 62% of males and 61% of females knew where to get an HIV test in Nigeria. Willingness to HCT uptake showed high value similar to study done in Dambare community same North-western-region,[87] where more than half of the respondents had adequate knowledge of HIV/AIDS and majority were willing to have HCT, also similar to National value of 2013 where willingness to do the test was found to be 78% for the country and a study in North-central Nigeria [82] which found willingness to do the test as 90% and another study in South-western Nigeria which showed 74.2% were willing to go for HCT.[71] This finding may be due to high level of health education given to mothers during ANC as seen from the source of information mostly through health workers; this is different from the study conducted in South-western Nigeria [71] where the study showed mass media was the major source of information on the site of HCT. Knowledge of HCT site was high which may be due to larger number of female

respondents that might have been to Antenatal clinic. HCT uptake was found to be higher than the data obtained from the health facility record that showed 1.6% due to either inadequate documentation or the clients preferred doing HCT in different places outside the LGA for fear of stigmatization. HCT uptake in Bunkure was found to be higher than the value reported for North-western Nigeria (13%) in 2013, similar to the finding in Kenya with 20%, higher than Ghana 16.9%, less than Uganda reported in men uptake of 23.3%.[76] and less than the value obtained from South Africa were HCT uptake increased from 25% in 2002 to 50% in 2008.[77] Majority responded that cultural belief, stigmatization and fear of test were community factors that affect HCT uptake, so also location, distance of health facility and confidentiality issues as health facility barriers affecting uptake of HCT in Bunkure, similar to proportion shown in many studies done in and outside Nigeria.[84-87]

Bivariate analysis of individual factors showed that there was significant association between uptake of HCT and gender in favor of female (OR 0.3 CI 0.1983-0.6182 p = 0.0002), acquiring formal education (OR 2.0, CI 1.1672-3.4290 p= 0.0108), having knowledge of HCT site (OR 0.9 CI 2.8305-30.6769 p=0.00001), and willingness to do the test (OR 22.8 CI 3.1139-167.6164 p= 0.00006), while stigmatization (OR 0.2, CI 0.0874-0.3276 p= <0.00001) and fear of test (OR 0.3, CI 0.1805-0.5427, p=0.00002) were significantly associated with low uptake, however there was no significant association between uptake of HCT and heath facility factors on bivariate analysis ($p > 0.05$) although univariate analysis showed higher proportion responding to health facility factors as barriers to uptake of HCT.

On logistic regression, at p=0.05 at 95% CI, tertiary education (p= 0.0211), gender in favor of female (0.0000) knowledge of site of HCT (p=0.0002) and stigmatization (p=0.0000) were found to have significant statistical association with uptake of HIV counselling and testing in Bunkure

at 95% CI, $p < 0.05$. Therefore the first and second null hypothesis were rejected and alternative hypothesis accepted, since there was significant statistical association between the individual factors; education, gender and awareness of site where HCT is done as well as the community attitude of stigmatization. The study failed to reject the third null hypothesis at $p > 0.05$ as there was no significant statistical association between the perceived health facility barriers and uptake of HIV counselling and testing in Bunkure.

Targeting the significant factors affecting HCT uptake will help to improve uptake of HCT and consequently help in achieving the new ‘‘90-90-90’’ UNAIDS agenda which proposed that 90% of all people living with HIV will know their HIV status, 90% of all people with diagnosed HIV infection will receive sustained antiretroviral therapy and 90% of all people receiving antiretroviral therapy will have viral suppression by 2020 as a road map to elimination of HIV infection by the year 2030.[95]

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

6.1 Conclusion

The study showed that less than a quarter of adults in Bunkure had previously obtained HIV testing services. This is associated with individual factors; being female, having attained tertiary level of education and being aware of place where services were offered which enhanced uptake of HIV counselling and testing, and although willingness to do the test was high, community factor; stigmatization in particular hindered uptake of HIV counselling and testing while the health facility factors were less likely to affect HCT uptake in Bunkure.

6.2 Recommendations

Community level

1. The village development committee should intensify awareness campaign, to overcome the stigmatization barriers related to HIV/AIDS, through FGDs, seminars, Hausa dramas, job aides, provision of IEC materials translated into Hausa language to be distributed through VCM.
2. Advocacy visit to Religious/ community and other influential leaders to support awareness campaign against HIV/AIDS stigmatization

Health facility level

3. Health workers should expand areas of health education to include the role of men in Antenatal care HIV counselling and testing to improve HCT uptake for both gender.

Government level:

4. Bunkure LGA should strengthen the Local committee on HIV/AIDS control (LACA) through employment and training of more staff to work on HIV services at facilities and outreach mobile services to scale up HCT uptake.
5. State Ministry of Education should provide free education up to tertiary institutions and re-train teachers on family health education to reduce stigmatization.
6. Supporting Agencies should collaborate with the LGA to improve supervision, training, technical support and funding for research on HIV related areas to improve the data from 19% to 40% by the end of 2018 and reaching the new PEPFFER target of " 90-90-90 **"** model for interruption of HIV transmission by the year 2020.[60]

References

1. UNAIDS/WHO report. Voluntary counseling and testing. May 2014, Geneva, Switzerland. http://aidsinfo.unaids.org (Accessed on 5th January, 2016).

2. WHO, UNAIDS & UNICEF Report; Towards universal access: scaling up HIV/AIDS (2008). http://aidsinfo.unaids.org (Accessed on 7th January, 2016)

3. Walker N. Estimating the global burden of HIV/AIDS: what do we really know about the HIV pandemic? Lancet. 2004; 363:2180-2185.

4. Nasidi A, Harry T. Odutulo, O. The epidemiology of HIV/AIDS in Nigeria. In: Adeji O, Kanki PJ, Odutolu O, Idoko JA eds. AIDS in Nigeria: A nation on the threshold. Cambridge, MA: Harvard Center for Population and Development Studies; 2006: 17-36.

5. Wade N.A, Birkhead G.S, Warren B.L. Abbreviated regimens of Zidovudine prophylaxis and perinatal transmission of the human immune-deficiency virus. *N Engl J Med*. 1998; 339: 1409-1414.

6. Jones J.L, Hutto P., Meyer P., Dowda H., Gamble W.B, Gunn R.A. HIV sero-prevalence and reasons for refusing and accepting HIV testing, *Journal of Sexually Transmitted Diseases*, 1993; 20:334-337.

7. NHMIS monthly summary forms Bunkure LGA Monitoring and Evaluation Unit. 2015.

8. Daily HIV Worksheet, Health Information unit Bunkure, 2015.

9. Report of the Kano State-wide rapid health facility assessment in preparation for elimination of mother-to-child transmission of HIV, section 2, June 2013: 1-2 Availabled at: https://www.fhi360.org/sites/default/files (Accessed on June 2016)

10. UNAID. Global HIV and AIDS statistics AVERT, UNAID, 2015. Available at: www.avert.org (Accessed on September, 2016).

11. UNAIDS report on the global AIDS epidemic, Introduction; Historic gains, Continuing Challenges. UNAIDS, 2013: 4 Available at: http://aidsinfo.unaids.org (Accessed on 5th February, 2016).

12. UNAIDS Report. HIV/AIDS and young people, Hope for tomorrow, 2003: 7. Available at: data.unaids.org/Publications/IRC-pub06/jc785-youngpeople_en.pdf. (Accessed on 2nd March, 2015)

13. WOFAN, HIV/AIDS Awareness Programmes Report, 2016: 1-2 Available at: www.wofan-ng.org (Accessed on March 2016)

14. Oladepo O, Brieger WR., AIDS knowledge, attitude and behavioral patterns among University students in Ibadan, Nigeria. African Journal of Medical Science 1994; 23:1 19-125.

15. lliyasu Z, Kabir M, Galadanci H.S. Awareness and attitude of ante- natal clients towards HIV voluntary counseling and testing in Aminu Kano Teaching hospital, Kano, Nigeria. Niger Journal of Med. 2005; 14:27-32.

16. Igwegbe A.O, Ilika A.L. Knowledge and perceptions of HIV/AIDS and mother to child transmission among antenatal mothers at Nnamdi Azikiwe University Teaching hospital, Nnewi. Niger Journal of Clinical Practice. 2005; 8:97-101.

17. UNAIDS Report on the global AIDS epidemic; 2010 (Accessed on March, 2015).

18. Gallo R. The AIDS virus. *Sci Am*;1987. 256:46-56.

19. Saxinger WC, Levine PHY, Dean A. (1985). Evidence for exposure to HTLV-III in Uganda before 1973. Science; 227:1036-8.

20. Nahmias AJ, Weiss J, Yao X, (1959). Evidence for Human infection with HTLVIII/LAV-like virus in central Africa. Lancet; 1:1279-80.

21. Clavel F, Guetard, Brun-Vezinet F. Isolation of a new human retrovirus from West African patients with AIDS. *Science*; (1986). 233:343-6.

22. Bygbjerg IC, AIDS in a Danish surgeon (Zaire, 1976). *Lancet*; 1983 1:925.

23. Hymes, K.B. et al 'Kaposi's sarcoma in homosexual men: A report of eight cases' Lancet 2(8247): 1981, 598-600.

24. Centers for Disease Control (CDC) 'Kaposi's Sarcoma and Pneumocystis Pneumonia among Homosexual Men- New York City and California' MMWR Morbidity and Mortality Weekly Report 30(25):305-308.

25. Vilaseca, J. 'Kaposi's sarcoma and Toxoplasma gondii brain abscess in a Spanish homosexual'. *Lancet*; 1982 1(8271):572.

26. Rozembaum, W. 'Multiple opportunistic infection in a male homosexual in France'. Lancet 1982, 1(8271):572-573.

27. Francioli, P. et al'Acquired immunologic deficiency syndrome, opportunistic infections and homosexuality. Presentation of 3 cases studied in Switzerland' Schweizerische medizinische Wochenschrift. 1982, 112(47):1682-1687.

28. Serwadda, D. Slim disease: a new disease in Uganda and its association with HTLV-III infection'. Lancet, 1985. 2(8460):849-852.

29. Barré-Sinoussi, F. et al 'Isolation of a T-lymphotropic retrovirus from a patient at risk for acquired immune deficiency syndrome (AIDS),' 1983. Science 220(4599):868-871.

30. Centers for Disease Control and Prevention (CDC) 'Current Trends Acquired Immunodeficiency Syndrome (AIDS) Update - United States' MMWR Weekly. 1983, 32(24): 309-311.

31. Centers for Disease Control and Prevention (CDC) 'Current Trends Update: Acquired Immunodeficiency Syndrome (AIDS) - United States' MMWR Weekly. 1983, 32(35):465-467.

32. Marx, J.L. 'Strong new candidate for AIDS agent' Science. 1984, 224(4648): 475-477.

33. Roberts, B.D'HIV Antibody Testing Methods' Journal of Insurance Medicine. . 1994 26(1):13-14.

34. Case, K. 'Nomenclature: Human Immunodeficiency Virus' Annals of Internal Medicine. 1986, 105(1):133.

35. Office of the U.S. Global AIDS Coordinator, U.S. Department of State (2004) 'Bringing Hope and Saving Lives: Building Sustainable HIV/AIDS Treatment'.

36. UNAIDS 'Ambitious Treatment Targets: Writing the final chapter of the AIDS epidemic UNAIDS 2014 'htt/www.unaids.org/treatment_target

37. Weiss RA, Dalgleish AG, Loveday C, Pillay D. Human Immunodeficiency Viruses. In: Zuckerman AJ, Banatvala JE, Pattison JR, Griffiths PD, Schoub BD (eds). Principles and Practice of Clinical Virology. 5th ed. 2004. Chichester: John Wiley & Sons Ltd, pp721-57.

38. Kalish ML, Wolfe ND, Ndongmo CB. Central African hunters exposed to simian immunodeficiency virus. Emerg Infect Dis, 2005; 11:1928-30.

39. Korber B, Muldoon M, Theiler J. Timing the ancestor of the HIV-1 pandemic strains. Science 2000;288:1789-96.

40. Lemey P, Pybus OG, Wang B, Saksena NK, Salemi M, Vandamme AM. Tracing the origin and history of the HIV-2 epidemic. Proc Natl Acad Sci U S A 2003;100:6588-92.

41. Cleghorn FR, Reitz MS, Popovic M, Gallo RC. Human Immunodeficiency Viruses. In: Mandell GL, Bennett JE, Dolin R (eds). Principles and Practice of Infectious Diseases. 6th ed. 2005. Philadelphia: Churchill Livingstone, pp2119-2133.

42. Chirinda W., Peltzer K. Correlates of inconsistent condom use among youth aged 18-24 years in South Africa. *J. Child Adolesc. Ment. Health*. 2014;26(1):75–82.

43. Smith J., Nyamukapa C., Gregson S., Lewis J., Magutshwa S., Schumacher C., et al. The distribution of sex acts and condom use within partnerships in a rural sub-Saharan African population. PLoS One. 2014;9(2):e88378.

44. Wilson D., Halperin D.T. "Know your epidemic, know your response": a useful approach, if we get it right. *Lancet*. 2008; 372(9637):423–426.

45. Joint United Nations Programme on HIV/AIDS (UNAIDS) and World Health Organization. Practical Guidelines for Intensifying HIV Prevention; Towards Universal Access. UNAIDS; Geneva, Switzerland. 2007. ISBN 978 92 9173 557 0 (NLM classification: WC 5032).

46. Redd A.D., Quinn T.C., Tobian A.A. Frequency and implications of HIV super-infection. *Lancet Infect. Dis*. 2013; 13(7):622–628.

47. Redd A.D., Mullis C.E., Serwadda D., Kong X., Martens C., Ricklefs S.M., Tobian A.A., Xiao C., Grabowski M.K., Nalugoda F., Kigozi G., Laeyendecker O., Kagaayi J., Sewankambo N., Gray R.H., Porcella S.F., Wawer M.J., Quinn T.C. The rates of HIV superinfection and primary HIV incidence in a general population in Rakai, Uganda. *J. Infect. Dis*. 2012; 206(2):267–274.

48. Cuadros D.F., Awad S.F., Abu-Raddad L.J. Mapping HIV clustering: a strategy for identifying populations at high risk of HIV infection in sub-Saharan Africa. *Int. J. Health Geogr*. 2013; 12:28.

49. Grabowski M.K., Lessler J., Redd A.D., Kagaayi J., Laeyendecker O., Ndyanabo A., et al Health Sciences Program The role of viral introductions in sustaining community-based HIV epidemics in rural Uganda: evidence from spatial clustering, phylogenetics, and egocentric transmission models. PLoS Med. 2014;11(3):e1001610.

50. Tanser F., Bärnighausen T., Cooke G.S., Newell M.L. Localized spatial clustering of HIV infections in a widely disseminated rural South African epidemic. Int. J. Epidemiol. 2009;38(4):1008–1016.

51. Shisana O., Rehle T., Simbayi L.C., Zuma K., Jooste S., Zungu N., Labadarios D., Onoya D., et al. South African National HIV Prevalence, Incidence and Behaviour Survey, 2012. Cape Town: HSRC Press; 2014.

52. South African Department of Health. The 2012 National Antenatal Sentinel HIV and Herpes Simplex type-2 prevalence Survey, South Africa 2014; Available at http://www.health-e.org.za/wp-content/uploads/2014/05/ASHIVHerp_Report2014_22May2014.pdf . 2014. [Accessed on 30 June 2015].

53. Aliyu M.H., Varkey P., Salihu H.M., Iliyasu Z., Abubakar I.S. The HIV/AIDS epidemic in Nigeria: progress, problems and prospects. Afr. J. Med. Med. Sci. 2010; 39(3):233–239.

54. Zulu L.C., Kalipeni E., Johannes E. Analyzing spatial clustering and the spatiotemporal nature and trends of HIV/AIDS prevalence using GIS: the case of Malawi, 1994-2010. BMC Infect. Dis. 2014;14:285. doi: 10.1186/1471-2334-14-285.

55. Novitsky V., Bussmann H., Logan A., Moyo S., van Widenfelt E., Okui L., Mmalane M., Baca J., Buck L., Phillips E., Tim D., McLane M.F., Lei Q., Wang R., Makhema J., Lockman S., DeGruttola V., Essex M. Phylogenetic relatedness of circulating HIV-1C variants in Mochudi, Botswana. PLoS One. 2013; 8(12):e80589.

56. Grabowski M.K., Redd A.D. Molecular tools for studying HIV transmission in sexual networks. *Curr. Opin. HIV AIDS*. 2014; 9(2):126–133.

57. Kharsany A.B., Buthelezi T.J., Frohlich J.A., Yende-Zuma N., Samsunder N., Mahlase G., Williamson C., Travers S.A., Marais J.C., Dellar R., Karim S.S., Karim Q.A. HIV infection in high school students in rural South Africa: role of transmissions among students. AIDS Res. Hum. Retroviruses. 2014;30(10):956–965.

58. Meyer KB, Panker SG. (1987). Screening for HIV. Can we afford the false positive rate? N Engl J Med: 317:238-41.

59. UNAIDS, WHO HIV/AIDS 'Fact Sheet' Updated July 2016
Available at: http://www.who.int/mediacentre/factsheets/fs360/en/ Factsheets

60. UNAIDS 'Prevention Gap Report'. 2016. Available at:
http://www.unaids.org/preventiongap Accessed October, 2016

61. UNAIDS AIDSINFO 2016 (Accessed October, 2016).

62. UNAIDS. The GAP Report. Geneva, Switzerland: UNAIDS, 2014. Available at:
http://www.unaids.org/en/resources/campaigns/2014/2014gapreport/gapreport. (Accessed September, 2016).

63. Federal Ministry of Health. National HIV/AIDS and Reproductive Health Survey 2012 (NARHS plus II 2012). Abuja, Nigeria; 2013.

64. Federal Ministry of Health. National HIV Sero-prevalence Sentinel Survey. Abuja, Nigeria; 2010.

65. UNAIDS, HIV and AIDS estimates; 2015. Available at:
http://www.unaids.org/en/regionscountries/countries/nigeria

66. NACA. The HIV Epidemic in Nigeria; December 2015. Available at:
https://naca.gov.ng/article/hiv-epidemic-nigeria

67. NACA. NARHS: Prevalence of HIV in Nigeria 2012. Available at:
https://naca.gov.ng/nigeria-prevalence-rate (Accessed September,2016)

68. Davidson's principles and practice of Medicine, 21st edition, Churchill Livingstone Elsevier, 2010: 386-390.

69. Violari A, Paed FC, Cotton MF, et al. Early Antiretroviral Therapy and Mortality among HIV-infected Infants. N Engl J Med. 2008; 359: 2233-2244

70. Center for Disease Control (CDC) Act Against AIDS Initiative: December 7, 2015 4:21. Available at: hht//links.govdelivery.com80/tract Accessed December 2016

71. Ebenezer O. D, Acceptability and barrier to utilization of HCT among students of tertiary Institutions in Owo, Ondo state Nigeria, South American Journal of Public Health, Volume-2, Issue-1, 2014, ISSN: 2309-6470.

72. UNAIDS TERMINOLOGY GUIDELINES; Preferred terminology. Geneva: UNAIDS, 2015. Available at: www.unaids.org, cosponsor www.theglobalfund.org (Accessed February, 2016)

73. National Plan for HIV/AIDS in Nigeria; Thematic area: HIV counselling and testing NPP3, 3:37 (NPP 2014-2015).

74. Solomon S, Venkatesh KK, Srikrishman AK, Mayer KH (2008). Challenges of expansion of voluntary counseling and testing in India. Sex. Health 5(4):371-2.

75. The Society of Gynaecology and Obstetrics of Nigeria (SOGON) Manual on the management of HIV/AIDS in pregnancy, 2005.

76. Bwambale FM, Ssali SN, Byaruhanga S, Kalyango JN, Karamagi CA. Voluntary HIV counselling and testing among men in rural western Uganda: implications for HIV prevention. BMC Public Health. 2008; 8:263.

77. Shisana, O, Rehle, T, Simbayi LC, Zuma, K, Jooste, S, Zungu N, Labadarios, D, Onoya, D et al. South African National HIV Prevalence, Incidence and Behaviour Survey,2012. Cape Town, HSRC Press. 2014. Available at: www.hsrc.ac.za/en/research-data/view/6871 (Accessed October 2016).

78. Nigeria Demographic and Health Survey 2013 - The DHS Program Available at: https://dhsprogram.com/ (Accessed 0ctober, 2016)

79. Adeneye, A.K., Ogunro P.S., Ogungbamigbe T.O., Elemile P.O., etal., Willingness to seek voluntary HIV counselling and testing (VCT) among urban residents in South-West Nigeria. Proceedings of the 16th International AIDS Conference, Toronto, Canada, 2006 August 13-18.

80. Matovu JK, Makumbi FE., Expanding access to voluntary HIV counselling and testing in sub-Saharan Africa: alternative approaches for improving uptake, 2001–2007. Trop Med Int Health 2007, 12(11):1315–1322.

81. Hutchinson PL, Mahlalela X., Utilization of voluntary counseling and testing services in the Eastern Cape, South Africa. AIDS Care 2006, 18(5):446–455.

82. Musa, O.I. Health workers attitude and perception towards routine pre-marital HIV screening. African journal of clinical and experimental microbiology, 2005; 6, (1): 46 52.

83. Ikechebelu I.J., Udigwe G.O., Ikechebelu N., Imoh L.C. The knowledge, attitude and practice of voluntary counseling and testing for HIV/AIDS among undergraduates in a polytechnic in southeast, Nigeria. Nigerian journals of Medicine 2006 Jul-Sep; 15(3):245-9.

84. De Paoli, M,M, Manongi R, Klepp K.I. Factors influencing acceptability of voluntary counselling and HIV-testing among pregnant women in northern Tanzania. *AIDS Care* 2004;16:411-425.

85. Kidanu A., Mbwambo J., Nyblade L., Bond V., A multi- country study understanding HIV related stigma and discrimination. Dar es Salaam: University of Dar es Salaam; 2001. 19. Available at: www.bioline.org.br/pdf?lp08011 (Accessed October, 2016)

86. Parker R, Aggleton P, HIV and AIDS-related stigma and discrimination: a conceptual framework and implications for action. *Soc Sc Med* 2003; 57:13-24.

87. Iliyasu Z., Abubakar I.S., Kabir M. & Aliyu M.H., Knowledge of HIV/AIDS and attitude towards Voluntary Counseling and Testing among Adults, Journal of the National Medical Association, 2006; 98 (12): 1917-1922.

88. Akande A AIDS-related beliefs and behavior of students: evidence from two countries (Zimbabwe and Nigeria) International Journal of Adolescents and Youths,1994 4:285-303.

89. Strauss M, Rhodes B, George G. A qualitative analysis of the barriers and facilitators of HIV counselling and testing perceived by adolescents in South Africa. BMC Health Services Research, 2015 15(250): 1-12.

90. Njau B, Ostermann J, Brown D, Mühlbacher A, Reddy E, Thielman N. HIV testing preferences in Tanzania: A qualitative exploration of the importance of confidentiality, accessibility, and quality of service. BMC Public Health, 2014; 14(838): 1-9.

91. Mwenyango I, Factors Affecting Uptake of Voluntary Counseling And Testing Services among Youth in Rukungiri District, Uganda, 2010, 3:10 Available at: makir.mak.ac.ug/handle/10570/2859. (Accessed June, 2015)

92. Lwanga S, Lemeshow S. Sample size determination in health studies: a practical manual, Geneva, Word Health Organization; 1991.

93. Donna J, Michael A. J, Nsubuga P. et al, Biostatistics Workbook, Field Epidemiology and Lab Training programs (FELTP), sample size for descriptive study CDC, Draft, Aug. 28, 2007:182.

94. United Nations Population Fund report 'Early marriage in Nigeria'
Available at: http://nigeria.unfpa.org/ nigeirachild.html (accessed 10 March, 2015).

95. UNAIDS 90-90-90. An ambitious treatment target to help end the AIDS epidemic Available at htt://unaid.ambitious treatmenttarget Accessed December, 2016.

Appendices

Department of Community Medicine, AHMADU BELLO UNIVERSITY, ZARIA

Questionnaire on Factors affecting uptake of HCT among adults in Bunkure Kano state

I am a final year Post graduate student of Ahmadu Bello University Zaria conducting a community based study to assess factors affecting uptake of HIV Counseling and Testing among Adults in Bunkure LGA Kano state for the purpose of obtaining Master degree in Field epidemiology. All information provided will be treated with utmost confidentiality. Your Participation is voluntary and will highly help to control such disease.

Name of interviewer……..Date……..

Ward……..Settlement……Questionnaire No…….

SECTION A: Socio-demographic data

1. Age…… 2. Gender 1= Male [ ]. 2=Female [ ].

3. Religion: 1=None [ ] 2= Islam [ ]. 3= Christianity [ ] 4= Others (specify)……

4. Highest education Level?

1=None
2=Primary
3=Secondary
4=Tertiary

5. Marital status?

1=single [ ].
2=married [ ].
3= separated/divorced [ ]

6 Occupational status?

1= farming
2= trading
3= cattle rearing
4= Civil servant 5=other (specify)……

7. Ethnicity?

1= Fulani [ ] 2= Hausa[ ]
3=Yoruba [ ] 4=Igbos [ ]
5=others (specify)……..

SECTION B: Factors affecting uptake of HCT

1) Individual factors affecting uptake of premarital HCT

I- Awareness on HIV Counseling and Testing

8. Could you please tell me how you can find out if one has the germs (virus) that causes AIDS .Tick only one

1= Taking an HIV test [ ].

2= Doctor's Examination [ ].

3= don't know [ ]. 4= other (specify)**……**

9. Have you ever heard of HIV Counseling and Testing?

1=Yes [ ].

2= No [ ]……,**If 'No' skip 10 and 11 and go to 12.**

10. Where did you get the information about HIV Counseling and Testing? Choose only one.

1= Radio [ ].

2= Health worker [ ].

3= Relative [ ].

4=Straight talks [ ]. 5= other (specify)…….

11. What do you know about HIV Counseling and Testing?

1= Testing for HIV when someone forces you to do so [ ]

2= Going for an HIV test after making a decision on your own [ ]

3= Reveling secret that is hidden

12. Do you know of any place in Bunkure where you can go and have HIV test?

1=Yes [ ]. 2= No [ ]……**If 'No' skip 13,14 and go to No. 15**.

13. How did you know about the place?

1=Health worker [ ].

2=Friends [ ].

3= Radio

4= other (specify)…….

14. What is the distance from your home to the nearest HIV testing site?

1= <5km [ ].

2= 5-10km [ ].

3= > 10 km [ ].

15. Do you know the benefits of having HIV test?

1=Yes [ ]

2=No [**]** **if "No" skip 16 and go to 17**

16. What benefits does a person get in going for HIV Counseling and Testing? Tick only one option

1= People who test positive can make decision on various alternatives regarding treatment [ ].

2 = Effective at preventing spread from those who are positive to their wives/husband and their new born children [ ]. .

3= It also enables positive living through referral to social groups and peer support groups [ ]. .

4=Increases community awareness about HIV. [ ]

5= Reducing stigma among HIV/AIDS people.[ ]

6= Helps plan for future [ ]

17. Have you been previously tested?

1=Yes [ ] 2=No [ ]……..**If 'No' skip 18, 19, 20 and go to 21**

18. How long did you take while at the testing health facility?

1= < 1 hour [ ]

2= 1- 2 hours [ ]

3= >2hours [ ]

19. Did you pay any money for the service offered?

1=Yes [ ] 2=No [ ]

20. What was the reason/s for the response in (17) above?

……

II-Attitudes on uptake of HCT

21. Would you be willing to have a HIV test carried out based on Health practitioner's request?

1=Yes [ ] 2=No [ ]

22. Do you think all adult people should have HIV test ?

1= Yes [ ] 2= No [ ]

3= I don't know [ ]

2) Community factors affecting uptake of HCT

23. Do you think people in Bunkure would be willing to have HIV test carried out?

1=Yes[ ] 2=No [ ]

24. What reasons in the community do you think will prevent people from uptake of HIV test?

Cultural beliefs (HIV is spiritual illness) 1= Yes [ ] 2= No [ ]

Stigmatization (People will discriminate you) 1= Yes [ ] 2= No [ ]

Fear of the test (that it may expose your status) 1= Yes [ ] 2= No [ ]

Misconception (HIV is a disease of white man) 1= Yes [ ] 2= No [ ]

25. Has Health education on HIV test been ever conducted in your community?

1= Yes [ ] 2= No = [ ] **if No skip 26 and go to 27**

26. If yes how many times during the past 2 years

a- once [ ]

b- Twice [ ]

c- Three times or more [ ]

3) Health facility barriers affecting uptake of HCT

27. Do you think the services offered at your clinics sites encourage clients to get involved in HIV testing services?

1= Yes [ ] 2= No [ ]

28. What reasons in the health facility do you think will prevent people from uptake of HIV test?

Location of the services 1= Yes [ ] 2= No [ ]

Distance of the health facility 1= Yes [ ] 2= No [ ]

Confidentiality of the test in health facility 1= Yes [ ] 2= No [ ]

Attitudes of health workers 1= Yes [ ] 2= No [ ]

others (specify)…….

29. What suggestions would you give to improve HIV testing services uptake in Bunkure?

.....

Consent form; Participant information (English version)

DEPARTMENT OF COMMUNITY MEDICINE,
AHMADU BELLO UNIVERSITY, ZARIA

Research on Factors Affecting Uptake of HIV Counseling and Testing Among Adults in Bunkure Kano State

My name is Aliyu Shehu Ibrahim, a final year student from Department of Community Medicine, Ahmadu Bello University Zaria. I am conducting a study on the factors affecting uptake of HIV Counseling and Testing among adults in Bunkure Local Government Area Kano state, for the purpose of obtaining Master degree in the University. All the information would be confidential and would be used for academic purpose. Your sincere response would be highly appreciated as information obtained would be helpful in making recommendation to improve uptake of HIV Counseling and Testing in Bunkure, which will help in reducing the morbidity and mortality associated with HIV infection. As a participant, I would request that you respond to the research questionnaire which may take 20 minutes. If you agree to participate, kindly sign in the space provided below. Participation is entirely voluntary. Refusal to participate will not affect you or your spouse in any manner.

Consent obtained? Yes ☐ No ☐

Name of the participant: …… Sign/Thumb Print: ……

Date: ……

Name of the researcher : …… Signature: ……..……

If you have further questions:

Contact: Aliyu Shehu Ibrahim - Tel: 08131357505, Email aliyuibrahim2029@yahoo.com

Thank you very much.

Appendix 3 : Participant information (Hausa version)

SASHEN KULA DA LAFIYAR AL'UMMA

JAMI'AR AHMADU BELLO, ZARIA

BINCIKE AKAN YANAYI DA KE HANA YIN GWAJIN CUTAR DAKE KARYA GARKUWAR JIKI WATO "HIV TEST" A KARAMAR HUKUMAR BUNKURE, JIHAR KANO

KARI NA II

Gabatarwa:

Sunana Aliyu Shehu Ibrahim dalibi daga Jamiar Ahmadu Bello, Zaria. Ina yin bincike ne akan yanayindake hana yin gwajin cutar dake karya garkuwar jiki wato cutar "HIV" a nan Bunkure, domin samun damar karban Digiri na biyu a wannan jamiar mai suna a sama.

Wannan bincike na iya taimakawa mutanen Bunkure, su san matsayinsu game da kiyaye kamuwa da wannan cuta da kuma a rage yaduwarta da wahalhalu da mace mace da ya danganci wannan cuta a cikin alumma. Bayanan da aka amsa za a kiyayeshi amana, kuma ayi amfani dashi ta hanyar ilimantarwa. A matsayinka ko matsayinki, in ka /kin amince zamu yi maka/ki tambayoyi dake jikin takardun tambayoyinmu dazai kai kamar yan mintuna ashirin.

Shiga wannan bincike ganin dama ne. Kana da dammar ka shiga ko karka/ ki shiga cikin wannan bincike,. Idan baka shiga wannan bincike ba babu abinda zai tauye maka/miki na wata dama dakake/ kike samu.

Eh na amince ☐ **Aa ban amince ba** ☐

Idan ka ko kin amince: Suna…….

Ka sa hannu ko ka dangwala babban dan yatsa na dama anan/kwanan wata……

Sunan Mai bincike……Sa hannu da kwanan wata……

To, idan kana da tambaya, ka iya tuntuba ta wadannan lambobi kamar haka:
Aliyu Shehu Ibrahim – lambar waya: 08131357505, ko ta adireshin akwatin yanar gizo: aliyuibrahim2029@yahoo.com

ETHICAL CLEARANCE

KANO STATE

HOSPITALS MANAGEMENT BOARD

BOARD HEADQUARTER

P.M.B 3540, POST OFFICE ROAD, KANO

HMB/GEN/488/VOL. I

4/2/1437AH=16/11/2015

Aliyu Ibrahim Shehu
Dept. of Community Medicine,
Ahmadu Bello University Zaria.

PROVISIONAL ETHICAL CLEARANCE

Sequel to your request to conduct a research title **"Factors affecting Uptake of Premarital HIV Counseling and Testing among Adults in Bunkure LGA Kano State"** In the light of the above, I am mandated to convey provisional clearance to proceed on your study based on the following conditions.

i. That the consent of all participants must be obtained by filling in consent form.
ii. That you should liaise with the Management of the facility for appropriate guidance.
iii. That any publication related to the study should be brought to the knowledge of the Ethical Committee for approval.
iv. That a copy of your finding should be submitted for documentation, record and final approval, please.

Best regards.

HAFSA ABUBAKAR UMAR.
ASST. SEC. II
FOR: EXECUTIVE SECRETARY